

OGR



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# Chapter 1

## OGR Simple Feature Library

The OGR Simple Features Library is a C++ open source library (and commandline tools) providing read (and sometimes write) access to a variety of vector file formats including ESRI Shapefiles, S-57, SDTS, PostGIS, Oracle Spatial, and Mapinfo mid/mif and TAB formats.

OGR is a part of the GDAL library.

### Resources

- [OGR Supported Formats](#)
- [OGR Utility Programs](#)
- [OGR Class Documentation](#)
- [OGR C++ API Read/Write Tutorial](#)
- [OGR Driver Implementation Tutorial](#)
- [ogr\\_api.h: OGR C API](#)
- [OGR Projections Tutorial](#)
- [OGR Architecture](#)
- [OGR SQL](#)
- [OGR - Feature Style Specification](#)
- [SFC \(OLE DB client side API\) Tutorial](#)
- [Adam's 2.5 D Simple Features Proposal \(OGC 99-402r2\)](#)
- [Adam's SRS WKT Clarification Proposal in html or doc format.](#)

### Download

#### Ready to Use Executables

The best way to get OGR utilities in ready-to-use form is to download the latest FWTools kit for your platform. While large, these include builds of the OGR utilities with lots of optional components built-in. Once downloaded follow the included instructions to setup your path and other environment variables

correctly, and then you can use the various OGR utilities from the command line. The kits also include OpenEV, a viewer that will display OGR supported vector files.

### Source

The source code for this effort is intended to be available as OpenSource using an X Consortium style license. The OGR library is currently a loosely coupled subcomponent of the GDAL library, so you get all of GDAL for the "price" of OGR. See the [GDAL Download](#) and [Building](#) pages for details on getting the source and building it.

### Bug Reporting

GDAL/OGR bugs can be reported, and can be listed using Trac.

### Mailing Lists

A `gdal-announce` mailing list subscription is a low volume way of keeping track of major developments with the GDAL/OGR project.

The `gdal-dev@lists.maptools.org` mailing list can be used for discussion of development and user issues related to OGR and related technologies. Subscriptions can be done, and archives reviewed on the web.

### Alternative Bindings for the OGR API

In addition to the C++ API primarily addressed in the online documentation, there is also a slightly less complete C API implemented on top of the C++ API, and access available from Python.

The C API is primarily intended to provide a less fragile API since slight changes in the C++ API (such as const correctness changes) can cause changes in method and class signatures that prevent use of new DLLs with older clients. The C API is also generally easy to call from other languages which allow call out to DLLs functions, such as Visual Basic, or Delphi. The API can be explored in the `ogr_api.h` include file. The `gdal/ogr/ogr_capi_test.c` is a small sample program demonstrating use of the C API.

The Python API isn't really well documented at this time, but parallels the C/C++ APIs. The interface classes can be browsed in the `pymod/ogr.py` (simple features) and `pymod/osr.py` (coordinate systems) python modules. The `pymod/samples/assemblepoly.py` sample script is one demonstration of using the python API.

---

## **Chapter 2**

# **OGR API Tutorial**

This document is intended to document using the OGR C++ classes to read and write data from a file. It is strongly advised that the read first review the `OGR Architecture` document describing the key classes and their roles in OGR.

## 2.1 Reading From OGR

For purposes of demonstrating reading with OGR, we will construct a small utility for dumping point layers from an OGR data source to stdout in comma-delimited format.

Initially it is necessary to register all the format drivers that are desired. This is normally accomplished by calling **OGRRegisterAll()** (p. 383) which registers all format drivers built into GDAL/OGR.

```
#include "ogrsf_frmts.h"

int main()
{
    OGRRegisterAll();
```

Next we need to open the input OGR datasource. Datasources can be files, RDBMSes, directories full of files, or even remote web services depending on the driver being used. However, the datasource name is always a single string. In this case we are hardcoded to open a particular shapefile. The second argument (`FALSE`) tells the **OGRSFDriverRegistrar::Open()** (p. 215) method that we don't require update access. On failure `NULL` is returned, and we report an error.

```
OGRDataSource      *poDS;

poDS = OGRSFDriverRegistrar::Open( "point.shp", FALSE );
if( poDS == NULL )
{
    printf( "Open failed.\n" );
    exit( 1 );
}
```

An **OGRDataSource** (p. 90) can potentially have many layers associated with it. The number of layers available can be queried with **OGRDataSource::GetLayerCount()** (p. 93) and individual layers fetched by index using **OGRDataSource::GetLayer()** (p. 93). However, we will just fetch the layer by name.

```
OGLayer *poLayer;

poLayer = poDS->GetLayerByName( "point" );
```

Now we want to start reading features from the layer. Before we start we could assign an attribute or spatial filter to the layer to restrict the set of feature we get back, but for now we are interested in getting all features.

While it isn't strictly necessary in this circumstance since we are starting fresh with the layer, it is often wise to call **OGLayer::ResetReading()** (p. 162) to ensure we are starting at the beginning of the layer. We iterate through all the features in the layer using **OGLayer::GetNextFeature()** (p. 161). It will return `NULL` when we run out of features.

```
OGRFeature *poFeature;

poLayer->ResetReading();
while( (poFeature = poLayer->GetNextFeature()) != NULL )
{
```

---

In order to dump all the attribute fields of the feature, it is helpful to get the **OGRFeatureDefn** (p. 113). This is an object, associated with the layer, containing the definitions of all the fields. We loop over all the fields, and fetch and report the attributes based on their type.

```
OGRFeatureDefn *poFDefn = poLayer->GetLayerDefn();
int iField;

for( iField = 0; iField < poFDefn->GetFieldCount(); iField++ )
{
    OGRFieldDefn *poFieldDefn = poFDefn->GetFieldDefn( iField );

    if( poFieldDefn->GetType() == OFTInteger )
        printf( "%d,", poFeature->GetFieldAsInteger( iField ) );
    else if( poFieldDefn->GetType() == OFTReal )
        printf( "%.3f,", poFeature->GetFieldAsDouble(iField) );
    else if( poFieldDefn->GetType() == OFTString )
        printf( "%s,", poFeature->GetFieldAsString(iField) );
    else
        printf( "%s,", poFeature->GetFieldAsString(iField) );
}
```

There are a few more field types than those explicitly handled above, but a reasonable representation of them can be fetched with the **OGRFeature::GetFieldAsString()** (p. 104) method. In fact we could shorten the above by using **OGRFeature::GetFieldAsString()** (p. 104) for all the types.

Next we want to extract the geometry from the feature, and write out the point geometry x and y. Geometries are returned as a generic **OGRGeometry** (p. 124) pointer. We then determine the specific geometry type, and if it is a point, we cast it to point and operate on it. If it is something else we write placeholders.

```
OGRGeometry *poGeometry;

poGeometry = poFeature->GetGeometryRef();
if( poGeometry != NULL
    && wkbFlatten(poGeometry->getGeometryType()) == wkbPoint )
{
    OGRPoint *poPoint = (OGRPoint *) poGeometry;

    printf( "%.3f,%.3f\n", poPoint->getX(), poPoint->getY() );
}
else
{
    printf( "no point geometry\n" );
}
```

The **wkbFlatten()** macro is used above to convert the type for a **wkbPoint25D** (a point with a z coordinate) into the base 2D geometry type code (**wkbPoint**). For each 2D geometry type there is a corresponding 2.5D type code; however, there is only a C++ class for both the 2D and 3D cases. So our code will handle 2D or 3D cases properly.

Note that **OGRFeature::GetGeometryRef()** (p. 106) returns a pointer to the internal geometry owned by the **OGRFeature** (p. 99). There we don't actually deleted the return geometry. However, the **OGR-Layer::GetNextFeature()** (p. 161) method returns a copy of the feature that is now owned by us. So at the end of use we must free the feature. We could just "delete" it, but this can cause problems in windows builds where the GDAL DLL has a different "heap" from the main program. To be on the safe side we use a GDAL function to delete the feature.

```
OGRFeature::DestroyFeature( poFeature );
}
```

The **OGRLayer** (p. 156) returned by **OGRDataSource::GetLayerByName()** (p. 93) is also a reference to an internal layer owned by the **OGRDataSource** (p. 90) so we don't need to delete it. But we do need to

delete the datasource in order to close the input file. Once again we do this with a custom delete method to avoid special win32 heap issues.

```
OGRDataSource::DestroyDataSource( poDS );
}
```

All together our program looks like this.

```
#include "ogr_sfrmts.h"

int main()
{
    OGRRegisterAll();

    OGRDataSource      *poDS;

    poDS = OGRSFDriverRegistrar::Open( "point.shp", FALSE );
    if( poDS == NULL )
    {
        printf( "Open failed.\n" );
        exit( 1 );
    }

    OGRLayer *poLayer;

    poLayer = poDS->GetLayerByName( "point" );

    OGRFeature *poFeature;

    poLayer->ResetReading();
    while( (poFeature = poLayer->GetNextFeature()) != NULL )
    {
        OGRFeatureDefn *poFDefn = poLayer->GetLayerDefn();
        int iField;

        for( iField = 0; iField < poFDefn->GetFieldCount(); iField++ )
        {
            OGRFieldDefn *poFieldDefn = poFDefn->GetFieldDefn( iField );

            if( poFieldDefn->GetType() == OFTInteger )
                printf( "%d,", poFeature->GetFieldAsInteger( iField ) );
            else if( poFieldDefn->GetType() == OFTReal )
                printf( "%.3f,", poFeature->GetFieldAsDouble(iField) );
            else if( poFieldDefn->GetType() == OFTString )
                printf( "%s,", poFeature->GetFieldAsString(iField) );
            else
                printf( "%s,", poFeature->GetFieldAsString(iField) );
        }

        OGRGeometry *poGeometry;

        poGeometry = poFeature->GetGeometryRef();
        if( poGeometry != NULL
            && wkbFlatten(poGeometry->getGeometryType()) == wkbPoint )
        {
            OGRPoint *poPoint = (OGRPoint *) poGeometry;

            printf( "%.3f,%3.f\n", poPoint->getX(), poPoint->getY() );
        }
        else
        {
            printf( "no point geometry\n" );
        }
        OGRFeature::DestroyFeature( poFeature );
    }
}
```

---

```
OGRDataSource::DestroyDataSource( poDS );
}
```

## 2.2 Writing To OGR

As an example of writing through OGR, we will do roughly the opposite of the above. A short program that reads comma separated values from input text will be written to a point shapefile via OGR.

As usual, we start by registering all the drivers, and then fetch the Shapefile driver as we will need it to create our output file.

```
#include "ogr_sfc_frmts.h"

int main()
{
    const char *pszDriverName = "ESRI Shapefile";
    OGRSFDriver *poDriver;

    OGRRegisterAll();

    poDriver = OGRSFDriverRegistrar::GetRegistrar()->GetDriverByName(
        pszDriverName );
    if( poDriver == NULL )
    {
        printf( "%s driver not available.\n", pszDriverName );
        exit( 1 );
    }
}
```

Next we create the datasource. The ESRI Shapefile driver allows us to create a directory full of shapefiles, or a single shapefile as a datasource. In this case we will explicitly create a single file by including the extension in the name. Other drivers behave differently. The second argument to the call is a list of option values, but we will just be using defaults in this case. Details of the options supported are also format specific.

```
OGRDataSource *poDS;

poDS = poDriver->CreateDataSource( "point_out.shp", NULL );
if( poDS == NULL )
{
    printf( "Creation of output file failed.\n" );
    exit( 1 );
}
```

Now we create the output layer. In this case since the datasource is a single file, we can only have one layer. We pass `wkbPoint` to specify the type of geometry supported by this layer. In this case we aren't passing any coordinate system information or other special layer creation options.

```
OGRLayer *poLayer;

poLayer = poDS->CreateLayer( "point_out", NULL, wkbPoint, NULL );
if( poLayer == NULL )
{
    printf( "Layer creation failed.\n" );
    exit( 1 );
}
```

Now that the layer exists, we need to create any attribute fields that should appear on the layer. Fields must be added to the layer before any features are written. To create a field we initialize an **OGRField**

(p. 118) object with the information about the field. In the case of Shapefiles, the field width and precision is significant in the creation of the output .dbf file, so we set it specifically, though generally the defaults are OK. For this example we will just have one attribute, a name string associated with the x,y point.

Note that the template **OGRField** (p. 118) we pass to `CreateField()` is copied internally. We retain ownership of the object.

```
OGRFieldDefn oField( "Name", OFTString );

oField.SetWidth(32);

if( poLayer->CreateField( &oField ) != OGRERR_NONE )
{
    printf( "Creating Name field failed.\n" );
    exit( 1 );
}
\endcode
```

The following snippet loops reading lines of the form "x,y,name" from stdin, and parsing them.

```
\code
double x, y;
char szName[33];

while( !feof(stdin)
    && fscanf( stdin, "%lf,%lf,%32s", &x, &y, szName ) == 3 )
{
\endcode
```

To write a feature to disk, we must create a local **OGRFeature** (p. 99), set attributes and attach geometry before trying to write it to the layer. It is imperative that this feature be instantiated from the **OGRFeatureDefn** (p. 113) associated with the layer it will be written to.

```
OGRFeature *poFeature;

poFeature = OGRFeature::CreateFeature( poLayer->GetLayerDefn() );
poFeature->SetField( "Name", szName );
```

We create a local geometry object, and assign its copy (indirectly) to the feature. The **OGRFeature::SetGeometryDirectly()** (p. 111) differs from **OGRFeature::SetGeometry()** (p. 111) in that the direct method gives ownership of the geometry to the feature. This is generally more efficient as it avoids an extra deep object copy of the geometry.

```
OGRPoint pt;
pt.setX( x );
pt.setY( y );

poFeature->SetGeometry( &pt );
```

Now we create a feature in the file. The **OGRLayer::CreateFeature()** (p. 156) does not take ownership of our feature so we clean it up when done with it.

```
if( poLayer->CreateFeature( poFeature ) != OGRERR_NONE )
{
    printf( "Failed to create feature in shapefile.\n" );
    exit( 1 );
}

OGRFeature::DestroyFeature( poFeature );
}
```

---

Finally we need to close down the datasource in order to ensure headers are written out in an orderly way and all resources are recovered.

```
OGRDataSource::DestroyDataSource( poDS );  
}
```

The same program all in one block looks like this:

```
#include "ogrsgf_frmts.h"  
  
int main()  
{  
    const char *pszDriverName = "ESRI Shapefile";  
    OGRSFDriver *poDriver;  
  
    OGRRegisterAll();  
  
    poDriver = OGRSFDriverRegistrar::GetRegistrar()->GetDriverByName(  
        pszDriverName );  
    if( poDriver == NULL )  
    {  
        printf( "%s driver not available.\n", pszDriverName );  
        exit( 1 );  
    }  
  
    OGRDataSource *poDS;  
  
    poDS = poDriver->CreateDataSource( "point_out.shp", NULL );  
    if( poDS == NULL )  
    {  
        printf( "Creation of output file failed.\n" );  
        exit( 1 );  
    }  
  
    OGRLayer *poLayer;  
  
    poLayer = poDS->CreateLayer( "point_out", NULL, wkbPoint, NULL );  
    if( poLayer == NULL )  
    {  
        printf( "Layer creation failed.\n" );  
        exit( 1 );  
    }  
  
    OGRFieldDefn oField( "Name", OFTString );  
  
    oField.SetWidth(32);  
  
    if( poLayer->CreateField( &oField ) != OGRERR_NONE )  
    {  
        printf( "Creating Name field failed.\n" );  
        exit( 1 );  
    }  
  
    double x, y;  
    char szName[33];  
  
    while( !feof(stdin)  
        && fscanf( stdin, "%lf,%lf,%32s", &x, &y, szName ) == 3 )  
    {  
        OGRFeature *poFeature;  
  
        poFeature = OGRFeature::CreateFeature( poLayer->GetLayerDefn() );  
        poFeature->SetField( "Name", szName );  
  
        OGRPoint pt;
```

---

```
pt.setX( x );
pt.setY( y );

poFeature->SetGeometry( &pt );

if( poLayer->CreateFeature( poFeature ) != OGRERR_NONE )
{
    printf( "Failed to create feature in shapefile.\n" );
    exit( 1 );
}

    OGRFeature::DestroyFeature( poFeature );
}

OGRDataSource::DestroyDataSource( poDS );
}
```

---

## **Chapter 3**

# **OGR Architecture**

This document is intended to document the OGR classes. The OGR classes are intended to be generic (not specific to OLE DB or COM or Windows) but are used as a foundation for implementing OLE DB Provider support, as well as client side support for SFCOM. It is intended that these same OGR classes could be used by an implementation of SFCORBA for instance or used directly by C++ programs wanting to use an OpenGIS simple features inspired API.

Because OGR is modelled on the OpenGIS simple features data model, it is very helpful to review the SFCOM, or other simple features interface specifications which can be retrieved from the [Open GIS Consortium](#) web site. Data types, and method names are modelled on those from the interface specifications.

### 3.1 Class Overview

- **Geometry** (`ogr_geometry.h`): The geometry classes (**OGRGeometry** (p. 124), etc) encapsulate the OpenGIS model vector data as well as providing some geometry operations, and translation to/from well known binary and text format. A geometry includes a spatial reference system (projection).
- **Spatial Reference** (`ogr_spatialref.h`): An **OGRSpatialReference** (p. 217) encapsulates the definition of a projection and datum.
- **Feature** (`ogr_feature.h`): The **OGRFeature** (p. 99) encapsulate the definition of a whole feature, that is a geometry and a set of attributes.
- **Feature Class Definition** (`ogr_feature.h`): The **OGRFeatureDefn** (p. 113) class captures the schema (set of field definitions) for a group of related features (normally a whole layer).
- **Layer** (`ogrsgf_frmts.h`): **OGRLayer** (p. 156) is an abstract base class represent a layer of features in an **OGRDataSource** (p. 90).
- **Data Source** (`ogrsgf_frmts.h`): An **OGRDataSource** (p. 90) is an abstract base class representing a file or database containing one or more **OGRLayer** (p. 156) objects.
- **Drivers** (`ogrsgf_frmts.h`): An **OGRSFDriver** (p. 211) represents a translator for a specific format, opening **OGRDataSource** (p. 90) objects. All available drivers are managed by the **OGRSFDriverRegistrar** (p. 214).

### 3.2 Geometry

The geometry classes are represent various kinds of vector geometry. All the geometry classes derived from **OGRGeometry** (p. 124) which defines the common services of all geometries. Types of geometry include **OGRPoint** (p. 193), **OGRLineString** (p. 171), **OGRPolygon** (p. 201), **OGRGeometryCollection** (p. 141), **OGRMultiPolygon** (p. 189), **OGRMultiPoint** (p. 186), and **OGRMultiLineString** (p. 183).

Additional intermediate abstract base classes contain functionality that could eventually be implemented by other geometry types. These include **OGRCurve** (p. 88) (base class for **OGRLineString** (p. 171)) and **OGRSurface** (p. 260) (base class for **OGRPolygon** (p. 201)). Some intermediate interfaces modelled in the simple features abstract model and SFCOM are not modelled in OGR at this time. In most cases the methods are aggregated into other classes. This may change.

The **OGRGeometryFactory** (p. 151) is used to convert well known text, and well known binary format data into geometries. These are predefined ascii and binary formats for representing all the types of simple features geometries.

---

In a manner based on the geometry object in SFCOM, the **OGRGeometry** (p. 124) includes a reference to an **OGRSpatialReference** (p. 217) object, defining the spatial reference system of that geometry. This is normally a reference to a shared spatial reference object with reference counting for each of the **OGRGeometry** (p. 124) objects using it.

Many of the spatial analysis methods (such as computing overlaps and so forth) are not implemented at this time for **OGRGeometry** (p. 124).

While it is theoretically possible to derive other or more specific geometry classes from the existing **OGRGeometry** (p. 124) classes, this isn't as aspect that has been well thought out. In particular, it would be possible to create specialized classes using the **OGRGeometryFactory** (p. 151) without modifying it.

### 3.3 Spatial Reference

The **OGRSpatialReference** (p. 217) class is intended to store an OpenGIS Spatial Reference System definition. Currently local, geographic and projected coordinate systems are supported. Vertical coordinate systems, geocentric coordinate systems, and compound (horizontal + vertical) coordinate systems are not supported.

The spatial coordinate system data model is inherited from the OpenGIS **Well Known Text** format. A simple form of this is defined in the Simple Features specifications. A more sophisticated form is found in the Coordinate Transformation specification. The **OGRSpatialReference** (p. 217) is built on the features of the Coordinate Transformation specification but is intended to be compatible with the earlier simple features form.

There is also an associated **OGRCoordinateTransformation** (p. 86) class that encapsulates use of PROJ.4 for converting between different coordinate systems. There is a [tutorial](#) available describing how to use the **OGRSpatialReference** (p. 217) class.

### 3.4 Feature / Feature Definition

The **OGRGeometry** (p. 124) captures the geometry of a vector feature ... the spatial position/region of a feature. The **OGRFeature** (p. 99) contains this geometry, and adds feature attributes, feature id, and a feature class identify.

The set of attributes, their types, names and so forth is represented via the **OGRFeatureDefn** (p. 113) class. One **OGRFeatureDefn** (p. 113) normally exists for a layer of features. The same definition is shared in a reference counted manner by the feature of that type (or feature class).

The feature id (FID) of a feature is intended to be a unique identifier for the feature within the layer it is a member of. Freestanding features, or features not yet written to a layer may have a null (**OGRNullFID**) feature id. The feature ids are modelled in OGR as a long integer; however, this is not sufficiently expressive to model the natural feature ids in some formats. For instance, the GML feature id is a string, and the row id in Oracle is larger than 4 bytes.

The feature class also contains an indicator of the types of geometry allowed for that feature class (returned as an **OGRwkbGeometryType** from **OGRFeatureDefn::GetGeomType()** (p. 115)). If this is **wkbUnknown** then any type of geometry is allowed. This implies that features in a given layer can potentially be of different geometry types though they will always share a common attribute schema.

The **OGRFeatureDefn** (p. 113) also contains a concept of default spatial reference system for all features of that type and a feature class name (normally used as a layer name).

---

### 3.5 Layer

An **OGRLayer** (p. 156) represents a layer of features within a data source. All features in an **OGRLayer** (p. 156) share a common schema and are of the same **OGRFeatureDefn** (p. 113). An **OGRLayer** (p. 156) class also contains methods for reading features from the data source. The **OGRLayer** (p. 156) can be thought of as a gateway for reading and writing features from an underlying data source, normally a file format. In SFCOM and other table based simple features implementation an **OGRLayer** (p. 156) represents a spatial table.

The **OGRLayer** (p. 156) includes methods for sequential and random reading and writing. Read access (via the **OGRLayer::GetNextFeature()** (p. 161) method) normally reads all features, one at a time sequentially; however, it can be limited to return features intersecting a particular geographic region by installing a spatial filter on the **OGRLayer** (p. 156) (via the **OGRLayer::SetSpatialFilter()** (p. 163) method).

One flaw in the current OGR architecture is that the spatial filter is set directly on the **OGRLayer** (p. 156) which is intended to be the only representative of a given layer in a data source. This means it isn't possible to have multiple read operations active at one time with different spatial filters on each. This aspect may be revised in the future to introduce an **OGRLayerView** class or something similar.

Another question that might arise is why the **OGRLayer** (p. 156) and **OGRFeatureDefn** (p. 113) classes are distinct. An **OGRLayer** (p. 156) always has a one-to-one relationship to an **OGRFeatureDefn** (p. 113), so why not amalgamate the classes. There are two reasons:

1. As defined now **OGRFeature** (p. 99) and **OGRFeatureDefn** (p. 113) don't depend on **OGRLayer** (p. 156), so they can exist independently in memory without regard to a particular layer in a data store.
2. The SF CORBA model does not have a concept of a layer with a single fixed schema the way that the SFCOM and SFSQL models do. The fact that features belong to a feature collection that is potentially not directly related to their current feature grouping may be important to implementing SFCORBA support using OGR.

The **OGRLayer** (p. 156) class is an abstract base class. An implementation is expected to be subclassed for each file format driver implemented. **OGRLayers** are normally owned directly by their **OGRDataSource** (p. 90), and aren't instantiated or destroyed directly.

### 3.6 Data Source

An **OGRDataSource** (p. 90) represents a set of **OGRLayer** (p. 156) objects. This usually represents a single file, set of files, database or gateway. An **OGRDataSource** (p. 90) has a list of **OGRLayer**'s which it owns but can return references to.

**OGRDataSource** (p. 90) is an abstract base class. An implementation is expected to be subclassed for each file format driver implemented. **OGRDataSource** (p. 90) objects are not normally instantiated directly but rather with the assistance of an **OGRSFDriver** (p. 211). Deleting an **OGRDataSource** (p. 90) closes access to the underlying persistent data source, but does not normally result in deletion of that file.

An **OGRDataSource** (p. 90) has a name (usually a filename) that can be used to reopen the data source with an **OGRSFDriver** (p. 211).

The **OGRDataSource** (p. 90) also has support for executing a datasource specific command, normally a form of SQL. This is accomplished via the **OGRDataSource::ExecuteSQL()** (p. 92) method. While some datasources (such as PostGIS and Oracle) pass the SQL through to an underlying database, OGR also includes support for evaluating a subset of the SQL SELECT statement against any datasource.

## 3.7 Drivers

An **OGRSFDriver** (p. 211) object is instantiated for each file format supported. The **OGRSFDriver** (p. 211) objects are registered with the **OGRSFDriverRegistrar** (p. 214), a singleton class that is normally used to open new data sources.

It is intended that a new **OGRSFDriver** (p. 211) derived class be implemented for each file format to be supported (along with a file format specific **OGRDataSource** (p. 90), and **OGRLayer** (p. 156) classes).

On application startup registration functions are normally called for each desired file format. These functions instantiate the appropriate **OGRSFDriver** (p. 211) objects, and register them with the **OGRSFDriverRegistrar** (p. 214). When a data source is to be opened, the registrar will normally try each **OGRSFDriver** (p. 211) in turn, until one succeeds, returning an **OGRDataSource** (p. 90) object.

It is not intended that the **OGRSFDriverRegistrar** (p. 214) be derived from.



## **Chapter 4**

# **OGR Driver Implementation Tutorial**

## 4.1 Overall Approach

In general new formats are added to OGR by implementing format specific drivers with subclasses of **OGRSFDriver** (p. 211), **OGRDataSource** (p. 90) and **OGRLayer** (p. 156). The **OGRSFDriver** (p. 211) subclass is registered with the **OGRSFDriverRegistrar** (p. 214) at runtime.

Before following this tutorial to implement an OGR driver, please review the [OGR Architecture document](#) carefully.

The tutorial will be based on implementing a simple ascii point format.

## 4.2 Contents

1. **Implementing OGRSFDriver** (p. 18)
2. **Basic Read Only Data Source** (p. 20)
3. **Read Only Layer** (p. 21)

## 4.3 Implementing OGRSFDriver

The format specific driver class is implemented as a subclass of **OGRSFDriver** (p. 211). One instance of the driver will normally be created, and registered with the **OGRSFDriverRegistrar**(). The instantiation of the driver is normally handled by a global C callable registration function, similar to the following placed in the same file as the driver class.

```
void RegisterOGRSPF()
{
    OGRSFDriverRegistrar::GetRegistrar()->RegisterDriver( new OGRSPFDriver );
}
```

The driver class declaration generally looks something like this for a format with read or read and update access (the **Open()** method), creation support (the **CreateDataSource()** method), and the ability to delete a datasource (the **DeleteDataSource()** method).

```
class OGRSPFDriver : public OGRSFDriver
{
public:
    ~OGRSPFDriver();

    const char *GetName();
    OGRDataSource *Open( const char *, int );
    OGRDataSource *CreateDataSource( const char *, char ** );
    OGRErr DeleteDataSource( const char *pszName );
    int TestCapability( const char * );
};
```

The constructor generally does nothing. The **OGRSFDriver::GetName()** (p. 212) method returns a static string with the name of the driver. This name is specified on the commandline when creating datasources so it is generally good to keep it short and without any special characters or spaces.

```
OGRSPFDriver::~OGRSPFDriver()
```

---

```

{
}

const char *OGRSPFDriver::GetName()
{
    return "SPF";
}

```

The `Open()` method is called by **OGRSFDriverRegistrar::Open()** (p.215), or from the C API **OGROpen()** (p.382). The **OGRSFDriver::Open()** (p.212) method should quietly return NULL if the passed filename is not of the format supported by the driver. If it is the target format, then a new **OGRDataSource** (p.90) object for the datasource should be returned.

It is common for the `Open()` method to be delegated to an `Open()` method on the actual format's **OGRDataSource** (p.90) class. In the case of the SPF format update in place is not supported, so we always fail if `bUpdate` is FALSE.

```

OGRDataSource *OGRSPFDriver::Open( const char * pszFilename, int bUpdate )
{
    if( bUpdate )
    {
        CPLError( CE_Failure, CPLE_OpenFailed,
            "Update access not supported by the SPF driver." );
        return NULL;
    }

    OGRSPFDataSource *poDS = new OGRSPFDataSource();

    if( !poDS->Open( pszFilename ) )
    {
        delete poDS;
        return NULL;
    }
    else
        return poDS;
}

```

In OGR the capabilities of drivers, datasources and layers are determined by calling `TestCapability()` on the various objects with names strings representing specific optional capabilities. For the driver the only two capabilities currently tested for are the ability to create datasources and to delete them. In our first pass as a read only SPF driver, these are both disabled. The default return value for unrecognised capabilities should always be FALSE, and the symbolic defines for capability names (defined in **ogr\_core.h** (p.384)) should be used instead of the literal strings to avoid typos.

```

int OGRSPFDriver::TestCapability( const char * pszCap )
{
    if( EQUAL(pszCap, ODrCCreateDataSource) )
        return FALSE;
    else if( EQUAL(pszCap, ODrCDeleteDataSource) )
        return FALSE;
    else
        return FALSE;
}

```

Examples of the `CreateDataSource()` and `DeleteDataSource()` methods are left for the section on creation and update.

---

## 4.4 Basic Read Only Data Source

We will start implementing a minimal read-only datasource. No attempt is made to optimize operations, and default implementations of many methods inherited from **OGRDataSource** (p. 90) are used.

The primary responsibility of the datasource is to manage the list of layers. In the case of the SPF format a datasource is a single file representing one layer so there is at most one layer. The "name" of a datasource should generally be the name passed to the `Open()` method.

The `Open()` method below is not overriding a base class method, but we have it to implement the open operation delegated by the driver class.

For this simple case we provide a stub `TestCapability()` that returns `FALSE` for all extended capabilities. The `TestCapability()` method is pure virtual, so it does need to be implemented.

```
class OGRSPFDataSource : public OGRDataSource
{
    char                *pszName;

    OGRSPFLayer        **papoLayers;
    int                 nLayers;

public:
    OGRSPFDataSource();
    ~OGRSPFDataSource();

    int                 Open( const char * pszFilename );

    const char          *GetName() { return pszName; }

    int                 GetLayerCount() { return nLayers; }
    OGRLayer            *GetLayer( int );

    int                 TestCapability( const char * ) { return FALSE; }
};
```

The constructor is a simple initializer to a default state. The `Open()` will take care of actually attaching it to a file. The destructor is responsible for orderly cleanup of layers.

```
OGRSPFDataSource::OGRSPFDataSource()
{
    papoLayers = NULL;
    nLayers = 0;

    pszName = NULL;
}

OGRSPFDataSource::~OGRSPFDataSource()
{
    for( int i = 0; i < nLayers; i++ )
        delete papoLayers[i];
    CPLFree( papoLayers );

    CPLFree( pszName );
}
```

The `Open()` method is the most important one on the datasource, though in this particular instance it passes most of it's work off to the `OGRSPFLayer` constructor if it believes the file is of the desired format.

Note that `Open()` methods should try and determine that a file isn't of the identified format as efficiently as possible, since many drivers may be invoked with files of the wrong format before the correct driver

---

is reached. In this particular `Open()` we just test the file extension but this is generally a poor way of identifying a file format. If available, checking "magic header values" or something similar is preferable.

```
int  OGRSPFDataSource::Open( const char *pszFilename )
{
// -----
//      Does this appear to be an .spf file?
// -----
    if( !EQUAL( CPLGetExtension(pszFilename), "spf" ) )
        return FALSE;

// -----
//      Create a corresponding layer.
// -----
    nLayers = 1;
    papoLayers = (OGRSPFLayer **) CPLMalloc(sizeof(void*));

    papoLayers[0] = new OGRSPFLayer( pszFilename );

    pszName = CPLStrdup( pszFilename );

    return TRUE;
}
```

A `GetLayer()` method also needs to be implemented. Since the layer list is created in the `Open()` this is just a lookup with some safety testing.

```
OGRLayer *OGRSPFDataSource::GetLayer( int iLayer )
{
    if( iLayer < 0 || iLayer >= nLayers )
        return NULL;
    else
        return papoLayers[iLayer];
}
```

## 4.5 Read Only Layer

The `OGRSPFLayer` implements layer semantics for an `.spf` file. It provides access to a set of feature objects in a consistent coordinate system with a particular set of attribute columns. Our class definition looks like this:

```
class OGRSPFLayer : public OGRLayer
{
    OGRFeatureDefn      *poFeatureDefn;

    FILE                *fp;

    int                 nNextFID;

public:
    OGRSPFLayer( const char *pszFilename );
    ~OGRSPFLayer();

    void                ResetReading();
    OGRFeature *        GetNextFeature();

    OGRFeatureDefn *    GetLayerDefn() { return poFeatureDefn; }

    int                 TestCapability( const char * ) { return FALSE; }
};
```

---

The layer constructor is responsible for initialization. The most important initialization is setting up the **OGRFeatureDefn** (p. 113) for the layer. This defines the list of fields and their types, the geometry type and the coordinate system for the layer. In the SPF format the set of fields is fixed - a single string field and we have no coordinate system info to set.

Pay particular attention to the reference counting of the **OGRFeatureDefn** (p. 113). As OGRFeature's for this layer will also take a reference to this definition it is important that we also establish a reference on behalf of the layer itself.

```
OGRSPFLayer::OGRSPFLayer( const char *pszFilename )

{
    nNextFID = 0;

    poFeatureDefn = new OGRFeatureDefn( CPLGetBasename( pszFilename ) );
    poFeatureDefn->Reference();
    poFeatureDefn->SetGeomType( wkbPoint );

    OGRFieldDefn oFieldTemplate( "Name", OFTString );

    poFeatureDefn->AddFieldDefn( &oFieldTemplate );

    fp = VSIFOpenL( pszFilename, "r" );
    if( fp == NULL )
        return;
}
```

Note that the destructor uses `Release()` on the **OGRFeatureDefn** (p. 113). This will destroy the feature definition if the reference count drops to zero, but if the application is still holding onto a feature from this layer, then that feature will hold a reference to the feature definition and it will not be destroyed here (which is good!).

```
OGRSPFLayer::~OGRSPFLayer()

{
    poFeatureDefn->Release();
    if( fp != NULL )
        VSIFCloseL( fp );
}
```

The `GetNextFeature()` method is usually the work horse of **OGRLayer** (p. 156) implementations. It is responsible for reading the next feature according to the current spatial and attribute filters installed.

The `while()` loop is present to loop until we find a satisfactory feature. The first section of code is for parsing a single line of the SPF text file and establishing the x, y and name for the line.

```
OGRFeature *OGRSPFLayer::GetNextFeature()

{
    // -----
    // Loop till we find a feature matching our requirements.
    // -----
    while( TRUE )
    {
        const char *pszLine;
        const char *pszName;

        pszLine = CPLReadLineL( fp );

        // Are we at end of file (out of features)?
        if( pszLine == NULL )
            return NULL;
    }
}
```

---

```

double dfX;
double dfY;

dfX = atof(pszLine);

pszLine = strstr(pszLine, "|");
if( pszLine == NULL )
    continue; // we should issue an error!
else
    pszLine++;

dfY = atof(pszLine);

pszLine = strstr(pszLine, "|");
if( pszLine == NULL )
    continue; // we should issue an error!
else
    pszName = pszLine+1;

```

The next section turns the x, y and name into a feature. Also note that we assign a linearly incremented feature id. In our case we started at zero for the first feature, though some drivers start at 1.

```

OGRFeature *poFeature = new OGRFeature( poFeatureDefn );

poFeature->SetGeometryDirectly( new OGRPoint( dfX, dfY ) );
poFeature->SetField( 0, pszName );
poFeature->SetFID( nNextFID++ );

```

Next we check if the feature matches our current attribute or spatial filter if we have them. Methods on the **OGRLayer** (p. 156) base class support maintain filters in the **OGRLayer** (p. 156) member fields `m_poFilterGeom` (spatial filter) and `m_poAttrQuery` (attribute filter) so we can just use these values here if they are non-NULL. The following test is essentially "stock" and done the same in all formats. Some formats also do some spatial filtering ahead of time using a spatial index.

If the feature meets our criteria we return it. Otherwise we destroy it, and return to the top of the loop to fetch another to try.

```

    if( (m_poFilterGeom == NULL
        || FilterGeometry( poFeature->GetGeometryRef() ) )
        && (m_poAttrQuery == NULL
            || m_poAttrQuery->Evaluate( poFeature ) ) )
        return poFeature;

    delete poFeature;
}

```

While in the middle of reading a feature set from a layer, or at any other time the application can call `ResetReading()` which is intended to restart reading at the beginning of the feature set. We implement this by seeking back to the beginning of the file, and resetting our feature id counter.

```

void OGRSPFLayer::ResetReading()
{
    VSIFSeekL( fp, 0, SEEK_SET );
    nNextFID = 0;
}

```

In this implementation we do not provide a custom implementation for the `GetFeature()` method. This means an attempt to read a particular feature by it's feature id will result in many calls to `GetNextFeature()`

till the desired feature is found. However, in a sequential text format like spf there is little else we could do anyways.

There! We have completed a simple read-only feature file format driver.

## **Chapter 5**

# **OGR SQL**

The **OGRDataSource** (p. 90) supports executing commands against a datasource via the **OGRDataSource::ExecuteSQL()** (p. 92) method. While in theory any sort of command could be handled this way, in practice the mechanism is used to provide a subset of SQL SELECT capability to applications. This page discusses the generic SQL implementation implemented within OGR, and issue with driver specific SQL support.

## 5.1 SELECT

The SELECT statement is used to fetch layer features (analogous to table rows in an RDBMS) with the result of the query represented as a temporary layer of features. The layers of the datasource are analogous to tables in an RDBMS and feature attributes are analogous to column values. The simplest form of OGR SQL SELECT statement looks like this:

```
SELECT * FROM polylayer
```

In this case all features are fetched from the layer named "polylayer", and all attributes of those features are returned. This is essentially equivalent to accessing the layer directly. In this example the "\*" is the list of fields to fetch from the layer, with "\*" meaning that all fields should be fetched.

This slightly more sophisticated form still pulls all features from the layer but the schema will only contain the EAS\_ID and PROP\_VALUE attributes. Any other attributes would be discarded.

```
SELECT eas_id, prop_value FROM polylayer
```

A much more ambitious SELECT, restricting the features fetched with a WHERE clause, and sorting the results might look like:

```
SELECT * from polylayer WHERE prop_value > 220000.0 ORDER BY prop_value DESC
```

This select statement will produce a table with just one feature, with one attribute (named something like "count\_eas\_id") containing the number of distinct values of the eas\_id attribute.

```
SELECT COUNT(DISTINCT eas_id) FROM polylayer
```

### 5.1.1 Field List Operators

The field list is a comma separate list of the fields to be carried into the output features from the source layer. They will appear on output features in the order they appear on in the field list, so the field list may be used to re-order the fields.

A special form of the field list uses the DISTINCT keyword. This returns a list of all the distinct values of the named attribute. When the DISTINCT keyword is used, only one attribute may appear in the field list. The DISTINCT keyword may be used against any type of field. Currently the distinctness test against a string value is case insensitive in OGR SQL. The result of a SELECT with a DISTINCT keyword is a layer with one column (named the same as the field operated on), and one feature per distinct value. Geometries are discarded. The distinct values are assembled in memory, so a lot of memory may be used for datasets with a large number of distinct values.

```
SELECT DISTINCT areacode FROM polylayer
```

---

There are also several summarization operators that may be applied to columns. When a summarization operator is applied to any field, then all fields must have summarization operators applied. The summarization operators are COUNT (a count of instances), AVG (numerical average), SUM (numerical sum), MIN (lexical or numerical minimum), and MAX (lexical or numerical maximum). This example produces a variety of summarization information on parcel property values:

```
SELECT MIN(prop_value), MAX(prop_value), AVG(prop_value), SUM(prop_value),
       COUNT(prop_value) FROM polylayer WHERE prov_name = "Ontario"
```

As a special case, the COUNT() operator can be given a "\*" argument instead of a field name which is a short form for count all the records though it would get the same result as giving it any of the column names. It is also possible to apply the COUNT() operator to a DISTINCT SELECT to get a count of distinct values, for instance:

```
SELECT COUNT(DISTINCT areacode) FROM polylayer
```

Field names can also be prefixed by a table name though this is only really meaningful when performing joins. It is further demonstrated in the JOIN section.

### 5.1.1.1 Field List Limitations

1. Field arithmetic, and other binary operators are not supported, so you can't do something like:

```
SELECT prop_value / area FROM invoices
```

2. There is no mechanism to rename a column. In fact, I don't even know how this is done in real SQL.
3. Lots of operators are missing.

## 5.1.2 WHERE

The argument to the WHERE clause is a fairly simplistic logical expression used select records to be selected from the source layer. In addition to its use within the WHERE statement, the WHERE clause handling is also used for OGR attribute queries on regular layers.

A WHERE clause consists of a set of attribute tests. Each basic test is of the form **fieldname operator value**. The **fieldname** is any of the fields in the source layer. The operator is one of =, !=, <>, <, >, <=, >=, **LIKE** and **ILIKE** and **IN**.

Most of the operators are self explanatory, but it is worth noting that != is the same as <>, the string equality is case insensitive, but the <, >, <= and >= operators *are* case sensitive. Both the LIKE and ILIKE operators are case insensitive.

The value argument to the **LIKE** operator is a pattern against which the value string is matched. In this pattern percent (%) matches any number of characters, and underscore ( \_ ) matches any one character.

String	Pattern	Matches?
-----	-----	-----
Alberta	ALB%	Yes
Alberta	_lberta	Yes
St. Alberta	_lberta	No
St. Alberta	%lberta	Yes
Robarts St.	%Robarts%	Yes
12345	123%45	Yes
123.45	12?45	No
N0N 1P0	%N0N%	Yes
L4C 5E2	%N0N%	No

The **IN** takes a list of values as it's argument and tests the attribute value for membership in the provided set.

Value	Value Set	Matches?
-----	-----	-----
321	IN (456,123)	No
"Ontario"	IN ("Ontario","BC")	Yes
"Ont"	IN ("Ontario","BC")	No
1	IN (0,2,4,6)	No

In addition to the above binary operators, there are additional operators for testing if a field is null or not. These are the **IS NULL** and **IS NOT NULL** operators.

Basic field tests can be combined in more complicated predicates using logical operators include **AND**, **OR**, and the unary logical **NOT**. Subexpressions should be bracketed to make precedence clear. Some more complicated predicates are:

```
SELECT * FROM poly WHERE (prop_value >= 100000) AND (prop_value < 200000)
SELECT * FROM poly WHERE NOT (area_code LIKE "N0N%")
SELECT * FROM poly WHERE (prop_value IS NOT NULL) AND (prop_value < 100000)
```

### 5.1.3 WHERE Limitations

1. The left of any comparison operator must be a field name, and the right must be a literal value. Fields cannot currently be compared to fields.
2. Fields must all come from the primary table (the one listed in the FROM clause, and must not have any table prefix ... they must just be the field name.
3. No arithmetic operations are supported. You can't test "WHERE (a+b) < 10" for instance.
4. All string comparisons are case insensitive except for <, >, <= and >=.

### 5.1.4 ORDER BY

The **ORDER BY** clause is used force the returned features to be reordered into sorted order (ascending or descending) on one of the field values. Ascending (increasing) order is the default if neither the ASC or DESC keyword is provided. For example:

```
SELECT * FROM property WHERE class_code = 7 ORDER BY prop_value DESC
SELECT * FROM property ORDER BY prop_value
SELECT * FROM property ORDER BY prop_value ASC
SELECT DISTINCT zip_code FROM property ORDER BY zip_code
```

Note that ORDER BY clauses cause two passes through the feature set. One to build an in-memory table of field values corresponded with feature ids, and a second pass to fetch the features by feature id in the sorted order. For formats which cannot efficiently randomly read features by feature id this can be a very expensive operation.

Sorting of string field values is case sensitive, not case insensitive like in most other parts of OGR SQL.

### 5.1.5 JOINS

OGR SQL supports a limited form of one to one JOIN. This allows records from a secondary table to be looked up based on a shared key between it and the primary table being queried. For instance, a table of

city locations might include a *nation\_id* column that can be used as a reference into a secondary *nation* table to fetch a nation name. A joined query might look like:

```
SELECT city.*, nation.name FROM city
LEFT JOIN nation ON city.nation_id = nation.id
```

This query would result in a table with all the fields from the city table, and an additional "nation.name" field with the nation name pulled from the nation table by looking for the record in the nation table that has the "id" field with the same value as the city.nation\_id field.

Joins introduce a number of additional issues. One is the concept of table qualifiers on field names. For instance, referring to city.nation\_id instead of just nation\_id to indicate the nation\_id field from the city layer. The table name qualifiers may only be used in the field list, and within the **ON** clause of the join.

Wildcards are also somewhat more involved. All fields from the primary table (*city* in this case) and the secondary table (*nation* in this case) may be selected using the usual \* wildcard. But the fields of just one of the primary or secondary table may be selected by prefixing the asterix with the table name.

The field names in the resulting query layer will be qualified by the table name, if the table name is given as a qualifier in the field list. In addition field names will be qualified with a table name if they would conflict with earlier fields. For instance, the following select would result might result in a results set with a *name*, *nation\_id*, *nation.nation\_id* and *nation.name* field if the city and nation tables both have the *nation\_id* and *name* fieldnames.

```
SELECT * FROM city LEFT JOIN nation ON city.nation_id = nation.nation_id
```

On the other hand if the nation table had a *continent\_id* field, but the city table did not, then that field would not need to be qualified in the result set. However, if the selected instead looked like the following statement, all result fields would be qualified by the table name.

```
SELECT city.*, nation.* FROM city
LEFT JOIN nation ON city.nation_id = nation.nation_id
```

In the above examples, the *nation* table was found in the same datasource as the *city* table. However, the OGR join support includes the ability to join against a table in a different data source, potentially of a different format. This is indicated by qualifying the secondary table name with a datasource name. In this case the secondary datasource is opened using normal OGR semantics and utilized to access the secondary table until the query result is no longer needed.

```
SELECT * FROM city
LEFT JOIN '/usr2/data/nation.dbf'.nation ON city.nation_id = nation.nation_id
```

While not necessarily very useful, it is also possible to introduce table aliases to simplify some SELECT statements. This can also be useful to disambiguate situations where tables of the same name are being used from different data sources. For instance, if the actual tables names were messy we might want to do something like:

```
SELECT c.name, n.name FROM project_615_city c
LEFT JOIN '/usr2/data/project_615_nation.dbf'.project_615_nation n
ON c.nation_id = n.nation_id
```

It is possible to do multiple joins in a single query.

```
SELECT city.name, prov.name, nation.name FROM city
LEFT JOIN province ON city.prov_id = province.id
LEFT JOIN nation ON city.nation_id = nation.id
```

### 5.1.6 JOIN Limitations

1. Joins can be very expensive operations if the secondary table is not indexed on the key field being used.
2. Joined fields may not be used in WHERE clauses, or ORDER BY clauses at this time. The join is essentially evaluated after all primary table subsetting is complete, and after the ORDER BY pass.
3. Joined fields may not be used as keys in later joins. So you could not use the province id in a city to lookup the province record, and then use a nation id from the province id to lookup the nation record. This is a sensible thing to want and could be implemented, but is not currently supported.
4. Datasource names for joined tables are evaluated relative to the current processes working directory, not the path to the primary datasource.
5. These are not true LEFT or RIGHT joins in the RDBMS sense. Whether or not a secondary record exists for the join key or not, one and only one copy of the primary record is returned in the result set. If a secondary record cannot be found, the secondary derived fields will be NULL. If more than one matching secondary field is found only the first will be used.

## 5.2 SPECIAL FIELDS

The OGR SQL query processor treats some of the attributes of the features as built-in special fields can be used in the SQL statements likewise the other fields. These fields can be placed in the select list, the WHERE clause and the ORDER BY clause respectively. The special field will not be included in the result by default but it may be explicitly included by adding it to the select list. When accessing the field values the special fields will take precedence over the other fields with the same names in the data source.

### 5.2.1 FID

Normally the feature id is a special property of a feature and not treated as an attribute of the feature. In some cases it is convenient to be able to utilize the feature id in queries and result sets as a regular field. To do so use the name **FID**. The field wildcard expansions will not include the feature id, but it may be explicitly included using a syntax like:

```
SELECT FID, * FROM nation
```

### 5.2.2 OGR\_GEOMETRY

Some of the data sources (like MapInfo tab) can handle geometries of different types within the same layer. The **OGR\_GEOMETRY** special field represents the geometry type returned by **OGRGeometry::getGeometryName()** (p. 132) and can be used to distinguish the various types. By using this field one can select particular types of the geometries like:

```
SELECT * FROM nation WHERE OGR_GEOMETRY='POINT' OR OGR_GEOMETRY='POLYGON'
```

### 5.2.3 OGR\_GEOM\_WKT

The Well Known Text representation of the geometry can also be used as a special field. To select the WKT of the geometry **OGR\_GEOM\_WKT** might be included in the select list, like:

---

```
SELECT OGR_GEOM_WKT, * FROM nation
```

Using the **OGR\_GEOM\_WKT** and the **LIKE** operator in the WHERE clause we can get similar effect as using **OGR\_GEOMETRY**:

```
SELECT OGR_GEOM_WKT, * FROM nation WHERE OGR_GEOM_WKT  
LIKE 'POINT%' OR OGR_GEOM_WKT LIKE 'POLYGON%'
```

### 5.2.4 OGR\_STYLE

The **OGR\_STYLE** special field represents the style string of the feature returned by **OGRFeature::GetStyleString()** (p. 107). By using this field and the **LIKE** operator the result of the query can be filtered by the style. For example we can select the annotation features as:

```
SELECT * FROM nation WHERE OGR_STYLE LIKE 'LABEL%'
```

## 5.3 CREATE INDEX

Some OGR SQL drivers support creating of attribute indexes. Currently this includes the Shapefile driver. An index accelerates very simple attribute queries of the form *fieldname = value*, which is what is used by the **JOIN** capability. To create an attribute index on the *nation\_id* field of the *nation* table a command like this would be used:

```
CREATE INDEX ON nation USING nation_id
```

### 5.3.1 Index Limitations

1. Indexes are not maintained dynamically when new features are added to or removed from a layer.
2. Very long strings (longer than 256 characters?) cannot currently be indexed.
3. To recreate an index it is necessary to drop all indexes on a layer and then recreate all the indexes.
4. Indexes are not used in any complex queries. Currently the only query they will accelerate is a simple "field = value" query.

## 5.4 DROP INDEX

The OGR SQL **DROP INDEX** command can be used to drop all indexes on a particular table, or just the index for a particular column.

```
DROP INDEX ON nation USING nation_id  
DROP INDEX ON nation
```

## 5.5 ExecuteSQL()

SQL is executed against an **OGRDataSource** (p. 90), not against a specific layer. The call looks like this:

---

```
OGRLayer * OGRDataSource::ExecuteSQL( const char *pszSQLCommand,  
                                       OGRGeometry *poSpatialFilter,  
                                       const char *pszDialect );
```

The `pszDialect` argument is in theory intended to allow for support of different command languages against a provider, but for now applications should always pass an empty (not NULL) string to get the default dialect.

The `poSpatialFilter` argument is a geometry used to select a bounding rectangle for features to be returned in a manner similar to the **OGRLayer::SetSpatialFilter()** (p. 163) method. It may be NULL for no special spatial restriction.

The result of an `ExecuteSQL()` call is usually a temporary **OGRLayer** (p. 156) representing the results set from the statement. This is the case for a `SELECT` statement for instance. The returned temporary layer should be released with `OGRDataSource::ReleaseResultSet()` method when no longer needed. Failure to release it before the datasource is destroyed may result in a crash.

## 5.6 Non-OGR SQL

All OGR drivers for database systems: MySQL, PostgreSQL and PostGIS (PG), Oracle (OCI), SQLite, ODBC and ESRI Personal Geodatabase (PGeo) override the **OGRDataSource::ExecuteSQL()** (p. 92) function with dedicated implementation and, by default, pass the SQL statements directly to the underlying RDBMS. In these cases the SQL syntax varies in some particulars from OGR SQL. Also, anything possible in SQL can then be accomplished for these particular databases. Only the result of SQL `WHERE` statements will be returned as layers.

---

## **Chapter 6**

# **OGR Utility Programs**

The following utilities are distributed as part of the OGR Simple Features toolkit:

- **ogrinfo** (p. 35)
  - **ogr2ogr** (p. 39)
  - **ogrindex** (p. 43)
-

## **Chapter 7**

### **ogrinfo**

lists information about an OGR supported data source

```
ogrinfo [-ro] [-q] [-where restricted_where]
        [-spat xmin ymin xmax ymax] [-fid fid]
        [-sql statement] [-al] [-so] [--formats]
        datasource_name [layer [layer ...]]
```

The ogrinfo program lists various information about an OGR supported data source to stdout (the terminal).

**-ro:** Open the data source in read-only mode.

**-al:** List all features of all layers (used instead of having to give layer names as arguments).

**-so:** Summary Only: suppress listing of features, show only the summary information like projection, schema, feature count and extents.

**-q:** Quiet verbose reporting of various information, including coordinate system, layer schema, extents, and feature count.

**-where *restricted\_where*:** An attribute query in a restricted form of the queries used in the SQL WHERE statement. Only features matching the attribute query will be reported.

**-sql *statement*:** Execute the indicated statement and return the result.

**-spat *xmin ymin xmax ymax*:** The area of interest. Only features within the rectangle will be reported.

**-fid *fid*:** If provided, only the feature with this feature id will be reported. Operates exclusive of the spatial or attribute queries.

**-formats:** List the format drivers that are enabled.

***datasource\_name*:** The data source to open. May be a filename, directory or other virtual name. See the OGR Vector Formats list for supported datasources.

***layer*:** One or more layer names may be reported.

If no layer names are passed then ogrinfo will report a list of available layers (and their layerwide geometry type). If layer name(s) are given then their extents, coordinate system, feature count, geometry type, schema and all features matching query parameters will be reported to the terminal. If no query parameters are provided, all features are reported.

Geometries are reported in OGC WKT format.

Example reporting all layers in an NTF file:

```
% ogrinfo wrk/SHETLAND_ISLANDS.NTF
INFO: Open of 'wrk/SHETLAND_ISLANDS.NTF'
using driver 'UK .NTF' successful.
1: BL2000_LINK (Line String)
2: BL2000_POLY (None)
3: BL2000_COLLECTIONS (None)
4: FEATURE_CLASSES (None)
```

Example using an attribute query is used to restrict the output of the features in a layer:

```
% ogrinfo -ro -where 'GLOBAL_LINK_ID=185878' wrk/SHETLAND_ISLANDS.NTF BL2000_LINK
INFO: Open of 'wrk/SHETLAND_ISLANDS.NTF'
using driver 'UK .NTF' successful.
```

```
Layer name: BL2000_LINK
```

---

---

```
Geometry: Line String
Feature Count: 1
Extent: (419794.100000, 1069031.000000) - (419927.900000, 1069153.500000)
Layer SRS WKT:
PROJCS["OSGB 1936 / British National Grid",
  GEOGCS["OSGB 1936",
    DATUM["OSGB_1936",
      SPHEROID["Airy 1830",6377563.396,299.3249646]],
    PRIMEM["Greenwich",0],
    UNIT["degree",0.0174532925199433]],
  PROJECTION["Transverse_Mercator"],
  PARAMETER["latitude_of_origin",49],
  PARAMETER["central_meridian",-2],
  PARAMETER["scale_factor",0.999601272],
  PARAMETER["false_easting",400000],
  PARAMETER["false_northing",-100000],
  UNIT["metre",1]]
LINE_ID: Integer (6.0)
GEOM_ID: Integer (6.0)
FEAT_CODE: String (4.0)
GLOBAL_LINK_ID: Integer (10.0)
TILE_REF: String (10.0)
OGRFeature(BL2000_LINK):2
  LINE_ID (Integer) = 2
  GEOM_ID (Integer) = 2
  FEAT_CODE (String) = (null)
  GLOBAL_LINK_ID (Integer) = 185878
  TILE_REF (String) = SHETLAND I
  LINESTRING (419832.100 1069046.300,419820.100 1069043.800,419808.300
1069048.800,419805.100 1069046.000,419805.000 1069040.600,419809.400
1069037.400,419827.400 1069035.600,419842 1069031,419859.000
1069032.800,419879.500 1069049.500,419886.700 1069061.400,419890.100
1069070.500,419890.900 1069081.800,419896.500 1069086.800,419898.400
1069092.900,419896.700 1069094.800,419892.500 1069094.300,419878.100
1069085.600,419875.400 1069087.300,419875.100 1069091.100,419872.200
1069094.600,419890.400 1069106.400,419907.600 1069112.800,419924.600
1069133.800,419927.900 1069146.300,419927.600 1069152.400,419922.600
1069153.500,419917.100 1069153.500,419911.500 1069153.000,419908.700
1069152.500,419903.400 1069150.800,419898.800 1069149.400,419894.800
1069149.300,419890.700 1069149.400,419890.600 1069149.400,419880.800
1069149.800,419876.900 1069148.900,419873.100 1069147.500,419870.200
1069146.400,419862.100 1069143.000,419860 1069142,419854.900
1069138.600,419850 1069135,419848.800 1069134.100,419843
1069130,419836.200 1069127.600,419824.600 1069123.800,419820.200
1069126.900,419815.500 1069126.900,419808.200 1069116.500,419798.700
1069117.600,419794.100 1069115.100,419796.300 1069109.100,419801.800
1069106.800,419805.000 1069107.300)
```

---



## **Chapter 8**

### **ogr2ogr**

converts simple features data between file formats

```
Usage: ogr2ogr [-skipfailures] [-append] [-update] [-f format_name] [-gt n]
              [-select field_list] [-where restricted_where]
              [-sql <sql statement>] [--help-general]
              [-spat xmin ymin xmax ymax] [-preserve_fid] [-fid FID]
              [-a_srs srs_def] [-t_srs srs_def] [-s_srs srs_def]
              [[-dsco NAME=VALUE] ...] dst_datasource_name
              src_datasource_name
              [-lco NAME=VALUE] [-nln name] [-nlt type] [layer [layer ...]]
```

This program can be used to convert simple features data between file formats performing various operations during the process such as spatial or attribute selections, reducing the set of attributes, setting the output coordinate system or even reprojecting the features during translation.

**-fformat\_name:** output file format name, some possible values are:

```
-f "ESRI Shapefile"
-f "TIGER"
-f "MapInfo File"
-f "GML"
-f "PostgreSQL"
```

**-append:** Append to existing layer instead of creating new

**-overwrite:** Delete the output layer and recreate it empty

**-update:** Open existing output datasource in update mode rather than trying to create a new one

**-selectfield\_list:** Comma-delimited list of fields from input layer to copy to the new layer (defaults to all)

**-sql sql\_statement:** SQL statement to execute. The resulting table/layer will be saved to the output.

**-whererestricted\_where:** Attribute query (like SQL WHERE)

**-skipfailures:** Continue after a failure, skipping the failed feature.

**-gt n:** group *n* features per transaction (default 200)

**-spatxmin ymin xmax ymax:** spatial query extents

**-dsco NAME=VALUE:** Dataset creation option (format specific)

**-lcoNAME=VALUE:** Layer creation option (format specific)

**-nlnname:** Assign an alternate name to the new layer

**-nlttype:** Define the geometry type for the created layer. One of NONE, GEOMETRY, POINT, LINestring, POLYGON, GEOMETRYCOLLECTION, MULTIPOINT, MULTILINE, MULTIPOLYGON or MULTILINESTRING. Add "25D" to the name to get 2.5D versions.

**-a\_srssrs\_def:** Assign an output SRS

**-t\_srssrs\_def:** Reproject/transform to this SRS on output

**-s\_srssrs\_def:** Override source SRS

**-fid fid:** If provided, only the feature with this feature id will be reported. Operates exclusive of the spatial or attribute queries.

Srs\_def can be a full WKT definition (hard to escape properly), or a well known definition (ie. EPSG:4326) or a file with a WKT definition.

Example appending to an existing layer (both flags need to be used):

```
% ogr2ogr -update -append -f PostgreSQL PG:dbname=warmerda abc.tab
```

More examples are given in the individual format pages.

---



## **Chapter 9**

### **ogrtindex**

creates a tileindex

```
ogrindex [-lnum n]... [-lname name]... [-f output_format]
         [-write_absolute_path] [-skip_different_projection]
         output_dataset src_dataset...
```

The ogrindex program can be used to create a tileindex - a file containing a list of the identities of a bunch of other files along with there spatial extents. This is primarily intended to be used with the UMN MapServer for tiled access to layers using the OGR connection type.

**-lnum *n*:** Add layer number '*n*' from each source file in the tile index.

**-lname *name*:** Add the layer named '*name*' from each source file in the tile index.

**-f *output\_format*:** Select an output format name. The default is to create a shapefile.

**-tileindex *field\_name*:** The name to use for the dataset name. Defaults to LOCATION.

**-write\_absolute\_path:** Filenames are written with absolute paths

**-skip\_different\_projection:** Only layers with same projection ref as layers already inserted in the tileindex will be inserted.

If no -lnum or -lname arguments are given it is assumed that all layers in source datasets should be added to the tile index as independent records.

If the tile index already exists it will be appended to, otherwise it will be created.

It is a flaw of the current ogrindex program that no attempt is made to copy the coordinate system definition from the source datasets to the tile index (as is expected by MapServer when PROJECTION AUTO is in use).

This example would create a shapefile (tindex.shp) containing a tile index of the BL2000\_LINK layers in all the NTF files in the wrk directory:

```
% ogrindex tindex.shp wrk/*.NTF
```

## **Chapter 10**

# **OGR Projections Tutorial**

## 10.1 Introduction

The **OGRSpatialReference** (p. 217), and **OGRCoordinateTransformation** (p. 86) classes provide services to represent coordinate systems (projections and datums) and to transform between them. These services are loosely modelled on the OpenGIS Coordinate Transformations specification, and use the same Well Known Text format for describing coordinate systems.

Some background on OpenGIS coordinate systems and services can be found in the Simple Features for COM, and Spatial Reference Systems Abstract Model documents available from [www.opengis.org](http://www.opengis.org). The GeoTIFF Projections Transform List ([http://www.remotesensing.org/geotiff/proj\\_list](http://www.remotesensing.org/geotiff/proj_list)) may also be of assistance in understanding formulations of projections in WKT. The EPSG Geodesy web page is also a useful resource.

## 10.2 Defining a Geographic Coordinate System

Coordinate systems are encapsulated in the **OGRSpatialReference** (p. 217) class. There are a number of ways of initializing an **OGRSpatialReference** (p. 217) object to a valid coordinate system. There are two primary kinds of coordinate systems. The first is geographic (positions are measured in long/lat) and the second is projected (such as UTM - positions are measured in meters or feet).

A Geographic coordinate system contains information on the datum (which implies an spheroid described by a semi-major axis, and inverse flattening), prime meridian (normally Greenwich), and an angular units type which is normally degrees. The following code initializes a geographic coordinate system on supplying all this information along with a user visible name for the geographic coordinate system.

```
OGRSpatialReference oSRS;

oSRS.SetGeogCS( "My geographic coordinate system",
               "WGS_1984",
               "My WGS84 Spheroid",
               SRS_WGS84_SEMIMAJOR, SRS_WGS84_INVFLATTENING,
               "Greenwich", 0.0,
               "degree", SRS_UA_DEGREE_CONV );
```

Of these values, the names "My geographic coordinate system", "My WGS84 Spheroid", "Greenwich" and "degree" are not keys, but are used for display to the user. However, the datum name "WGS\_1984" is used as a key to identify the datum, and there are rules on what values can be used. NOTE: Prepare writeup somewhere on valid datums!

The **OGRSpatialReference** (p. 217) has built in support for a few well known coordinate systems, which include "NAD27", "NAD83", "WGS72" and "WGS84" which can be defined in a single call to SetWellKnownGeogCS().

```
oSRS.SetWellKnownGeogCS( "WGS84" );
```

Furthermore, any geographic coordinate system in the EPSG database can be set by it's GCS code number if the EPSG database is available.

```
oSRS.SetWellKnownGeogCS( "EPSG:4326" );
```

For serialization, and transmission of projection definitions to other packages, the OpenGIS Well Known Text format for coordinate systems is used. An **OGRSpatialReference** (p. 217) can be initialized from well known text, or converted back into well known text.

```
char      *pszWKT = NULL;

oSRS.SetWellKnownGeogCS( "WGS84" );
oSRS.exportToWkt( &pszWKT );
printf( "%s\n", pszWKT );
```

gives something like:

```
GEOGCS["WGS 84",DATUM["WGS_1984",SPHEROID["WGS 84",6378137,298.257223563,
AUTHORITY["EPSG",7030]],TOWGS84[0,0,0,0,0,0,0],AUTHORITY["EPSG",6326]],
PRIMEM["Greenwich",0,AUTHORITY["EPSG",8901]],UNIT["DMSH",0.0174532925199433,
AUTHORITY["EPSG",9108]],AXIS["Lat",NORTH],AXIS["Long",EAST],AUTHORITY["EPSG",
4326]]
```

or in more readable form:

```
GEOGCS["WGS 84",
  DATUM["WGS_1984",
    SPHEROID["WGS 84",6378137,298.257223563,
      AUTHORITY["EPSG",7030]],
    TOWGS84[0,0,0,0,0,0,0],
    AUTHORITY["EPSG",6326]],
  PRIMEM["Greenwich",0,AUTHORITY["EPSG",8901]],
  UNIT["DMSH",0.0174532925199433,AUTHORITY["EPSG",9108]],
  AXIS["Lat",NORTH],
  AXIS["Long",EAST],
  AUTHORITY["EPSG",4326]]
```

The **OGRSpatialReference::importFromWkt()** (p. 240) method can be used to set an **OGRSpatialReference** (p. 217) from a WKT coordinate system definition.

## 10.3 Defining a Projected Coordinate System

A projected coordinate system (such as UTM, Lambert Conformal Conic, etc) requires an underlying geographic coordinate system as well as a definition for the projection transform used to translate between linear positions (in meters or feet) and angular long/lat positions. The following code defines a UTM zone 17 projected coordinate system with an underlying geographic coordinate system (datum) of WGS84.

```
OGRSpatialReference oSRS;

oSRS.SetProjCS( "UTM 17 (WGS84) in northern hemisphere." );
oSRS.SetWellKnownGeogCS( "WGS84" );
oSRS.SetUTM( 17, TRUE );
```

Calling **SetProjCS()** sets a user name for the projected coordinate system and establishes that the system is projected. The **SetWellKnownGeogCS()** associates a geographic coordinate system, and the **SetUTM()** call sets detailed projection transformation parameters. At this time the above order is important in order to create a valid definition, but in the future the object will automatically reorder the internal representation as needed to remain valid. For now **be careful of the order of steps defining an OGRSpatialReference!**

The above definition would give a WKT version that looks something like the following. Note that the UTM 17 was expanded into the details transverse mercator definition of the UTM zone.

```
PROJCS["UTM 17 (WGS84) in northern hemisphere.",
```

```

GEOGCS["WGS 84",
    DATUM["WGS_1984",
        SPHEROID["WGS 84",6378137,298.257223563,
            AUTHORITY["EPSG",7030]],
        TOWGS84[0,0,0,0,0,0,0],
        AUTHORITY["EPSG",6326]],
    PRIMEM["Greenwich",0,AUTHORITY["EPSG",8901]],
    UNIT["DMSH",0.0174532925199433,AUTHORITY["EPSG",9108]],
    AXIS["Lat",NORTH],
    AXIS["Long",EAST],
    AUTHORITY["EPSG",4326]],
PROJECTION["Transverse_Mercator"],
PARAMETER["latitude_of_origin",0],
PARAMETER["central_meridian",-81],
PARAMETER["scale_factor",0.9996],
PARAMETER["false_easting",500000],
PARAMETER["false_northing",0]]

```

There are methods for many projection methods including `SetTM()` (Transverse Mercator), `SetLCC()` (Lambert Conformal Conic), and `SetMercator()`.

## 10.4 Querying Coordinate System

Once an **OGRSpatialReference** (p.217) has been established, various information about it can be queried. It can be established if it is a projected or geographic coordinate system using the **OGRSpatialReference::IsProjected()** (p.241) and **OGRSpatialReference::IsGeographic()** (p.241) methods. The **OGRSpatialReference::GetSemiMajor()** (p.230), **OGRSpatialReference::GetSemiMinor()** (p.230) and **OGRSpatialReference::GetInvFlattening()** (p.228) methods can be used to get information about the spheroid. The **OGRSpatialReference::GetAttrValue()** (p.226) method can be used to get the PROJCS, GEOGCS, DATUM, SPHEROID, and PROJECTION names strings. The **OGRSpatialReference::GetProjParm()** (p.229) method can be used to get the projection parameters. The **OGRSpatialReference::GetLinearUnits()** (p.228) method can be used to fetch the linear units type, and translation to meters.

The following code (from `ogr_srs_proj4.cpp`) demonstrates use of `GetAttrValue()` to get the projection, and `GetProjParm()` to get projection parameters. The `GetAttrValue()` method searches for the first "value" node associated with the named entry in the WKT text representation. The defined constants for projection parameters (such as `SRS_PP_CENTRAL_MERIDIAN`) should be used when fetching projection parameter with `GetProjParm()`. The code for the Set methods of the various projections in `ogrsatialreference.cpp` can be consulted to find which parameters apply to which projections.

```

const char *pszProjection = poSRS->GetAttrValue("PROJECTION");

if( pszProjection == NULL )
{
    if( poSRS->IsGeographic() )
        sprintf( szProj4+strlen(szProj4), "+proj=longlat " );
    else
        sprintf( szProj4+strlen(szProj4), "unknown " );
}
else if( EQUAL(pszProjection,SRS_PT_CYLINDRICAL_EQUAL_AREA) )
{
    sprintf( szProj4+strlen(szProj4),
        "+proj=cea +lon_0=%.9f +lat_ts=%.9f +x_0=%.3f +y_0=%.3f ",
        poSRS->GetProjParm(SRS_PP_CENTRAL_MERIDIAN,0.0),
        poSRS->GetProjParm(SRS_PP_STANDARD_PARALLEL_1,0.0),
        poSRS->GetProjParm(SRS_PP_FALSE_EASTING,0.0),

```

```

        poSRS->GetProjParm(SRS_PP_FALSE_NORTHING,0.0) );
    }
    ...

```

## 10.5 Coordinate Transformation

The **OGRCoordinateTransformation** (p. 86) class is used for translating positions between different coordinate systems. New transformation objects are created using **OGRCreateCoordinateTransformation()** (p. 391), and then the **OGRCoordinateTransformation::Transform()** (p. 86) method can be used to convert points between coordinate systems.

```

OGRSpatialReference oSourceSRS, oTargetSRS;
OGRCoordinateTransformation *poCT;
double
    x, y;

oSourceSRS.ImportFromEPSG( atoi(papszArgv[i+1]) );
oTargetSRS.ImportFromEPSG( atoi(papszArgv[i+2]) );

poCT = OGRCreateCoordinateTransformation( &oSourceSRS,
                                          &oTargetSRS );

x = atof( papszArgv[i+3] );
y = atof( papszArgv[i+4] );

if( poCT == NULL || !poCT->Transform( 1, &x, &y ) )
    printf( "Transformation failed.\n" );
else
    printf( "(%f,%f) -> (%f,%f)\n",
            atof( papszArgv[i+3] ),
            atof( papszArgv[i+4] ),
            x, y );

```

There are a couple of points at which transformations can fail. First, **OGRCreateCoordinateTransformation()** (p. 391) may fail, generally because the internals recognise that no transformation between the indicated systems can be established. This might be due to use of a projection not supported by the internal PROJ.4 library, differing datums for which no relationship is known, or one of the coordinate systems being inadequately defined. If **OGRCreateCoordinateTransformation()** (p. 391) fails it will return a NULL.

The **OGRCoordinateTransformation::Transform()** (p. 86) method itself can also fail. This may be as a delayed result of one of the above problems, or as a result of an operation being numerically undefined for one or more of the passed in points. The **Transform()** function will return TRUE on success, or FALSE if any of the points fail to transform. The point array is left in an indeterminate state on error.

Though not shown above, the coordinate transformation service can take 3D points, and will adjust elevations for elevation differences in spheroids, and datums. At some point in the future shifts between different vertical datums may also be applied. If no Z is passed, it is assumed that the point is on the geoid.

The following example shows how to conveniently create a lat/long coordinate system using the same geographic coordinate system as a projected coordinate system, and using that to transform between projected coordinates and lat/long.

```

OGRSpatialReference oUTM, *poLatLong;
OGRCoordinateTransformation *poTransform;

oUTM.SetProjCS("UTM 17 / WGS84");
oUTM.SetWellKnownGeogCS( "WGS84" );
oUTM.SetUTM( 17 );

poLatLong = oUTM.CloneGeogCS();

```

```

poTransform = OGRCreateCoordinateTransformation( &oUTM, poLatLong );
if( poTransform == NULL )
{
    ...
}

...

if( !poTransform->Transform( nPoints, x, y, z ) )
...

```

## 10.6 Alternate Interfaces

A C interface to the coordinate system services is defined in **ogr\_srs\_api.h** (p. 392), and Python bindings are available via the `osr.py` module. Methods are close analogs of the C++ methods but C and Python bindings are missing for some C++ methods.

### C Bindings

```

typedef void *OGRSpatialReferenceH;
typedef void *OGRCoordinateTransformationH;

OGRSpatialReferenceH OSRNewSpatialReference( const char * );
void OSRDestroySpatialReference( OGRSpatialReferenceH );

int OSRReference( OGRSpatialReferenceH );
int OSRDereference( OGRSpatialReferenceH );

OGRERR OSRImportFromEPSG( OGRSpatialReferenceH, int );
OGRERR OSRImportFromWkt( OGRSpatialReferenceH, char ** );
OGRERR OSRExportToWkt( OGRSpatialReferenceH, char ** );

OGRERR OSRSetAttrValue( OGRSpatialReferenceH hSRS, const char * pszNodePath,
                        const char * pszNewNodeValue );
const char *OSRGetAttrValue( OGRSpatialReferenceH hSRS,
                             const char * pszName, int iChild);

OGRERR OSRSetLinearUnits( OGRSpatialReferenceH, const char *, double );
double OSRGetLinearUnits( OGRSpatialReferenceH, char ** );

int OSRIsGeographic( OGRSpatialReferenceH );
int OSRIsProjected( OGRSpatialReferenceH );
int OSRIsSameGeogCS( OGRSpatialReferenceH, OGRSpatialReferenceH );
int OSRIsSame( OGRSpatialReferenceH, OGRSpatialReferenceH );

OGRERR OSRSetProjCS( OGRSpatialReferenceH hSRS, const char * pszName );
OGRERR OSRSetWellKnownGeogCS( OGRSpatialReferenceH hSRS,
                              const char * pszName );

OGRERR OSRSetGeogCS( OGRSpatialReferenceH hSRS,
                    const char * pszGeogName,
                    const char * pszDatumName,
                    const char * pszEllipsoidName,
                    double dfSemiMajor, double dfInvFlattening,
                    const char * pszPMName,
                    double dfPMOffset,
                    const char * pszUnits,
                    double dfConvertToRadians );

double OSRGetSemiMajor( OGRSpatialReferenceH, OGRERR * );
double OSRGetSemiMinor( OGRSpatialReferenceH, OGRERR * );
double OSRGetInvFlattening( OGRSpatialReferenceH, OGRERR * );

```

---

```

OGRERR OSRSetAuthority( OGRSpatialReferenceH hSRS,
                        const char * pszTargetKey,
                        const char * pszAuthority,
                        int nCode );

OGRERR OSRSetProjParm( OGRSpatialReferenceH, const char *, double );
double OSRGetProjParm( OGRSpatialReferenceH hSRS,
                        const char * pszParmName,
                        double dfDefault,
                        OGRERR * );

OGRERR OSRSetUTM( OGRSpatialReferenceH hSRS, int nZone, int bNorth );
int OSRGetUTMZone( OGRSpatialReferenceH hSRS, int *pbNorth );

OGRCoordinateTransformationH
OCTNewCoordinateTransformation( OGRSpatialReferenceH hSourceSRS,
                                OGRSpatialReferenceH hTargetSRS );
void OCTDestroyCoordinateTransformation( OGRCoordinateTransformationH );

int OCTTransform( OGRCoordinateTransformationH hCT,
                  int nCount, double *x, double *y, double *z );

```

### Python Bindings

```

class osr.SpatialReference
    def __init__(self, obj=None):
    def ImportFromWkt( self, wkt ):
    def ExportToWkt(self):
    def ImportFromEPSG(self, code):
    def IsGeographic(self):
    def IsProjected(self):
    def GetAttrValue(self, name, child = 0):
    def SetAttrValue(self, name, value):
    def SetWellKnownGeogCS(self, name):
    def SetProjCS(self, name = "unnamed" ):
    def IsSameGeogCS(self, other):
    def IsSame(self, other):
    def SetLinearUnits(self, units_name, to_meters ):
    def SetUTM(self, zone, is_north = 1):

class CoordinateTransformation:
    def __init__(self, source, target):
    def TransformPoint(self, x, y, z = 0):
    def TransformPoints(self, points):

```

## 10.7 Internal Implementation

The **OGRCoordinateTransformation** (p. 86) service is implemented on top of the PROJ. 4 library originally written by Gerald Evenden of the USGS.



# Chapter 11

## Directory Hierarchy

### 11.1 Directories

This directory hierarchy is sorted roughly, but not completely, alphabetically:

ogrsf_frmts . . . . .	62
generic . . . . .	61
port . . . . .	63



# Chapter 12

## Class Index

### 12.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

_CPLList . . . . .	65
CPLODBCDriverInstaller . . . . .	66
CPLODBCSession . . . . .	68
CPLODBCStatement . . . . .	69
CPLXMLNode . . . . .	77
OGR_SRSNode . . . . .	79
OGRCoordinateTransformation . . . . .	86
OGRDataSource . . . . .	90
OGREnvelope . . . . .	98
OGRFeature . . . . .	99
OGRFeatureDefn . . . . .	113
OGRField . . . . .	118
OGRFieldDefn . . . . .	119
OGRGeometry . . . . .	124
OGRCurve . . . . .	88
OGRLineString . . . . .	171
OGRLinearRing . . . . .	167
OGRGeometryCollection . . . . .	141
OGRMultiLineString . . . . .	183
OGRMultiPoint . . . . .	186
OGRMultiPolygon . . . . .	189
OGRPoint . . . . .	193
OGRSurface . . . . .	260
OGRPolygon . . . . .	201
OGRGeometryFactory . . . . .	151
OGRLayer . . . . .	156
OGRRawPoint . . . . .	210
OGRSFDriver . . . . .	211
OGRSFDriverRegistrar . . . . .	214
OGRSpatialReference . . . . .	217



# Chapter 13

## Class Index

### 13.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<b>_CPLList</b>	65
<b>CPLODBCDriverInstaller</b>	66
<b>CPLODBCSession</b>	68
<b>CPLODBCStatement</b>	69
<b>CPLXMLNode</b>	77
<b>OGR_SRSNode</b>	79
<b>OGRCoordinateTransformation</b>	86
<b>OGRCurve</b>	88
<b>OGRDataSource</b>	90
<b>OGREnvelope</b>	98
<b>OGRFeature</b>	99
<b>OGRFeatureDefn</b>	113
<b>OGRField</b>	118
<b>OGRFieldDefn</b>	119
<b>OGRGeometry</b>	124
<b>OGRGeometryCollection</b>	141
<b>OGRGeometryFactory</b>	151
<b>OGRLayer</b>	156
<b>OGRLinearRing</b>	167
<b>OGRLineString</b>	171
<b>OGRMultiLineString</b>	183
<b>OGRMultiPoint</b>	186
<b>OGRMultiPolygon</b>	189
<b>OGRPoint</b>	193
<b>OGRPolygon</b>	201
<b>OGRRawPoint</b>	210
<b>OGRSFDriver</b>	211
<b>OGRSFDriverRegistrar</b>	214
<b>OGRSpatialReference</b>	217
<b>OGRSurface</b>	260



# Chapter 14

## File Index

### 14.1 File List

Here is a list of all documented files with brief descriptions:

cpl_config.h	??
cpl_conv.h	263
cpl_csv.h	??
cpl_error.h	286
cpl_http.h	??
cpl_list.h	290
cpl_minixml.h	294
cpl_multiproc.h	??
cpl_odbc.h	303
cpl_port.h	304
cpl_string.h	305
cpl_vsi.h	312
cpl_vsi_virtual.h	??
cpl_win32ce_api.h	??
cpl_wince.h	??
ogr_api.h	322
ogr_attrind.h	??
ogr_core.h	384
ogr_feature.h	389
ogr_featurestyle.h	??
ogr_gensql.h	??
ogr_geometry.h	390
ogr_geos.h	??
ogr_p.h	??
ogr_spatialref.h	391
ogr_srs_api.h	392
ogrsf_frmts.h	402
swq.h	??



## Chapter 15

# Directory Documentation

### 15.1 ogrsf\_frmts/generic/ Directory Reference

#### Files

- file `ogr_attrind.cpp`
- file `ogr_gensql.cpp`
- file `ogr_gensql.h`
- file `ogr_miattrind.cpp`
- file `ogrdatasource.cpp`
- file `ogrlayer.cpp`
- file `ogrregisterall.cpp`
- file `ogrsfdriver.cpp`
- file `ogrsfdriverregistrar.cpp`

## 15.2 ogrsf\_frmts/ Directory Reference

### Directories

- directory **generic**

### Files

- file **ogr\_attrind.h**
  - file **ogrsf\_frmts.h**
-

## 15.3 /builddir/build/BUILD/gdal-1.5.3-fedora/port/ Directory Reference

### Files

- file `cpl_config.h`
  - file `cpl_conv.cpp`
  - file `cpl_conv.h`
  - file `cpl_csv.cpp`
  - file `cpl_csv.h`
  - file `cpl_error.cpp`
  - file `cpl_error.h`
  - file `cpl_findfile.cpp`
  - file `cpl_getexecpath.cpp`
  - file `cpl_http.cpp`
  - file `cpl_http.h`
  - file `cpl_list.cpp`
  - file `cpl_list.h`
  - file `cpl_minixml.cpp`
  - file `cpl_minixml.h`
  - file `cpl_multiproc.cpp`
  - file `cpl_multiproc.h`
  - file `cpl_odbc.cpp`
  - file `cpl_odbc.h`
  - file `cpl_path.cpp`
  - file `cpl_port.h`
  - file `cpl_string.cpp`
  - file `cpl_string.h`
  - file `cpl_strtod.cpp`
  - file `cpl_vsi.h`
  - file `cpl_vsi_mem.cpp`
  - file `cpl_vsi_virtual.h`
  - file `cpl_vsil.cpp`
  - file `cpl_vsil_simple.cpp`
  - file `cpl_vsil_unix_stdio_64.cpp`
  - file `cpl_vsil_win32.cpp`
  - file `cpl_vsisimple.cpp`
  - file `cpl_win32ce_api.cpp`
  - file `cpl_win32ce_api.h`
  - file `cpl_wince.h`
  - file `cplgetsymbol.cpp`
  - file `cplstring.cpp`
  - file `xmlreformat.cpp`
-



# Chapter 16

## Class Documentation

### 16.1 `_CPLList` Struct Reference

```
#include <cpl_list.h>
```

#### Public Attributes

- `void * pData`
- `struct _CPLList * psNext`

#### 16.1.1 Detailed Description

List element structure.

#### 16.1.2 Member Data Documentation

##### 16.1.2.1 `void* _CPLList::pData`

Pointer to the data object. Should be allocated and freed by the caller.

Referenced by `CPLListAppend()`, `CPLListGetData()`, and `CPLListInsert()`.

##### 16.1.2.2 `struct _CPLList* _CPLList::psNext` [read]

Pointer to the next element in list. NULL, if current element is the last one

Referenced by `CPLListAppend()`, `CPLListCount()`, `CPLListDestroy()`, `CPLListGet()`, `CPLListGetLast()`, `CPLListGetNext()`, `CPLListInsert()`, and `CPLListRemove()`.

The documentation for this struct was generated from the following file:

- `cpl_list.h`

## 16.2 CPODBCDriverInstaller Class Reference

```
#include <cpl_odbc.h>
```

### Public Member Functions

- **int InstallDriver** (const char \*pszDriver, const char \*pszPathIn, WORD fRequest=ODBC\_INSTALL\_COMPLETE)
- **int RemoveDriver** (const char \*pszDriverName, int fRemoveDSN=0)

### 16.2.1 Detailed Description

A class providing functions to install or remove ODBC driver.

### 16.2.2 Member Function Documentation

#### 16.2.2.1 int CPODBCDriverInstaller::InstallDriver (const char \* *pszDriver*, const char \* *pszPathIn*, WORD *fRequest* = ODBC\_INSTALL\_COMPLETE)

Installs ODBC driver or updates definition of already installed driver. Internally, it calls ODBC's SQLInstallDriverEx function.

##### Parameters:

- pszDriver* - The driver definition as a list of keyword-value pairs describing the driver (See ODBC API Reference).
- pszPathIn* - Full path of the target directory of the installation, or a null pointer (for unixODBC, NULL is passed).
- fRequest* - The fRequest argument must contain one of the following values: ODBC\_INSTALL\_COMPLETE - (default) complete the installation request ODBC\_INSTALL\_INQUIRY - inquire about where a driver can be installed

##### Returns:

TRUE indicates success, FALSE if it fails.

#### 16.2.2.2 int CPODBCDriverInstaller::RemoveDriver (const char \* *pszDriverName*, int *fRemoveDSN* = 0)

Removes or changes information about the driver from the Odbcinst.ini entry in the system information.

##### Parameters:

- pszDriverName* - The name of the driver as registered in the Odbcinst.ini key of the system information.
- fRemoveDSN* - TRUE: Remove DSNs associated with the driver specified in lpszDriver. FALSE: Do not remove DSNs associated with the driver specified in lpszDriver.

**Returns:**

The function returns TRUE if it is successful, FALSE if it fails. If no entry exists in the system information when this function is called, the function returns FALSE. In order to obtain usage count value, call GetUsageCount().

The documentation for this class was generated from the following files:

- **cpl\_odbc.h**
- cpl\_odbc.cpp

## 16.3 CPODBCSession Class Reference

```
#include <cpl_odbc.h>
```

### Public Member Functions

- int **EstablishSession** (const char \*pszDSN, const char \*pszUserid, const char \*pszPassword)
- const char \* **GetLastError** ()

#### 16.3.1 Detailed Description

A class representing an ODBC database session.

Includes error collection services.

#### 16.3.2 Member Function Documentation

##### 16.3.2.1 int CPODBCSession::EstablishSession (const char \* *pszDSN*, const char \* *pszUserid*, const char \* *pszPassword*)

Connect to database and logon.

##### Parameters:

*pszDSN* The name of the DSN being used to connect. This is not optional.

*pszUserid* the userid to logon as, may be NULL if not required, or provided by the DSN.

*pszPassword* the password to logon with. May be NULL if not required or provided by the DSN.

##### Returns:

TRUE on success or FALSE on failure. Call **GetLastError()** (p. 68) to get details on failure.

References GetLastError().

##### 16.3.2.2 const char \* CPODBCSession::GetLastError ()

Returns the last ODBC error message.

##### Returns:

pointer to an internal buffer with the error message in it. Do not free or alter. Will be an empty (but not NULL) string if there is no pending error info.

Referenced by EstablishSession(), and CPODBCStatement::Fetch().

The documentation for this class was generated from the following files:

- **cpl\_odbc.h**
  - **cpl\_odbc.cpp**
-

## 16.4 CPODBCStatement Class Reference

```
#include <cpl_odbc.h>
```

### Public Member Functions

- void **Clear** ()
- void **AppendEscaped** (const char \*)
- void **Append** (const char \*)
- void **Append** (int)
- void **Append** (double)
- int **Appendf** (const char \*,...)
- int **ExecuteSQL** (const char \*==0)
- int **Fetch** (int nOrientation=SQL\_FETCH\_NEXT, int nOffset=0)
- int **GetColCount** ()
- const char \* **GetColName** (int)
- short **GetColType** (int)
- const char \* **GetColTypeName** (int)
- short **GetColSize** (int)
- short **GetColPrecision** (int)
- short **GetColNullable** (int)
- int **GetColId** (const char \*)
- const char \* **GetColData** (int, const char \*==0)
- const char \* **GetColData** (const char \*, const char \*==0)
- int **GetColumns** (const char \*pszTable, const char \*pszCatalog=0, const char \*pszSchema=0)
- int **GetPrimaryKeys** (const char \*pszTable, const char \*pszCatalog=0, const char \*pszSchema=0)
- int **GetTables** (const char \*pszCatalog=0, const char \*pszSchema=0)
- void **DumpResult** (FILE \*fp, int bShowSchema=0)

### Static Public Member Functions

- static CPLString **GetTypeName** (int)
- static SQLSMALLINT **GetTypeMapping** (SQLSMALLINT)

#### 16.4.1 Detailed Description

Abstraction for statement, and resultset.

Includes methods for executing an SQL statement, and for accessing the resultset from that statement. Also provides for executing other ODBC requests that produce results sets such as SQLColumns() and SQLTables() requests.

#### 16.4.2 Member Function Documentation

##### 16.4.2.1 void CPODBCStatement::Append (double *dfValue*)

Append to internal command.

The passed value is formatted and appended to the internal SQL command text.

---

**Parameters:**

*dfValue* value to append to the command.

References Append().

**16.4.2.2 void CPODBCStatement::Append (int *nValue*)**

Append to internal command.

The passed value is formatted and appended to the internal SQL command text.

**Parameters:**

*nValue* value to append to the command.

References Append().

**16.4.2.3 void CPODBCStatement::Append (const char \* *pszText*)**

Append text to internal command.

The passed text is appended to the internal SQL command text.

**Parameters:**

*pszText* text to append.

Referenced by Append(), AppendEscaped(), Appendf(), and ExecuteSQL().

**16.4.2.4 void CPODBCStatement::AppendEscaped (const char \* *pszText*)**

Append text to internal command.

The passed text is appended to the internal SQL command text after escaping any special characters so it can be used as a character string in an SQL statement.

**Parameters:**

*pszText* text to append.

References Append().

**16.4.2.5 int CPODBCStatement::Appendf (const char \* *pszFormat*, ...)**

Append to internal command.

The passed format is used to format other arguments and the result is appended to the internal command text. Long results may not be formatted properly, and should be appended with the direct **Append()** (p. 70) methods.

**Parameters:**

*pszFormat* printf() style format string.

---

**Returns:**

FALSE if formatting fails due to result being too large.

References Append().

**16.4.2.6 void CPODBCStatement::Clear ()**

Clear internal command text and result set definitions.

Referenced by ExecuteSQL().

**16.4.2.7 void CPODBCStatement::DumpResult (FILE \**fp*, int *bShowSchema* = 0)**

Dump resultset to file.

The contents of the current resultset are dumped in a simply formatted form to the provided file. If requested, the schema definition will be written first.

**Parameters:**

*fp* the file to write to. stdout or stderr are acceptable.

*bShowSchema* TRUE to force writing schema information for the rowset before the rowset data itself.  
Default is FALSE.

References Fetch(), GetColCount(), GetColData(), GetColName(), GetColNullable(), GetColPrecision(), GetColSize(), GetColType(), and GetTypeName().

**16.4.2.8 int CPODBCStatement::ExecuteSQL (const char \**pszStatement* = 0)**

Execute an SQL statement.

This method will execute the passed (or stored) SQL statement, and initialize information about the resultset if there is one. If a NULL statement is passed, the internal stored statement that has been previously set via **Append()** (p. 70) or **Appendf()** (p. 70) calls will be used.

**Parameters:**

*pszStatement* the SQL statement to execute, or NULL if the internally saved one should be used.

**Returns:**

TRUE on success or FALSE if there is an error. Error details can be fetched with OGRODBCSession::GetLastError().

References Append(), and Clear().

**16.4.2.9 int CPODBCStatement::Fetch (int *nOrientation* = SQL\_FETCH\_NEXT, int *nOffset* = 0)**

Fetch a new record.

Requests the next row in the current resultset using the SQLFetchScroll() call. Note that many ODBC drivers only support the default forward fetching one record at a time. Only SQL\_FETCH\_NEXT (the default) should be considered reliable on all drivers.

---

Currently it isn't clear how to determine whether an error or a normal out of data condition has occurred if **Fetch()** (p. 71) fails.

**Parameters:**

***nOrientation*** One of SQL\_FETCH\_NEXT, SQL\_FETCH\_LAST, SQL\_FETCH\_PRIOR, SQL\_FETCH\_ABSOLUTE, or SQL\_FETCH\_RELATIVE (default is SQL\_FETCH\_NEXT).

***nOffset*** the offset (number of records), ignored for some orientations.

**Returns:**

TRUE if a new row is successfully fetched, or FALSE if not.

References CPODBCSession::GetLastError(), and GetTypeMapping().

Referenced by DumpResult().

#### 16.4.2.10 int CPODBCStatement::GetColCount ()

Fetch the resultset column count.

**Returns:**

the column count, or zero if there is no resultset.

Referenced by DumpResult().

#### 16.4.2.11 const char \* CPODBCStatement::GetColData (const char \* *pszColName*, const char \* *pszDefault* = 0)

Fetch column data.

Fetches the data contents of the requested column for the currently loaded row. The result is returned as a string regardless of the column type. NULL is returned if an illegal column is given, or if the actual column is "NULL".

**Parameters:**

***pszColName*** the name of the column requested.

***pszDefault*** the value to return if the column does not exist, or is NULL. Defaults to NULL.

**Returns:**

pointer to internal column data or NULL on failure.

References GetColData(), and GetColId().

#### 16.4.2.12 const char \* CPODBCStatement::GetColData (int *iCol*, const char \* *pszDefault* = 0)

Fetch column data.

Fetches the data contents of the requested column for the currently loaded row. The result is returned as a string regardless of the column type. NULL is returned if an illegal column is given, or if the actual column is "NULL".

---

**Parameters:**

*iCol* the zero based column to fetch.

*pszDefault* the value to return if the column does not exist, or is NULL. Defaults to NULL.

**Returns:**

pointer to internal column data or NULL on failure.

Referenced by DumpResult(), and GetColData().

**16.4.2.13 int CPODBCStatement::GetColId (const char \* pszColName)**

Fetch column index.

Gets the column index corresponding with the passed name. The name comparisons are case insensitive.

**Parameters:**

*pszColName* the name to search for.

**Returns:**

the column index, or -1 if not found.

Referenced by GetColData().

**16.4.2.14 const char \* CPODBCStatement::GetColName (int iCol)**

Fetch a column name.

**Parameters:**

*iCol* the zero based column index.

**Returns:**

NULL on failure (out of bounds column), or a pointer to an internal copy of the column name.

Referenced by DumpResult().

**16.4.2.15 short CPODBCStatement::GetColNullable (int iCol)**

Fetch the column nullability.

**Parameters:**

*iCol* the zero based column index.

**Returns:**

TRUE if the column may contains or FALSE otherwise.

Referenced by DumpResult().

---

**16.4.2.16 short CPODBCStatement::GetColPrecision (int *iCol*)**

Fetch the column precision.

**Parameters:**

*iCol* the zero based column index.

**Returns:**

column precision, may be zero or the same as column size for columns to which it does not apply.

Referenced by DumpResult().

**16.4.2.17 short CPODBCStatement::GetColSize (int *iCol*)**

Fetch the column width.

**Parameters:**

*iCol* the zero based column index.

**Returns:**

column width, zero for unknown width columns.

Referenced by DumpResult().

**16.4.2.18 short CPODBCStatement::GetColType (int *iCol*)**

Fetch a column data type.

The return type code is a an ODBC SQL\_ code, one of SQL\_UNKNOWN\_TYPE, SQL\_CHAR, SQL\_NUMERIC, SQL\_DECIMAL, SQL\_INTEGER, SQL\_SMALLINT, SQL\_FLOAT, SQL\_REAL, SQL\_DOUBLE, SQL\_DATETIME, SQL\_VARCHAR, SQL\_TYPE\_DATE, SQL\_TYPE\_TIME, SQL\_TYPE\_TIMESTAMP.

**Parameters:**

*iCol* the zero based column index.

**Returns:**

type code or -1 if the column is illegal.

Referenced by DumpResult().

**16.4.2.19 const char \* CPODBCStatement::GetColTypeName (int *iCol*)**

Fetch a column data type name.

Returns data source-dependent data type name; for example, "CHAR", "VARCHAR", "MONEY", "LONG VARBINAR", or "CHAR ( ) FOR BIT DATA".

**Parameters:**

*iCol* the zero based column index.

---

**Returns:**

NULL on failure (out of bounds column), or a pointer to an internal copy of the column dat type name.

**16.4.2.20** `int CPODBCStatement::GetColumns (const char * pszTable, const char * pszCatalog = 0, const char * pszSchema = 0)`

Fetch column definitions for a table.

The SQLColumn() method is used to fetch the definitions for the columns of a table (or other queriable object such as a view). The column definitions are digested and used to populate the **CPODBCStatement** (p. 69) column definitions essentially as if a "SELECT \* FROM tablename" had been done; however, no resultset will be available.

**Parameters:**

*pszTable* the name of the table to query information on. This should not be empty.

*pszCatalog* the catalog to find the table in, use NULL (the default) if no catalog is available.

*pszSchema* the schema to find the table in, use NULL (the default) if no schema is available.

**Returns:**

TRUE on success or FALSE on failure.

**16.4.2.21** `int CPODBCStatement::GetPrimaryKeys (const char * pszTable, const char * pszCatalog = 0, const char * pszSchema = 0)`

Fetch primary keys for a table.

The SQLPrimaryKeys() function is used to fetch a list of fields forming the primary key. The result is returned as a result set matching the SQLPrimaryKeys() function result set. The 4th column in the result set is the column name of the key, and if the result set contains only one record then that single field will be the complete primary key.

**Parameters:**

*pszTable* the name of the table to query information on. This should not be empty.

*pszCatalog* the catalog to find the table in, use NULL (the default) if no catalog is available.

*pszSchema* the schema to find the table in, use NULL (the default) if no schema is available.

**Returns:**

TRUE on success or FALSE on failure.

**16.4.2.22** `int CPODBCStatement::GetTables (const char * pszCatalog = 0, const char * pszSchema = 0)`

Fetch tables in database.

The SQLTables() function is used to fetch a list tables in the database. The result is returned as a result set matching the SQLTables() function result set. The 3rd column in the result set is the table name. Only tables of type "TABLE" are returned.

---

**Parameters:**

*pszCatalog* the catalog to find the table in, use NULL (the default) if no catalog is available.  
*pszSchema* the schema to find the table in, use NULL (the default) if no schema is available.

**Returns:**

TRUE on success or FALSE on failure.

**16.4.2.23 SQLSMALLINT CPODBCStatement::GetTypeMapping (SQLSMALLINT *nTypeCode*) [static]**

Get appropriate C data type for SQL column type.

Returns a C data type code, corresponding to the indicated SQL data type code (as returned from **CPODBCStatement::GetColType()** (p. 74)).

**Parameters:**

*nTypeCode* the SQL\_ code, such as SQL\_CHAR.

**Returns:**

data type code. The valid code is always returned. If SQL code is not recognised, SQL\_C\_BINARY will be returned.

Referenced by Fetch().

**16.4.2.24 CPLString CPODBCStatement::GetTypeName (int *nTypeCode*) [static]**

Get name for SQL column type.

Returns a string name for the indicated type code (as returned from **CPODBCStatement::GetColType()** (p. 74)).

**Parameters:**

*nTypeCode* the SQL\_ code, such as SQL\_CHAR.

**Returns:**

internal string, "UNKNOWN" if code not recognised.

Referenced by DumpResult().

The documentation for this class was generated from the following files:

- **cpl\_odbc.h**
  - **cpl\_odbc.cpp**
-

## 16.5 CPLXMLNode Struct Reference

```
#include <cpl_minixml.h>
```

### Public Attributes

- **CPLXMLNodeType eType**  
*Node type.*
- **char \* pszValue**  
*Node value.*
- **struct CPLXMLNode \* psNext**  
*Next sibling.*
- **struct CPLXMLNode \* psChild**  
*Child node.*

### 16.5.1 Detailed Description

Document node structure.

This C structure is used to hold a single text fragment representing a component of the document when parsed. It should be allocated with the appropriate CPL function, and freed with **CPLDestroyXMLNode()** (p. 297). The structure contents should not normally be altered by application code, but may be freely examined by application code.

Using the psChild and psNext pointers, a heirarchical tree structure for a document can be represented as a tree of **CPLXMLNode** (p. 77) structures.

### 16.5.2 Member Data Documentation

#### 16.5.2.1 CPLXMLNodeType CPLXMLNode::eType

Node type.

One of CXT\_Element, CXT\_Text, CXT\_Attribute, CXT\_Comment, or CXT\_Literal.

Referenced by CPLAddXMLChild(), CPLCloneXMLTree(), CPLCreateXMLNode(), CPLGetXMLNode(), CPLGetXMLValue(), CPLSearchXMLNode(), CPLSetXMLValue(), and CPLStripXMLNamespaces().

#### 16.5.2.2 struct CPLXMLNode\* CPLXMLNode::psChild [read]

Child node.

Pointer to first child node, if any. Only CXT\_Element and CXT\_Attribute nodes should have children. For CXT\_Attribute it should be a single CXT\_Text value node, while CXT\_Attribute can have any kind of child. The full list of children for a node are identified by walking the psNext's starting with the psChild node.

Referenced by `CPLAddXMLChild()`, `CPLCloneXMLTree()`, `CPLCreateXMLNode()`, `CPLDestroyXMLNode()`, `CPLGetXMLNode()`, `CPLGetXMLValue()`, `CPLRemoveXMLChild()`, `CPLSearchXMLNode()`, `CPLSetXMLValue()`, and `CPLStripXMLNamespace()`.

### 16.5.2.3 `struct CPLXMLNode* CPLXMLNode::psNext` [read]

Next sibling.

Pointer to next sibling, that is the next node appearing after this one that has the same parent as this node. NULL if this node is the last child of the parent element.

Referenced by `CPLAddXMLChild()`, `CPLAddXMLSibling()`, `CPLCloneXMLTree()`, `CPLCreateXMLNode()`, `CPLDestroyXMLNode()`, `CPLGetXMLNode()`, `CPLGetXMLValue()`, `CPLRemoveXMLChild()`, `CPLSearchXMLNode()`, `CPLSerializeXMLTree()`, `CPLSetXMLValue()`, and `CPLStripXMLNamespace()`.

### 16.5.2.4 `char* CPLXMLNode::pszValue`

Node value.

For `CXT_Element` this is the name of the element, without the angle brackets. Note there is a single `CXT_Element` even when the document contains a start and end element tag. The node represents the pair. All text or other elements between the start and end tag will appear as children nodes of this `CXT_Element` node.

For `CXT_Attribute` the `pszValue` is the attribute name. The value of the attribute will be a `CXT_Text` child.

For `CXT_Text` this is the text itself (value of an attribute, or a text fragment between an element start and end tags).

For `CXT_Literal` it is all the literal text. Currently this is just used for `!DOCTYPE` lines, and the value would be the entire line.

For `CXT_Comment` the value is all the literal text within the comment, but not including the comment start/end indicators ("`<--`" and "`-->`").

Referenced by `CPLCloneXMLTree()`, `CPLCreateXMLNode()`, `CPLDestroyXMLNode()`, `CPLGetXMLNode()`, `CPLGetXMLValue()`, `CPLParseXMLString()`, `CPLSearchXMLNode()`, `CPLSetXMLValue()`, and `CPLStripXMLNamespace()`.

The documentation for this struct was generated from the following file:

- `cpl_minixml.h`

## 16.6 OGR\_SRSNode Class Reference

```
#include <ogr_spatialref.h>
```

### Public Member Functions

- **OGR\_SRSNode** (const char \*=NULL)
- int **GetChildCount** () const
- **OGR\_SRSNode \*** **GetChild** (int)
- **OGR\_SRSNode \*** **GetNode** (const char \*)
- void **InsertChild** (**OGR\_SRSNode** \*, int)
- void **AddChild** (**OGR\_SRSNode** \*)
- int **FindChild** (const char \*) const
- void **DestroyChild** (int)
- void **StripNodes** (const char \*)
- const char \* **GetValue** () const
- void **SetValue** (const char \*)
- void **MakeValueSafe** ()
- **OGR\_SRSNode \*** **Clone** () const
- OGRErr **importFromWkt** (char \*\*)
- OGRErr **exportToWkt** (char \*\*) const
- OGRErr **applyRemapper** (const char \*pszNode, char \*\*papszSrcValues, char \*\*papszDstValues, int nStepSize=1, int bChildOfHit=FALSE)

### 16.6.1 Detailed Description

Objects of this class are used to represent value nodes in the parsed representation of the WKT SRS format. For instance UNIT["METER",1] would be rendered into three OGR\_SRSNodes. The root node would have a value of UNIT, and two children, the first with a value of METER, and the second with a value of 1.

Normally application code just interacts with the **OGRSpatialReference** (p. 217) object, which uses the **OGR\_SRSNode** (p. 79) to implement it's data structure; however, this class is user accessible for detailed access to components of an SRS definition.

### 16.6.2 Constructor & Destructor Documentation

#### 16.6.2.1 OGR\_SRSNode::OGR\_SRSNode (const char \* *pszValueIn* = NULL)

Constructor.

#### Parameters:

*pszValueIn* this optional parameter can be used to initialize the value of the node upon creation. If omitted the node will be created with a value of "". Newly created OGR\_SRSNodes have no children.

Referenced by Clone(), and importFromWkt().

### 16.6.3 Member Function Documentation

#### 16.6.3.1 void OGR\_SRSNode::AddChild (OGR\_SRSNode \* *poNew*)

Add passed node as a child of target node.

Note that ownership of the passed node is assumed by the node on which the method is invoked ... use the **Clone()** (p. 80) method if the original is to be preserved. New children are always added at the end of the list.

##### Parameters:

*poNew* the node to add as a child.

References InsertChild().

Referenced by Clone(), importFromWkt(), OGRSpatialReference::SetAngularUnits(), OGRSpatialReference::SetAuthority(), OGRSpatialReference::SetGeogCS(), OGRSpatialReference::SetLinearUnits(), OGRSpatialReference::SetNode(), OGRSpatialReference::SetProjParm(), and OGRSpatialReference::SetTOWGS84().

#### 16.6.3.2 OGRErr OGR\_SRSNode::applyRemapper (const char \* *pszNode*, char \*\* *papszSrcValues*, char \*\* *papszDstValues*, int *nStepSize* = 1, int *bChildOfHit* = FALSE)

Remap node values matching list.

Remap the value of this node or any of it's children if it matches one of the values in the source list to the corresponding value from the destination list. If the *pszNode* value is set, only do so if the parent node matches that value. Even if a replacement occurs, searching continues.

##### Parameters:

*pszNode* Restrict remapping to children of this type of node (eg. "PROJECTION")

*papszSrcValues* a NULL terminated array of source string. If the node value matches one of these (case insensitive) then replacement occurs.

*papszDstValues* an array of destination strings. On a match, the one corresponding to a source value will be used to replace a node.

*nStepSize* increment when stepping through source and destination arrays, allowing source and destination arrays to be one interleaved array for instances. Defaults to 1.

*bChildOfHit* Only TRUE if we the current node is the child of a match, and so needs to be set. Application code would normally pass FALSE for this argument.

##### Returns:

returns OGRErr\_NONE unless something bad happens. There is no indication returned about whether any replacement occurred.

References applyRemapper(), GetChild(), GetChildCount(), and SetValue().

Referenced by applyRemapper(), OGRSpatialReference::morphFromESRI(), and OGRSpatialReference::morphToESRI().

#### 16.6.3.3 OGR\_SRSNode \* OGR\_SRSNode::Clone () const

Make a duplicate of this node, and it's children.

**Returns:**

a new node tree, which becomes the responsibility of the caller.

References AddChild(), and OGR\_SRSNode().

Referenced by OGRSpatialReference::Clone(), and OGRSpatialReference::CopyGeogCSFrom().

**16.6.3.4 void OGR\_SRSNode::DestroyChild (int *iChild*)**

Remove a child node, and it's subtree.

Note that removing a child node will result in children after it being renumbered down one.

**Parameters:**

*iChild* the index of the child.

Referenced by OGRSpatialReference::CopyGeogCSFrom(), OGRSpatialReference::importFromESRI(), OGRSpatialReference::morphToESRI(), OGRSpatialReference::SetAuthority(), OGRSpatialReference::SetGeogCS(), OGRSpatialReference::SetLinearUnits(), OGRSpatialReference::SetStatePlane(), OGRSpatialReference::SetTOWGS84(), and StripNodes().

**16.6.3.5 OGRErr OGR\_SRSNode::exportToWkt (char \*\* *ppszResult*) const**

Convert this tree of nodes into WKT format.

Note that the returned WKT string should be freed with OGRFree() or CPLFree() when no longer needed. It is the responsibility of the caller.

**Parameters:**

*ppszResult* the resulting string is returned in this pointer.

**Returns:**

currently OGRERR\_NONE is always returned, but the future it is possible error conditions will develop.

References exportToWkt().

Referenced by OGRSpatialReference::exportToWkt(), and exportToWkt().

**16.6.3.6 int OGR\_SRSNode::FindChild (const char \* *pszValue*) const**

Find the index of the child matching the given string.

Note that the node value must match pszValue with the exception of case. The comparison is case insensitive.

**Parameters:**

*pszValue* the node value being searched for.

**Returns:**

the child index, or -1 on failure.

Referenced by `OGRSpatialReference::CopyGeogCSFrom()`, `OGRSpatialReference::Fixup()`, `OGRSpatialReference::GetAuthorityCode()`, `OGRSpatialReference::GetAuthorityName()`, `OGRSpatialReference::SetAngularUnits()`, `OGRSpatialReference::SetAuthority()`, `OGRSpatialReference::SetGeogCS()`, `OGRSpatialReference::SetLinearUnits()`, `OGRSpatialReference::SetStatePlane()`, `OGRSpatialReference::SetTOWGS84()`, and `StripNodes()`.

### 16.6.3.7 `OGR_SRSNode * OGR_SRSNode::GetChild (int iChild)`

Fetch requested child.

#### Parameters:

*iChild* the index of the child to fetch, from 0 to `GetChildCount()` (p. 82) - 1.

#### Returns:

a pointer to the child `OGR_SRSNode` (p. 79), or NULL if there is no such child.

Referenced by `applyRemapper()`, `OGRSpatialReference::exportToPCI()`, `OGRSpatialReference::exportToProj4()`, `OGRSpatialReference::GetAngularUnits()`, `OGRSpatialReference::GetAttrValue()`, `OGRSpatialReference::GetAuthorityCode()`, `OGRSpatialReference::GetAuthorityName()`, `OGRSpatialReference::GetExtension()`, `OGRSpatialReference::GetInvFlattening()`, `OGRSpatialReference::GetLinearUnits()`, `OGRSpatialReference::GetPrimeMeridian()`, `OGRSpatialReference::GetProjParm()`, `OGRSpatialReference::GetSemiMajor()`, `OGRSpatialReference::GetTOWGS84()`, `OGRSpatialReference::importFromProj4()`, `OGRSpatialReference::IsSame()`, `MakeValueSafe()`, `OGRSpatialReference::morphFromESRI()`, `OGRSpatialReference::morphToESRI()`, `OGRSpatialReference::SetAngularUnits()`, `OGRSpatialReference::SetLinearUnits()`, `OGRSpatialReference::SetLinearUnitsAndUpdateParameters()`, `OGRSpatialReference::SetNode()`, `OGRSpatialReference::SetProjParm()`, `StripNodes()`, and `OGRSpatialReference::Validate()`.

### 16.6.3.8 `int OGR_SRSNode::GetChildCount () const [inline]`

Get number of children nodes.

#### Returns:

0 for leaf nodes, or the number of children nodes.

Referenced by `applyRemapper()`, `OGRSpatialReference::exportToPCI()`, `OGRSpatialReference::exportToProj4()`, `OGRSpatialReference::GetAngularUnits()`, `OGRSpatialReference::GetAttrValue()`, `OGRSpatialReference::GetAuthorityCode()`, `OGRSpatialReference::GetAuthorityName()`, `OGRSpatialReference::GetExtension()`, `OGRSpatialReference::GetInvFlattening()`, `OGRSpatialReference::GetLinearUnits()`, `OGRSpatialReference::GetPrimeMeridian()`, `OGRSpatialReference::GetSemiMajor()`, `OGRSpatialReference::GetTOWGS84()`, `OGRSpatialReference::importFromProj4()`, `OGRSpatialReference::IsSame()`, `MakeValueSafe()`, `OGRSpatialReference::morphToESRI()`, `OGRSpatialReference::SetLinearUnitsAndUpdateParameters()`, `OGRSpatialReference::SetNode()`, `OGRSpatialReference::SetProjParm()`, `OGRSpatialReference::SetTOWGS84()`, `StripNodes()`, and `OGRSpatialReference::Validate()`.

**16.6.3.9 OGR\_SRSNode \* OGR\_SRSNode::GetNode (const char \* *pszName*)**

Find named node in tree.

This method does a pre-order traversal of the node tree searching for a node with this exact value (case insensitive), and returns it. Leaf nodes are not considered, under the assumption that they are just attribute value nodes.

If a node appears more than once in the tree (such as UNIT for instance), the first encountered will be returned. Use **GetNode()** (p. 83) on a subtree to be more specific.

**Parameters:**

*pszName* the name of the node to search for.

**Returns:**

a pointer to the node found, or NULL if none.

References GetNode().

Referenced by OGRSpatialReference::GetAttrNode(), GetNode(), and OGRSpatialReference::Validate().

**16.6.3.10 const char \* OGR\_SRSNode::GetValue () const [inline]**

Fetch value string for this node.

**Returns:**

A non-NULL string is always returned. The returned pointer is to the internal value of this node, and should not be modified, or freed.

Referenced by OGRSpatialReference::exportToPCI(), OGRSpatialReference::exportToProj4(), OGRSpatialReference::GetAngularUnits(), OGRSpatialReference::GetAttrValue(), OGRSpatialReference::GetAuthorityCode(), OGRSpatialReference::GetAuthorityName(), OGRSpatialReference::GetExtension(), OGRSpatialReference::GetInvFlattening(), OGRSpatialReference::GetLinearUnits(), OGRSpatialReference::GetPrimeMeridian(), OGRSpatialReference::GetProjParm(), OGRSpatialReference::GetSemiMajor(), OGRSpatialReference::GetTOWGS84(), OGRSpatialReference::importFromProj4(), OGRSpatialReference::IsProjected(), OGRSpatialReference::IsSame(), OGRSpatialReference::morphFromESRI(), OGRSpatialReference::morphToESRI(), OGRSpatialReference::SetLinearUnitsAndUpdateParameters(), OGRSpatialReference::SetNode(), OGRSpatialReference::SetProjCS(), OGRSpatialReference::SetProjection(), OGRSpatialReference::SetProjParm(), OGRSpatialReference::StripCTParms(), and OGRSpatialReference::Validate().

**16.6.3.11 OGRErr OGR\_SRSNode::importFromWkt (char \*\* *ppszInput*)**

Import from WKT string.

This method will wipe the existing children and value of this node, and reassign them based on the contents of the passed WKT string. Only as much of the input string as needed to construct this node, and its children is consumed from the input string, and the input string pointer is then updated to point to the remaining (unused) input.

**Parameters:**

*ppszInput* Pointer to pointer to input. The pointer is updated to point to remaining unused input text.

**Returns:**

OGRERR\_NONE if import succeeds, or OGRERR\_CORRUPT\_DATA if it fails for any reason.

References AddChild(), importFromWkt(), OGR\_SRSNode(), and SetValue().

Referenced by OGRSpatialReference::importFromWkt(), and importFromWkt().

**16.6.3.12 void OGR\_SRSNode::InsertChild (OGR\_SRSNode \*poNew, int iChild)**

Insert the passed node as a child of target node, at the indicated position.

Note that ownership of the passed node is assumed by the node on which the method is invoked ... use the **Clone()** (p. 80) method if the original is to be preserved. All existing children at location iChild and beyond are push down one space to make space for the new child.

**Parameters:**

*poNew* the node to add as a child.

*iChild* position to insert, use 0 to insert at the beginning.

References poParent.

Referenced by AddChild(), OGRSpatialReference::CopyGeogCSFrom(), OGRSpatialReference::SetGeogCS(), OGRSpatialReference::SetProjCS(), OGRSpatialReference::SetProjection(), and OGRSpatialReference::SetTOWGS84().

**16.6.3.13 void OGR\_SRSNode::MakeValueSafe ()**

Massage value string, stripping special characters so it will be a database safe string.

The operation is also applies to all subnodes of the current node.

References GetChild(), GetChildCount(), and MakeValueSafe().

Referenced by MakeValueSafe().

**16.6.3.14 void OGR\_SRSNode::SetValue (const char \*pszNewValue)**

Set the node value.

**Parameters:**

*pszNewValue* the new value to assign to this node. The passed string is duplicated and remains the responsibility of the caller.

Referenced by applyRemapper(), importFromWkt(), OGRSpatialReference::morphFromESRI(), OGRSpatialReference::morphToESRI(), OGRSpatialReference::SetAngularUnits(), OGRSpatialReference::SetLinearUnits(), OGRSpatialReference::SetNode(), and OGRSpatialReference::SetProjParm().

**16.6.3.15 void OGR\_SRSNode::StripNodes (const char \*pszName)**

Strip child nodes matching name.

Removes any decendent nodes of this node that match the given name. Of course children of removed nodes are also discarded.

**Parameters:**

*pszName* the name for nodes that should be removed.

References DestroyChild(), FindChild(), GetChild(), GetChildCount(), and StripNodes().

Referenced by OGRSpatialReference::StripCTParms(), and StripNodes().

The documentation for this class was generated from the following files:

- **ogr\_spatialref.h**
- ogr\_srsnode.cpp

## 16.7 OGRCoordinateTransformation Class Reference

```
#include <ogr_spatialref.h>
```

Inherited by OGRProj4CT.

### Public Member Functions

- virtual **OGRSpatialReference** \* **GetSourceCS** ()=0
- virtual **OGRSpatialReference** \* **GetTargetCS** ()=0
- virtual int **Transform** (int nCount, double \*x, double \*y, double \*z=NULL)=0
- virtual int **TransformEx** (int nCount, double \*x, double \*y, double \*z=NULL, int \*pabSuccess=NULL)=0

### 16.7.1 Detailed Description

Object for transforming between coordinate systems.

Also, see OGRCreateSpatialReference() for creating transformations.

### 16.7.2 Member Function Documentation

#### 16.7.2.1 virtual OGRSpatialReference\* OGRCoordinateTransformation::GetSourceCS () [pure virtual]

Fetch internal source coordinate system.

#### 16.7.2.2 virtual OGRSpatialReference\* OGRCoordinateTransformation::GetTargetCS () [pure virtual]

Fetch internal target coordinate system.

Referenced by OGRPolygon::transform(), OGRPoint::transform(), OGRLineString::transform(), and OGRGeometryCollection::transform().

#### 16.7.2.3 virtual int OGRCoordinateTransformation::Transform (int nCount, double \*x, double \*y, double \*z = NULL) [pure virtual]

Transform points from source to destination space.

This method is the same as the C function OCTTransform().

The method **TransformEx**() (p. 87) allows extended success information to be captured indicating which points failed to transform.

#### Parameters:

- nCount* number of points to transform.
- x* array of nCount X vertices, modified in place.
- y* array of nCount Y vertices, modified in place.
- z* array of nCount Z vertices, modified in place.

**Returns:**

TRUE on success, or FALSE if some or all points fail to transform.

Referenced by OGRPoint::transform(), and OGRLineString::transform().

**16.7.2.4 virtual int OGRCoordinateTransformation::TransformEx (int *nCount*, double \* *x*, double \* *y*, double \* *z* = NULL, int \* *pabSuccess* = NULL) [pure virtual]**

Transform points from source to destination space.

This method is the same as the C function OCTTransformEx().

**Parameters:**

*nCount* number of points to transform.

*x* array of nCount X vertices, modified in place.

*y* array of nCount Y vertices, modified in place.

*z* array of nCount Z vertices, modified in place.

*pabSuccess* array of per-point flags set to TRUE if that point transforms, or FALSE if it does not.

**Returns:**

TRUE if some or all points transform successfully, or FALSE if if none transform.

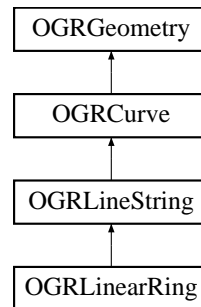
The documentation for this class was generated from the following file:

- **ogr\_spatialref.h**

## 16.8 OGRCurve Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRCurve::



### Public Member Functions

- virtual double **get\_Length** () const =0
- virtual void **StartPoint** (OGRPoint \*) const =0
- virtual void **EndPoint** (OGRPoint \*) const =0
- virtual int **get\_IsClosed** () const
- virtual void **Value** (double, OGRPoint \*) const =0

### 16.8.1 Detailed Description

Abstract curve base class.

### 16.8.2 Member Function Documentation

#### 16.8.2.1 void OGRCurve::EndPoint (OGRPoint \* *poPoint*) const [pure virtual]

Return the curve end point.

This method relates to the SF COM ICurve::get\_EndPoint() method.

#### Parameters:

*poPoint* the point to be assigned the end location.

Implemented in **OGRLineString** (p. 173).

Referenced by get\_IsClosed().

#### 16.8.2.2 int OGRCurve::get\_IsClosed () const [virtual]

Return TRUE if curve is closed.

Tests if a curve is closed. A curve is closed if its start point is equal to its end point.

This method relates to the SF COM ICurve::get\_IsClosed() method.

---

**Returns:**

TRUE if closed, else FALSE.

References EndPoint(), OGRPoint::getX(), OGRPoint::getY(), and StartPoint().

**16.8.2.3 double OGRCurve::get\_Length () const** [pure virtual]

Returns the length of the curve.

This method relates to the SF COM ICurve::get\_Length() method.

**Returns:**

the length of the curve, zero if the curve hasn't been initialized.

Implemented in **OGRLineString** (p. 175).

**16.8.2.4 void OGRCurve::StartPoint (OGRPoint \* *poPoint*) const** [pure virtual]

Return the curve start point.

This method relates to the SF COM ICurve::get\_StartPoint() method.

**Parameters:**

*poPoint* the point to be assigned the start location.

Implemented in **OGRLineString** (p. 181).

Referenced by get\_IsClosed().

**16.8.2.5 void OGRCurve::Value (double *dfDistance*, OGRPoint \* *poPoint*) const** [pure virtual]

Fetch point at given distance along curve.

This method relates to the SF COM ICurve::get\_Value() method.

**Parameters:**

*dfDistance* distance along the curve at which to sample position. This distance should be between zero and **get\_Length()** (p. 89) for this curve.

*poPoint* the point to be assigned the curve position.

Implemented in **OGRLineString** (p. 182).

The documentation for this class was generated from the following files:

- ogr\_geometry.h
- ogrcurve.cpp

## 16.9 OGRDataSource Class Reference

```
#include <ogr_sfrmts.h>
```

### Public Member Functions

- virtual const char \* **GetName** ()=0
- virtual int **GetLayerCount** ()=0
- virtual **OGRLayer** \* **GetLayer** (int)=0
- virtual **OGRLayer** \* **GetLayerByName** (const char \*)
- virtual **OGRerr** **DeleteLayer** (int)
- virtual int **TestCapability** (const char \*)=0
- virtual **OGRLayer** \* **CreateLayer** (const char \*pszName, **OGRSpatialReference** \*poSpatialRef=NULL, **OGRwkbGeometryType** eGType=wkbUnknown, char \*\*papszOptions=NULL)
- **OGRStyleTable** \* **GetStyleTable** ()
- void **SetStyleTableDirectly** (**OGRStyleTable** \*poStyleTable)
- void **SetStyleTable** (**OGRStyleTable** \*poStyleTable)
- virtual **OGRLayer** \* **ExecuteSQL** (const char \*pszStatement, **OGRGeometry** \*poSpatialFilter, const char \*pszDialect)
- virtual void **ReleaseResultSet** (**OGRLayer** \*poResultSet)
- virtual **OGRerr** **SyncToDisk** ()
- int **Reference** ()
- int **Dereference** ()
- int **GetRefCount** () const
- int **GetSummaryRefCount** () const
- **OGRerr** **Release** ()
- **OGRSFDriver** \* **GetDriver** () const
- void **SetDriver** (**OGRSFDriver** \*poDriver)

### Friends

- class **OGRSFDriverRegistrar**

#### 16.9.1 Detailed Description

This class represents a data source. A data source potentially consists of many layers (**OGRLayer** (p. 156)). A data source normally consists of one, or a related set of files, though the name doesn't have to be a real item in the file system.

When an **OGRDataSource** (p. 90) is destroyed, all it's associated **OGRLayers** objects are also destroyed.

#### 16.9.2 Member Function Documentation

**16.9.2.1 OGRLayer \* OGRDataSource::CreateLayer** (const char \* *pszName*, **OGRSpatialReference** \* *poSpatialRef* = NULL, **OGRwkbGeometryType** *eGType* = wkbUnknown, char \*\* *papszOptions* = NULL) [virtual]

This method attempts to create a new layer on the data source with the indicated name, coordinate system, geometry type. The *papszOptions* argument can be used to control driver specific creation options. These options are normally documented in the format specific documentation.

**Parameters:**

*pszName* the name for the new layer. This should ideally not match any existing layer on the data-source.

*poSpatialRef* the coordinate system to use for the new layer, or NULL if no coordinate system is available.

*eGType* the geometry type for the layer. Use wkbUnknown if there are no constraints on the types geometry to be written.

*papszOptions* a StringList of name=value options. Options are driver specific.

**Returns:**

NULL is returned on failure, or a new **OGRLayer** (p. 156) handle on success.

**Example:**

```
#include "ogr_sfrmts.h"
#include "cpl_string.h"

...

OGRLayer *poLayer;
char      *papszOptions;

if( !poDS->TestCapability( ODSCreateLayer ) )
{
    ...
}

papszOptions = CSLSetNameValue( papszOptions, "DIM", "2" );
poLayer = poDS->CreateLayer( "NewLayer", NULL, wkbUnknown,
                             papszOptions );
CSLDestroy( papszOptions );

if( poLayer == NULL )
{
    ...
}
```

**16.9.2.2 OGRErr OGRDataSource::DeleteLayer (int iLayer) [virtual]**

Delete the indicated layer from the datasource. If this method is supported the ODSDeleteLayer capability will test TRUE on the **OGRDataSource** (p. 90).

This method is the same as the C function OGR\_DS\_DeleteLayer().

**Parameters:**

*iLayer* the index of the layer to delete.

**Returns:**

OGRERR\_NONE on success, or OGRERR\_UNSUPPORTED\_OPERATION if deleting layers is not supported for this datasource.

### 16.9.2.3 int OGRDataSource::Dereference ()

Decrement datasource reference count.

This method is the same as the C function `OGR_DS_Dereference()`.

#### Returns:

the reference count after decrementing.

Referenced by `ExecuteSQL()`.

### 16.9.2.4 OGRLayer \* OGRDataSource::ExecuteSQL (const char \* *pszStatement*, OGRGeometry \* *poSpatialFilter*, const char \* *pszDialect*) [virtual]

Execute an SQL statement against the data store.

The result of an SQL query is either NULL for statements that are in error, or that have no results set, or an **OGRLayer** (p. 156) pointer representing a results set from the query. Note that this **OGRLayer** (p. 156) is in addition to the layers in the data store and must be destroyed with `OGRDataSource::ReleaseResultSet()` before the data source is closed (destroyed).

This method is the same as the C function `OGR_DS_ExecuteSQL()` (p. 328).

For more information on the SQL dialect supported internally by OGR review the `OGR SQL` document. Some drivers (ie. Oracle and PostGIS) pass the SQL directly through to the underlying RDBMS.

#### Parameters:

*pszStatement* the SQL statement to execute.

*poSpatialFilter* geometry which represents a spatial filter.

*pszDialect* allows control of the statement dialect. By default it is assumed to be "generic" SQL, whatever that is.

#### Returns:

an **OGRLayer** (p. 156) containing the results of the query. Deallocate with `ReleaseResultSet()`.

References `Dereference()`, `OGRFeatureDefn::GetFieldCount()`, `OGRFeatureDefn::GetFieldDefn()`, `GetLayerByName()`, `OGRLayer::GetLayerDefn()`, `OGRFieldDefn::GetNameRef()`, `OGRFieldDefn::GetType()`, `OFTInteger`, `OFTReal`, and `OFTString`.

### 16.9.2.5 OGRSFDriver \* OGRDataSource::GetDriver () const

Returns the driver that the dataset was opened with.

This method is the same as the C function `OGR_DS_GetDriver()`.

#### Returns:

NULL if driver info is not available, or pointer to a driver owned by the `OGRSFDriverManager`.

Referenced by `OGR_Dr_CreateDataSource()`, `OGR_Dr_Open()`, and `OGRSFDriverRegistrar::Open()`.

---

**16.9.2.6 OGRLayer \* OGRDataSource::GetLayer (int iLayer)** [pure virtual]

Fetch a layer by index. The returned layer remains owned by the **OGRDataSource** (p. 90) and should not be deleted by the application.

This method is the same as the C function **OGR\_DS\_GetLayer()** (p. 328).

**Parameters:**

*iLayer* a layer number between 0 and **GetLayerCount()** (p. 93)-1.

**Returns:**

the layer, or NULL if iLayer is out of range or an error occurs.

Referenced by **GetLayerByName()**, **GetSummaryRefCount()**, and **SyncToDisk()**.

**16.9.2.7 OGRLayer \* OGRDataSource::GetLayerByName (const char \* pszLayerName)**  
[virtual]

Fetch a layer by name. The returned layer remains owned by the **OGRDataSource** (p. 90) and should not be deleted by the application.

This method is the same as the C function **OGR\_DS\_GetLayerByName()** (p. 329).

**Parameters:**

*pszLayerName* the layer name of the layer to fetch.

**Returns:**

the layer, or NULL if Layer is not found or an error occurs.

References **GetLayer()**, **GetLayerCount()**, **OGRLayer::GetLayerDefn()**, and **OGRFeatureDefn::GetName()**.

Referenced by **ExecuteSQL()**.

**16.9.2.8 int OGRDataSource::GetLayerCount ()** [pure virtual]

Get the number of layers in this data source.

This method is the same as the C function **OGR\_DS\_GetLayerCount()** (p. 329).

**Returns:**

layer count.

Referenced by **GetLayerByName()**, **GetSummaryRefCount()**, and **SyncToDisk()**.

**16.9.2.9 const char \* OGRDataSource::GetName ()** [pure virtual]

Returns the name of the data source. This string should be sufficient to open the data source if passed to the same **OGRSFDriver** (p. 211) that this data source was opened with, but it need not be exactly the same string that was used to open the data source. Normally this is a filename.

This method is the same as the C function **OGR\_DS\_GetName()** (p. 329).

---

**Returns:**

pointer to an internal name string which should not be modified or freed by the caller.

**16.9.2.10 int OGRDataSource::GetRefCount () const**

Fetch reference count.

This method is the same as the C function OGR\_DS\_GetRefCount().

**Returns:**

the current reference count for the datasource object itself.

**16.9.2.11 void OGRDataSource::GetStyleTable () [inline]**

Returns data source style table.

This method is the same as the C function OGR\_DS\_GetStyleTable().

**Returns:**

pointer to a style table which should not be modified or freed by the caller.

**16.9.2.12 int OGRDataSource::GetSummaryRefCount () const**

Fetch reference count of datasource and all owned layers.

This method is the same as the C function OGR\_DS\_GetSummaryRefCount().

**Returns:**

the current summary reference count for the datasource and its layers.

References GetLayer(), GetLayerCount(), and OGRLayer::GetRefCount().

**16.9.2.13 int OGRDataSource::Reference ()**

Increment datasource reference count.

This method is the same as the C function OGR\_DS\_Reference().

**Returns:**

the reference count after incrementing.

Referenced by OGRSFDriverRegistrar::Open().

---

**16.9.2.14 OGRErr OGRDataSource::Release ()**

Drop a reference to this datasource, and if the reference count drops to zero close (destroy) the datasource. Internally this actually calls the `OGRSFDriverRegistry::ReleaseDataSource()` method. This method is essentially a convenient alias.

This method is the same as the C function `OGRReleaseDataSource()`.

**Returns:**

`OGRErr_NONE` on success or an error code.

References `OGRSFDriverRegistrar::GetRegistrar()`, and `OGRSFDriverRegistrar::ReleaseDataSource()`.

**16.9.2.15 void OGRDataSource::ReleaseResultSet (OGRLayer \* *poResultSet*) [virtual]**

Release results of `ExecuteSQL()` (p. 92).

This method should only be used to deallocate `OGRLayers` resulting from an `ExecuteSQL()` (p. 92) call on the same **OGRDataSource** (p. 90). Failure to deallocate a results set before destroying the **OGRDataSource** (p. 90) may cause errors.

This method is the same as the C function `OGR_L_ReleaseResultSet()`.

**Parameters:**

*poResultSet* the result of a previous `ExecuteSQL()` (p. 92) call.

**16.9.2.16 void OGRDataSource::SetDriver (OGRSFDriver \* *poDriver*)**

Sets the driver that the dataset was created or opened with.

**Note:**

This method is not exposed as the OGR C API function.

**Parameters:**

*poDriver* pointer to driver instance associated with the data source.

Referenced by `OGR_Dr_CreateDataSource()`, and `OGR_Dr_Open()`.

**16.9.2.17 void OGRDataSource::SetStyleTable (OGRStyleTable \* *poStyleTable*) [inline]**

Set data source style table.

This method operate exactly as `OGRDataSource::SetStyleTableDirectly()` (p. 96) except that it does not assume ownership of the passed table.

This method is the same as the C function `OGR_DS_SetStyleTable()`.

**Parameters:**

*poStyleTable* pointer to style table to set

### 16.9.2.18 void OGRDataSource::SetStyleTableDirectly (OGRStyleTable \* *poStyleTable*) [inline]

Set data source style table.

This method operate exactly as **OGRDataSource::SetStyleTable()** (p. 95) except that it assumes ownership of the passed table.

This method is the same as the C function **OGR\_DS\_SetStyleTableDirectly()**.

#### Parameters:

*poStyleTable* pointer to style table to set

### 16.9.2.19 OGRErr OGRDataSource::SyncToDisk () [virtual]

Flush pending changes to disk.

This call is intended to force the datasource to flush any pending writes to disk, and leave the disk file in a consistent state. It would not normally have any effect on read-only datasources.

Some data sources do not implement this method, and will still return OGRErr\_NONE. An error is only returned if an error occurs while attempting to flush to disk.

The default implementation of this method just calls the **SyncToDisk()** (p. 96) method on each of the layers. Conceptionally, calling **SyncToDisk()** (p. 96) on a datasource should include any work that might be accomplished by calling **SyncToDisk()** (p. 96) on layers in that data source.

This method is the same as the C function **OGR\_DS\_SyncToDisk()**.

#### Returns:

OGRErr\_NONE if no error occurs (even if nothing is done) or an error code.

References **GetLayer()**, **GetLayerCount()**, and **OGRLayer::SyncToDisk()**.

### 16.9.2.20 int OGRDataSource::TestCapability (const char \* *pszCapability*) [pure virtual]

Test if capability is available.

One of the following data source capability names can be passed into this method, and a TRUE or FALSE value will be returned indicating whether or not the capability is available for this object.

- **ODsCreateLayer**: True if this datasource can create new layers.

The define macro forms of the capability names should be used in preference to the strings themselves to avoid misspelling.

This method is the same as the C function **OGR\_DS\_TestCapability()** (p. 330).

#### Parameters:

*pszCapability* the capability to test.

#### Returns:

TRUE if capability available otherwise FALSE.

---

---

The documentation for this class was generated from the following files:

- **ogrsf\_frmts.h**
- ogrsf\_frmts.dox
- ogrdatasource.cpp

## 16.10 OGREnvelope Class Reference

```
#include <ogr_core.h>
```

### 16.10.1 Detailed Description

Simple container for a bounding region.

The documentation for this class was generated from the following file:

- **ogr\_core.h**

## 16.11 OGRFeature Class Reference

```
#include <ogr_feature.h>
```

### Public Member Functions

- **OGRFeature** (**OGRFeatureDefn** \*)
- **OGRFeatureDefn** \* **GetDefnRef** ()
- **OGRErr** **SetGeometryDirectly** (**OGRGeometry** \*)
- **OGRErr** **SetGeometry** (**OGRGeometry** \*)
- **OGRGeometry** \* **GetGeometryRef** ()
- **OGRGeometry** \* **StealGeometry** ()
- **OGRFeature** \* **Clone** ()
- virtual **OGRBoolean** **Equal** (**OGRFeature** \*poFeature)
- int **GetFieldCount** ()
- **OGRFieldDefn** \* **GetFieldDefnRef** (int iField)
- int **GetFieldIndex** (const char \*pszName)
- void **UnsetField** (int iField)
- **OGRField** \* **GetRawFieldRef** (int i)
- int **GetFieldAsInteger** (int i)
- double **GetFieldAsDouble** (int i)
- const char \* **GetFieldAsString** (int i)
- const int \* **GetFieldAsIntegerList** (int i, int \*pnCount)
- const double \* **GetFieldAsDoubleList** (int i, int \*pnCount)
- char \*\* **GetFieldAsStringList** (int i) const
- **GByte** \* **GetFieldAsBinary** (int i, int \*pnCount)
- int **GetFieldAsDateTime** (int i, int \*pnYear, int \*pnMonth, int \*pnDay, int \*pnHour, int \*pnMinute, int \*pnSecond, int \*pnTZFlag)
- void **SetField** (int i, int nValue)
- void **SetField** (int i, double dfValue)
- void **SetField** (int i, const char \*pszValue)
- void **SetField** (int i, int nCount, int \*panValues)
- void **SetField** (int i, int nCount, double \*padfValues)
- void **SetField** (int i, char \*\*papszValues)
- void **SetField** (int i, **OGRField** \*puValue)
- void **SetField** (int i, int nCount, **GByte** \*pabyBinary)
- void **SetField** (int i, int nYear, int nMonth, int nDay, int nHour=0, int nMinute=0, int nSecond=0, int nTZFlag=0)
- long **GetFID** ()
- virtual **OGRErr** **SetFID** (long nFID)
- void **DumpReadable** (**FILE** \*)
- **OGRErr** **SetFrom** (**OGRFeature** \*, int=TRUE)
- virtual const char \* **GetStyleString** ()
- virtual void **SetStyleString** (const char \*)
- virtual void **SetStyleStringDirectly** (char \*)

### Static Public Member Functions

- static **OGRFeature** \* **CreateFeature** (**OGRFeatureDefn** \*)
- static void **DestroyFeature** (**OGRFeature** \*)

### 16.11.1 Detailed Description

A simple feature, including geometry and attributes.

### 16.11.2 Constructor & Destructor Documentation

#### 16.11.2.1 OGRFeature::OGRFeature (OGRFeatureDefn \* *poDefnIn*)

Constructor

Note that the **OGRFeature** (p. 99) will increment the reference count of it's defining **OGRFeatureDefn** (p. 113). Destruction of the **OGRFeatureDefn** (p. 113) before destruction of all OGRFeatures that depend on it is likely to result in a crash.

This method is the same as the C function **OGR\_F\_Create()** (p. 331).

#### Parameters:

*poDefnIn* feature class (layer) definition to which the feature will adhere.

References **OGRFeatureDefn::GetFieldCount()**, **OGRField::nMarker1**, **OGRField::nMarker2**, **OGRFeatureDefn::Reference()**, and **OGRField::Set**.

Referenced by **Clone()**, and **CreateFeature()**.

### 16.11.3 Member Function Documentation

#### 16.11.3.1 OGRFeature \* OGRFeature::Clone ()

Duplicate feature.

The newly created feature is owned by the caller, and will have it's own reference to the **OGRFeatureDefn** (p. 113).

This method is the same as the C function **OGR\_F\_Clone()** (p. 331).

#### Returns:

new feature, exactly matching this feature.

References **GetFID()**, **OGRFeatureDefn::GetFieldCount()**, **GetStyleString()**, **OGRFeature()**, **SetFID()**, **SetField()**, **SetGeometry()**, and **SetStyleString()**.

#### 16.11.3.2 OGRFeature \* OGRFeature::CreateFeature (OGRFeatureDefn \* *poDefn*) [static]

Feature factory.

This is essentially a feature factory, useful for applications creating features but wanting to ensure they are created out of the OGR/GDAL heap.

#### Parameters:

*poDefn* Feature definition defining schema.

**Returns:**

new feature object with null fields and no geometry. May be deleted with delete.

References OGRFeature().

**16.11.3.3 void OGRFeature::DestroyFeature (OGRFeature \* *poFeature*) [static]**

Destroy feature

The feature is deleted, but within the context of the GDAL/OGR heap. This is necessary when higher level applications use GDAL/OGR from a DLL and they want to delete a feature created within the DLL. If the delete is done in the calling application the memory will be freed onto the application heap which is inappropriate.

This method is the same as the C function **OGR\_F\_Destroy()** (p. 331).

**Parameters:**

*poFeature* the feature to delete.

**16.11.3.4 void OGRFeature::DumpReadable (FILE \* *fpOut*)**

Dump this feature in a human readable form.

This dumps the attributes, and geometry; however, it doesn't definition information (other than field types and names), nor does it report the geometry spatial reference system.

This method is the same as the C function **OGR\_F\_DumpReadable()** (p. 332).

**Parameters:**

*fpOut* the stream to write to, such as stdout. If NULL stdout will be used.

References OGRGeometry::dumpReadable(), GetFID(), GetFieldAsString(), GetFieldCount(), OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetFieldType(), OGRFeatureDefn::GetName(), OGRFieldDefn::GetNameRef(), GetStyleString(), and OGRFieldDefn::GetType().

**16.11.3.5 OGRBoolean OGRFeature::Equal (OGRFeature \* *poFeature*) [virtual]**

Test if two features are the same.

Two features are considered equal if they share them (pointer equality) same **OGRFeatureDefn** (p. 113), have the same field values, and the same geometry (as tested by OGRGeometry::Equal()) as well as the same feature id.

This method is the same as the C function **OGR\_F\_Equal()** (p. 332).

**Parameters:**

*poFeature* the other feature to test this one against.

**Returns:**

TRUE if they are equal, otherwise FALSE.

References OGRGeometry::Equals(), GetDefnRef(), GetFID(), and GetGeometryRef().

---

### 16.11.3.6 **OGRFeatureDefn \* OGRFeature::GetDefnRef()** [inline]

Fetch feature definition.

This method is the same as the C function **OGR\_F\_GetDefnRef()** (p. 332).

#### Returns:

a reference to the feature definition object.

Referenced by Equal().

### 16.11.3.7 **long OGRFeature::GetFID()** [inline]

Get feature identifier.

This method is the same as the C function **OGR\_F\_GetFID()** (p. 333).

#### Returns:

feature id or OGRNullFID if none has been assigned.

Referenced by Clone(), DumpReadable(), Equal(), OGRLayer::GetFeature(), GetFieldAsDouble(), GetFieldAsInteger(), and GetFieldAsString().

### 16.11.3.8 **GByte \* OGRFeature::GetFieldAsBinary(int iField, int \* pnBytes)**

Fetch field value as binary data.

Currently this method only works for OFTBinary fields.

This method is the same as the C function **OGR\_F\_GetFieldAsBinary()** (p. 333).

#### Parameters:

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

*pnBytes* location to put the number of bytes returned.

#### Returns:

the field value. This data is internal, and should not be modified, or freed. It's lifetime may be very brief.

References **OGRField::Binary**, **OGRFeatureDefn::GetFieldDefn()**, **OGRFieldDefn::GetType()**, **OGRField::nCount**, **OFTBinary**, and **OGRField::pData**.

### 16.11.3.9 **int OGRFeature::GetFieldAsDateTime(int iField, int \* pnYear, int \* pnMonth, int \* pnDay, int \* pnHour, int \* pnMinute, int \* pnSecond, int \* pnTZFlag)**

Fetch field value as date and time.

Currently this method only works for OFTDate, OFTTime and OFTDateTime fields.

This method is the same as the C function **OGR\_F\_GetFieldAsDateTime()** (p. 333).

---

**Parameters:**

- iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.
- int* *pnYear* (including century)
- int* *pnMonth* (1-12)
- int* *pnDay* (1-31)
- int* *pnHour* (0-23)
- int* *pnMinute* (0-59)
- int* *pnSecond* (0-59)
- int* *pnTZFlag* (0=unknown, 1=localtime, 100=GMT, see data model for details)

**Returns:**

TRUE on success or FALSE on failure.

References OGRField::Date, OGRField::Day, OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::Hour, OGRField::Minute, OGRField::Month, OFTDate, OFTDateTime, OFTTime, OGRField::Second, OGRField::TZFlag, and OGRField::Year.

**16.11.3.10 double OGRFeature::GetFieldAsDouble (int iField)**

Fetch field value as a double.

OFTString features will be translated using atof(). OFTInteger fields will be cast to double. Other field types, or errors will result in a return value of zero.

This method is the same as the C function **OGR\_F\_GetFieldAsDouble()** (p. 334).

**Parameters:**

- iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the field value.

References GetFID(), OGRFeatureDefn::GetFieldCount(), OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OFTInteger, OFTReal, and OFTString.

Referenced by SetFrom().

**16.11.3.11 const double \* OGRFeature::GetFieldAsDoubleList (int iField, int \* pnCount)**

Fetch field value as a list of doubles.

Currently this method only works for OFTRealList fields.

This method is the same as the C function **OGR\_F\_GetFieldAsDoubleList()** (p. 334).

**Parameters:**

- iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.
- pnCount* an integer to put the list count (number of doubles) into.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief. If \*pnCount is zero on return the returned pointer may be NULL or non-NULL.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::nCount, OFTRealList, OGRField::paList, and OGRField::RealList.

**16.11.3.12 int OGRFeature::GetFieldAsInteger (int iField)**

Fetch field value as integer.

OFTString features will be translated using atoi(). OFTReal fields will be cast to integer. Other field types, or errors will result in a return value of zero.

This method is the same as the C function **OGR\_F\_GetFieldAsInteger()** (p. 335).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the field value.

References GetFID(), OGRFeatureDefn::GetFieldCount(), OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OFTInteger, OFTReal, OFTString, and OGRField::Real.

Referenced by SetFrom().

**16.11.3.13 const int \* OGRFeature::GetFieldAsIntegerList (int iField, int \* pnCount)**

Fetch field value as a list of integers.

Currently this method only works for OFTIntegerList fields.

This method is the same as the C function **OGR\_F\_GetFieldAsIntegerList()** (p. 335).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

*pnCount* an integer to put the list count (number of integers) into.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief. If \*pnCount is zero on return the returned pointer may be NULL or non-NULL.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::IntegerList, OGRField::nCount, OFTIntegerList, and OGRField::paList.

**16.11.3.14 const char \* OGRFeature::GetFieldAsString (int iField)**

Fetch field value as a string.

OFTReal and OFTInteger fields will be translated to string using sprintf(), but not necessarily using the established formatting rules. Other field types, or errors will result in a return value of zero.

This method is the same as the C function **OGR\_F\_GetFieldAsString()** (p. 335).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the field value. This string is internal, and should not be modified, or freed. It's lifetime may be very brief.

References OGRField::Binary, OGRField::Date, OGRField::Day, OGRGeometry::exportToWkt(), GetFID(), OGRFeatureDefn::GetFieldCount(), OGRFeatureDefn::GetFieldDefn(), OGRGeometry::getGeometryName(), OGRFieldDefn::GetPrecision(), GetStyleString(), OGRFieldDefn::GetType(), OGRFieldDefn::GetWidth(), OGRField::Hour, OGRField::IntegerList, OGRField::Minute, OGRField::Month, OGRField::nCount, OFTBinary, OFTDate, OFTDateTime, OFTInteger, OFTIntegerList, OFTReal, OFTRealList, OFTString, OFTStringList, OFTTime, OGRField::paData, OGRField::paList, OGRField::RealList, OGRField::Second, OGRField::String, OGRField::StringList, OGRField::TZFlag, and OGRField::Year.

Referenced by DumpReadable(), and SetFrom().

**16.11.3.15 char \*\* OGRFeature::GetFieldAsStringList (int *iField*) const**

Fetch field value as a list of strings.

Currently this method only works for OFTStringList fields.

This method is the same as the C function **OGR\_F\_GetFieldAsStringList()** (p. 336).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OFTStringList, OGRField::paList, and OGRField::StringList.

**16.11.3.16 int OGRFeature::GetFieldCount () [inline]**

Fetch number of fields on this feature. This will always be the same as the field count for the **OGRFeatureDefn** (p. 113).

This method is the same as the C function **OGR\_F\_GetFieldCount()** (p. 336).

**Returns:**

count of fields.

Referenced by DumpReadable(), and SetFrom().

**16.11.3.17 OGRFieldDefn \* OGRFeature::GetFieldDefnRef (int *iField*) [inline]**

Fetch definition for this field.

This method is the same as the C function **OGR\_F\_GetFieldDefnRef()** (p. 336).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the field definition (from the **OGRFeatureDefn** (p. 113)). This is an internal reference, and should not be deleted or modified.

Referenced by **SetFrom()**.

**16.11.3.18 int OGRFeature::GetFieldIndex (const char \*pszName) [inline]**

Fetch the field index given field name.

This is a cover for the **OGRFeatureDefn::GetFieldIndex()** (p. 115) method.

This method is the same as the C function **OGR\_F\_GetFieldIndex()** (p. 337).

**Parameters:**

*pszName* the name of the field to search for.

**Returns:**

the field index, or -1 if no matching field is found.

Referenced by **SetFrom()**.

**16.11.3.19 OGRGeometry \* OGRFeature::GetGeometryRef () [inline]**

Fetch pointer to feature geometry.

This method is the same as the C function **OGR\_F\_GetGeometryRef()** (p. 337).

**Returns:**

pointer to internal feature geometry. This object should not be modified.

Referenced by **Equal()**, **OGRLayer::GetExtent()**, and **SetFrom()**.

**16.11.3.20 OGRField \* OGRFeature::GetRawFieldRef (int iField) [inline]**

Fetch a pointer to the internal field value given the index.

This method is the same as the C function **OGR\_F\_GetRawFieldRef()** (p. 337).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

**Returns:**

the returned pointer is to an internal data structure, and should not be freed, or modified.

Referenced by **SetFrom()**.

---

**16.11.3.21 const char \* OGRFeature::GetStyleString () [virtual]**

Fetch style string for this feature.

Set the OGR Feature Style Specification for details on the format of this string, and **ogr\_featurestyle.h** (p. ??) for services available to parse it.

This method is the same as the C function **OGR\_F\_GetStyleString()** (p. 338).

**Returns:**

a reference to a representation in string format, or NULL if there isn't one.

Referenced by Clone(), DumpReadable(), GetFieldAsString(), and SetFrom().

**16.11.3.22 OGRErr OGRFeature::SetFID (long *nFID*) [virtual]**

Set the feature identifier.

For specific types of features this operation may fail on illegal features ids. Generally it always succeeds. Feature ids should be greater than or equal to zero, with the exception of OGRNullFID (-1) indicating that the feature id is unknown.

This method is the same as the C function **OGR\_F\_SetFID()** (p. 338).

**Parameters:**

***nFID*** the new feature identifier value to assign.

**Returns:**

On success OGRErr\_NONE, or on failure some other value.

Referenced by Clone(), and SetFrom().

**16.11.3.23 void OGRFeature::SetField (int *iField*, int *nYear*, int *nMonth*, int *nDay*, int *nHour* = 0, int *nMinute* = 0, int *nSecond* = 0, int *nTZFlag* = 0)**

Set field to date.

This method currently only has an effect for OFTDate, OFTTime and OFTDateTime fields.

This method is the same as the C function **OGR\_F\_SetFieldDateTime()** (p. 339).

**Parameters:**

***iField*** the field to set, from 0 to **GetFieldCount()** (p. 105)-1.

***nYear*** (including century)

***nMonth*** (1-12)

***nDay*** (1-31)

***nHour*** (0-23)

***nMinute*** (0-59)

***nSecond*** (0-59)

***nTZFlag*** (0=unknown, 1=localtime, 100=GMT, see data model for details)

References OGRField::Date, OGRField::Day, OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::Hour, OGRField::Minute, OGRField::Month, OFTDate, OFTDateTime, OFTTime, OGRField::Second, OGRField::TZFlag, and OGRField::Year.

#### 16.11.3.24 void OGRFeature::SetField (int *iField*, int *nBytes*, GByte \* *pabyData*)

Set field to binary data.

This method currently on has an effect of OFTBinary fields.

This method is the same as the C function **OGR\_F\_SetFieldBinary()** (p. 339).

##### Parameters:

***iField*** the field to set, from 0 to **GetFieldCount()** (p. 105)-1.

***nBytes*** bytes of data being set.

***pabyData*** the raw data being applied.

References OGRField::Binary, OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::nCount, OFTBinary, OGRField::paData, and SetField().

#### 16.11.3.25 void OGRFeature::SetField (int *iField*, OGRField \* *puValue*)

Set field.

The passed value **OGRField** (p. 118) must be of exactly the same type as the target field, or an application crash may occur. The passed value is copied, and will not be affected. It remains the responsibility of the caller.

This method is the same as the C function **OGR\_F\_SetFieldRaw()** (p. 341).

##### Parameters:

***iField*** the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

***puValue*** the value to assign.

References OGRField::Binary, OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::IntegerList, OGRField::nCount, OGRField::nMarker1, OGRField::nMarker2, OFTBinary, OFTDate, OFTDateTime, OFTInteger, OFTIntegerList, OFTReal, OFTRealList, OFTString, OFTStringList, OFTTime, OGRField::paData, OGRField::paList, OGRField::RealList, OGRField::Set, OGRField::String, and OGRField::StringList.

#### 16.11.3.26 void OGRFeature::SetField (int *iField*, char \*\* *papszValues*)

Set field to list of strings value.

This method currently on has an effect of OFTStringList fields.

This method is the same as the C function **OGR\_F\_SetFieldStringList()** (p. 342).

##### Parameters:

***iField*** the field to set, from 0 to **GetFieldCount()** (p. 105)-1.

***papszValues*** the values to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::nCount, OFTStringList, OGRField::paList, SetField(), and OGRField::StringList.

---

**16.11.3.27 void OGRFeature::SetField (int *iField*, int *nCount*, double \* *padfValues*)**

Set field to list of doubles value.

This method currently on has an effect of OFTRealList fields.

This method is the same as the C function **OGR\_F\_SetFieldDoubleList()** (p. 340).

**Parameters:**

*iField* the field to set, from 0 to **GetFieldCount()** (p. 105)-1.

*nCount* the number of values in the list being assigned.

*padfValues* the values to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::nCount, OFTRealList, OGRField::paList, OGRField::RealList, and SetField().

**16.11.3.28 void OGRFeature::SetField (int *iField*, int *nCount*, int \* *panValues*)**

Set field to list of integers value.

This method currently on has an effect of OFTIntegerList fields.

This method is the same as the C function **OGR\_F\_SetFieldIntegerList()** (p. 341).

**Parameters:**

*iField* the field to set, from 0 to **GetFieldCount()** (p. 105)-1.

*nCount* the number of values in the list being assigned.

*panValues* the values to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::IntegerList, OGRField::nCount, OFTIntegerList, OGRField::paList, and SetField().

**16.11.3.29 void OGRFeature::SetField (int *iField*, const char \* *pszValue*)**

Set field to string value.

OFTInteger fields will be set based on an atoi() conversion of the string. OFTReal fields will be set based on an atof() conversion of the string. Other field types may be unaffected.

This method is the same as the C function **OGR\_F\_SetFieldString()** (p. 342).

**Parameters:**

*iField* the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

*pszValue* the value to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::Integer, OGRField::nMarker2, OFTDate, OFTDateTime, OFTInteger, OFTReal, OFTString, OFTTime, OGRParseDate(), OGRField::Real, OGRField::Set, and OGRField::String.

---

### 16.11.3.30 void OGRFeature::SetField (int *iField*, double *dfValue*)

Set field to double value.

OFTInteger and OFTReal fields will be set directly. OFTString fields will be assigned a string representation of the value, but not necessarily taking into account formatting constraints on this field. Other field types may be unaffected.

This method is the same as the C function **OGR\_F\_SetFieldDouble()** (p. 340).

#### Parameters:

***iField*** the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

***dfValue*** the value to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::Integer, OGRField::nMarker2, OFTInteger, OFTReal, OFTString, OGRField::Real, OGRField::Set, and OGRField::String.

### 16.11.3.31 void OGRFeature::SetField (int *iField*, int *nValue*)

Set field to integer value.

OFTInteger and OFTReal fields will be set directly. OFTString fields will be assigned a string representation of the value, but not necessarily taking into account formatting constraints on this field. Other field types may be unaffected.

This method is the same as the C function **OGR\_F\_SetFieldInteger()** (p. 340).

#### Parameters:

***iField*** the field to fetch, from 0 to **GetFieldCount()** (p. 105)-1.

***nValue*** the value to assign.

References OGRFeatureDefn::GetFieldDefn(), OGRFieldDefn::GetType(), OGRField::Integer, OGRField::nMarker2, OFTInteger, OFTReal, OFTString, OGRField::Real, OGRField::Set, and OGRField::String.

Referenced by Clone(), SetField(), and SetFrom().

### 16.11.3.32 OGRErr OGRFeature::SetFrom (OGRFeature \* *poSrcFeature*, int *bForgiving* = TRUE)

Set one feature from another.

Overwrite the contents of this feature from the geometry and attributes of another. The *poSrcFeature* does not need to have the same **OGRFeatureDefn** (p. 113). Field values are copied by corresponding field names. Field types do not have to exactly match. **SetField()** (p. 110) method conversion rules will be applied as needed.

This method is the same as the C function **OGR\_F\_SetFrom()** (p. 342).

#### Parameters:

***poSrcFeature*** the feature from which geometry, and field values will be copied.

***bForgiving*** TRUE if the operation should continue despite lacking output fields matching some of the source fields.

**Returns:**

OGRERR\_NONE if the operation succeeds, even if some values are not transferred, otherwise an error code.

References GetFieldAsDouble(), GetFieldAsInteger(), GetFieldAsString(), GetFieldCount(), GetFieldDefnRef(), GetFieldIndex(), GetGeometryRef(), OGRFieldDefn::GetNameRef(), GetRawFieldRef(), GetStyleString(), OGRFieldDefn::GetType(), IsFieldSet(), OFTInteger, OFTReal, OFTString, SetFID(), SetField(), SetGeometry(), SetStyleString(), and UnsetField().

**16.11.3.33 OGRERR OGRFeature::SetGeometry (OGRGeometry \* *poGeomIn*)**

Set feature geometry.

This method updates the features geometry, and operate exactly as **SetGeometryDirectly()** (p. 111), except that this method does not assume ownership of the passed geometry, but instead makes a copy of it.

This method is the same as the C function **OGR\_F\_SetGeometry()** (p. 343).

**Parameters:**

*poGeomIn* new geometry to apply to feature. Passing NULL value here is correct and it will result in deallocation of currently assigned geometry without assigning new one.

**Returns:**

OGRERR\_NONE if successful, or OGR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the **OGRFeatureDefn** (p. 113) (checking not yet implemented).

References OGRGeometry::clone().

Referenced by Clone(), and SetFrom().

**16.11.3.34 OGRERR OGRFeature::SetGeometryDirectly (OGRGeometry \* *poGeomIn*)**

Set feature geometry.

This method updates the features geometry, and operate exactly as **SetGeometry()** (p. 111), except that this method assumes ownership of the passed geometry.

This method is the same as the C function **OGR\_F\_SetGeometryDirectly()** (p. 343).

**Parameters:**

*poGeomIn* new geometry to apply to feature. Passing NULL value here is correct and it will result in deallocation of currently assigned geometry without assigning new one.

**Returns:**

OGRERR\_NONE if successful, or OGR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the **OGRFeatureDefn** (p. 113) (checking not yet implemented).

**16.11.3.35 void OGRFeature::SetStyleString (const char \* *pszString*) [virtual]**

Set feature style string. This method operate exactly as **OGRFeature::SetStyleStringDirectly()** (p. 112) except that it does not assume ownership of the passed string, but instead makes a copy of it.

This method is the same as the C function **OGR\_F\_SetStyleString()** (p. 344).

**Parameters:**

*pszString* the style string to apply to this feature, cannot be NULL.

Referenced by Clone(), and SetFrom().

**16.11.3.36 void OGRFeature::SetStyleStringDirectly (char \*pszString) [virtual]**

Set feature style string. This method operate exactly as **OGRFeature::SetStyleString()** (p. 111) except that it assumes ownership of the passed string.

This method is the same as the C function **OGR\_F\_SetStyleStringDirectly()** (p. 344).

**Parameters:**

*pszString* the style string to apply to this feature, cannot be NULL.

**16.11.3.37 OGRGeometry \* OGRFeature::StealGeometry ()**

Take away ownership of geometry.

Fetch the geometry from this feature, and clear the reference to the geometry on the feature. This is a mechanism for the application to take over ownership of the geometry from the feature without copying. Sort of an inverse to **SetGeometryDirectly()** (p. 111).

After this call the **OGRFeature** (p. 99) will have a NULL geometry.

**Returns:**

the pointer to the geometry.

**16.11.3.38 void OGRFeature::UnsetField (int iField)**

Clear a field, marking it as unset.

This method is the same as the C function **OGR\_F\_UnsetField()** (p. 344).

**Parameters:**

*iField* the field to unset.

References **OGRFeatureDefn::GetFieldDefn()**, **OGRFieldDefn::GetType()**, **OGRField::nMarker1**, **OGRField::nMarker2**, **OFTBinary**, **OFTIntegerList**, **OFTRealList**, **OFTString**, **OFTStringList**, **OGRField::paData**, **OGRField::paList**, and **OGRField::Set**.

Referenced by SetFrom().

The documentation for this class was generated from the following files:

- **ogr\_feature.h**
- **ogrfeature.cpp**

## 16.12 OGRFeatureDefn Class Reference

```
#include <ogr_feature.h>
```

### Public Member Functions

- **OGRFeatureDefn** (const char \*pszName=NULL)
- const char \* **GetName** ()
- int **GetFieldCount** ()
- **OGRFieldDefn** \* **GetFieldDefn** (int i)
- int **GetFieldIndex** (const char \*)
- void **AddFieldDefn** (**OGRFieldDefn** \*)
- **OGRwkbGeometryType** **GetGeomType** ()
- void **SetGeomType** (**OGRwkbGeometryType**)
- **OGRFeatureDefn** \* **Clone** ()
- int **Reference** ()
- int **Dereference** ()
- int **GetReferenceCount** ()
- void **Release** ()

### 16.12.1 Detailed Description

Definition of a feature class or feature layer.

This object contains schema information for a set of OGRFeatures. In table based systems, an **OGRFeatureDefn** (p. 113) is essentially a layer. In more object oriented approaches (such as SF CORBA) this can represent a class of features but doesn't necessarily relate to all of a layer, or just one layer.

This object also can contain some other information such as a name, the base geometry type and potentially other metadata.

It is reasonable for different translators to derive classes from **OGRFeatureDefn** (p. 113) with additional translator specific information.

### 16.12.2 Constructor & Destructor Documentation

#### 16.12.2.1 OGRFeatureDefn::OGRFeatureDefn (const char \*pszName = NULL)

Constructor

The **OGRFeatureDefn** (p. 113) maintains a reference count, but this starts at zero. It is mainly intended to represent a count of OGRFeature's based on this definition.

This method is the same as the C function **OGR\_FD\_Create**() (p. 345).

#### Parameters:

*pszName* the name to be assigned to this layer/class. It does not need to be unique.

References wkbUnknown.

Referenced by Clone().

---

## 16.12.3 Member Function Documentation

### 16.12.3.1 void OGRFeatureDefn::AddFieldDefn (OGRFieldDefn \* *poNewDefn*)

Add a new field definition.

This method should only be called while there are no **OGRFeature** (p. 99) objects in existence based on this **OGRFeatureDefn** (p. 113). The **OGRFieldDefn** (p. 119) passed in is copied, and remains the responsibility of the caller.

This method is the same as the C function **OGR\_FD\_AddFieldDefn()** (p. 344).

#### Parameters:

*poNewDefn* the definition of the new field.

Referenced by Clone().

### 16.12.3.2 OGRFeatureDefn \* OGRFeatureDefn::Clone ()

Create a copy of this feature definition.

Creates a deep copy of the feature definition.

#### Returns:

the copy.

References AddFieldDefn(), GetFieldCount(), GetFieldDefn(), GetGeomType(), GetName(), OGRFeatureDefn(), and SetGeomType().

### 16.12.3.3 int OGRFeatureDefn::Dereference () [inline]

Decrements the reference count by one.

This method is the same as the C function **OGR\_FD\_Dereference()** (p. 345).

#### Returns:

the updated reference count.

Referenced by Release().

### 16.12.3.4 int OGRFeatureDefn::GetFieldCount () [inline]

Fetch number of fields on this feature.

This method is the same as the C function **OGR\_FD\_GetFieldCount()** (p. 346).

#### Returns:

count of fields.

Referenced by Clone(), OGRFeature::Clone(), OGRDataSource::ExecuteSQL(), OGRFeature::GetFieldAsDouble(), OGRFeature::GetFieldAsInteger(), OGRFeature::GetFieldAsString(), and OGRFeature::OGRFeature().

---

**16.12.3.5 OGRFieldDefn \* OGRFeatureDefn::GetFieldDefn (int *iField*)**

Fetch field definition.

This method is the same as the C function **OGR\_FD\_GetFieldDefn()** (p. 346).

**Parameters:**

*iField* the field to fetch, between 0 and **GetFieldCount()** (p. 114)-1.

**Returns:**

a pointer to an internal field definition object. This object should not be modified or freed by the application.

Referenced by **Clone()**, **OGRFeature::DumpReadable()**, **OGRDataSource::ExecuteSQL()**, **OGRFeature::GetFieldAsBinary()**, **OGRFeature::GetFieldAsDateTime()**, **OGRFeature::GetFieldAsDouble()**, **OGRFeature::GetFieldAsDoubleList()**, **OGRFeature::GetFieldAsInteger()**, **OGRFeature::GetFieldAsIntegerList()**, **OGRFeature::GetFieldAsString()**, **OGRFeature::GetFieldAsStringList()**, **OGRFeature::SetField()**, and **OGRFeature::UnsetField()**.

**16.12.3.6 int OGRFeatureDefn::GetFieldIndex (const char \* *pszFieldName*)**

Find field by name.

The field index of the first field matching the passed field name (case insensitively) is returned.

This method is the same as the C function **OGR\_FD\_GetFieldIndex()** (p. 346).

**Parameters:**

*pszFieldName* the field name to search for.

**Returns:**

the field index, or -1 if no match found.

**16.12.3.7 OGRwkbGeometryType OGRFeatureDefn::GetGeomType () [inline]**

Fetch the geometry base type.

Note that some drivers are unable to determine a specific geometry type for a layer, in which case **wkbUnknown** is returned. A value of **wkbNone** indicates no geometry is available for the layer at all. Many drivers do not properly mark the geometry type as 25D even if some or all geometries are in fact 25D. A few (broken) drivers return **wkbPolygon** for layers that also include **wkbMultiPolygon**.

This method is the same as the C function **OGR\_FD\_GetGeomType()** (p. 347).

**Returns:**

the base type for all geometry related to this definition.

Referenced by **Clone()**.

---

**16.12.3.8** `const char * OGRFeatureDefn::GetName () [inline]`

Get name of this **OGRFeatureDefn** (p. 113).

This method is the same as the C function **OGR\_FD\_GetName()** (p. 347).

**Returns:**

the name. This name is internal and should not be modified, or freed.

Referenced by Clone(), OGRFeature::DumpReadable(), and OGRDataSource::GetLayerByName().

**16.12.3.9** `int OGRFeatureDefn::GetReferenceCount () [inline]`

Fetch current reference count.

This method is the same as the C function **OGR\_FD\_GetReferenceCount()** (p. 347).

**Returns:**

the current reference count.

**16.12.3.10** `int OGRFeatureDefn::Reference () [inline]`

Increments the reference count by one.

The reference count is used keep track of the number of **OGRFeature** (p. 99) objects referencing this definition.

This method is the same as the C function **OGR\_FD\_Reference()** (p. 348).

**Returns:**

the updated reference count.

Referenced by OGRFeature::OGRFeature().

**16.12.3.11** `void OGRFeatureDefn::Release ()`

Drop a reference to this object, and destroy if no longer referenced.

References Derefence().

**16.12.3.12** `void OGRFeatureDefn::SetGeomType (OGRwkbGeometryType eNewType)`

Assign the base geometry type for this layer.

All geometry objects using this type must be of the defined type or a derived type. The default upon creation is wkbUnknown which allows for any geometry type. The geometry type should generally not be changed after any OGRFeatures have been created against this definition.

This method is the same as the C function **OGR\_FD\_SetGeomType()** (p. 348).

**Parameters:**

*eNewType* the new type to assign.

---

Referenced by Clone().

The documentation for this class was generated from the following files:

- **ogr\_feature.h**
- ogrfeaturedefn.cpp

## 16.13 OGRField Union Reference

```
#include <ogr_core.h>
```

### 16.13.1 Detailed Description

**OGRFeature** (p. 99) field attribute value union.

The documentation for this union was generated from the following file:

- **ogr\_core.h**

## 16.14 OGRFieldDefn Class Reference

```
#include <ogr_feature.h>
```

### Public Member Functions

- **OGRFieldDefn** (const char \*, **OGRFieldType**)
- **OGRFieldDefn** (**OGRFieldDefn** \*)
- void **SetName** (const char \*)
- const char \* **GetNameRef** ()
- **OGRFieldType** **GetType** ()
- void **SetType** (**OGRFieldType** eTypeIn)
- **OGRJustification** **GetJustify** ()
- void **SetJustify** (**OGRJustification** eJustifyIn)
- int **GetWidth** ()
- void **SetWidth** (int nWidthIn)
- int **GetPrecision** ()
- void **SetPrecision** (int nPrecisionIn)
- void **Set** (const char \*, **OGRFieldType**, int=0, int=0, **OGRJustification**=OJUndefined)
- void **SetDefault** (const **OGRField** \*)

### Static Public Member Functions

- static const char \* **GetFieldTypeName** (**OGRFieldType**)

#### 16.14.1 Detailed Description

Definition of an attribute of an **OGRFeatureDefn** (p. 113).

#### 16.14.2 Constructor & Destructor Documentation

##### 16.14.2.1 OGRFieldDefn::OGRFieldDefn (const char \* *pszNameIn*, **OGRFieldType** *eTypeIn*)

Constructor.

##### Parameters:

*pszNameIn* the name of the new field.

*eTypeIn* the type of the new field.

##### 16.14.2.2 OGRFieldDefn::OGRFieldDefn (**OGRFieldDefn** \* *poPrototype*)

Constructor.

Create by cloning an existing field definition.

##### Parameters:

*poPrototype* the field definition to clone.

---

References `GetJustify()`, `GetNameRef()`, `GetPrecision()`, `GetType()`, `GetWidth()`, `SetJustify()`, `SetPrecision()`, and `SetWidth()`.

### 16.14.3 Member Function Documentation

#### 16.14.3.1 `const char * OGRFieldDefn::GetFieldTypeName (OGRFieldType eType)` [static]

Fetch human readable name for a field type.

This static method is the same as the C function `OGR_GetFieldTypeName()` (p. 367).

##### Parameters:

*eType* the field type to get name for.

##### Returns:

pointer to an internal static name string. It should not be modified or freed.

References `OFTBinary`, `OFTDate`, `OFTDateTime`, `OFTInteger`, `OFTIntegerList`, `OFTReal`, `OFTRealList`, `OFTString`, `OFTStringList`, `OFTTime`, `OFTWideString`, and `OFTWideStringList`.

Referenced by `OGRFeature::DumpReadable()`, and `OGR_GetFieldTypeName()`.

#### 16.14.3.2 `OGRJustification OGRFieldDefn::GetJustify ()` [inline]

Get the justification for this field.

This method is the same as the C function `OGR_Fld_GetJustify()` (p. 349).

##### Returns:

the justification.

Referenced by `OGRFieldDefn()`.

#### 16.14.3.3 `const char * OGRFieldDefn::GetNameRef ()` [inline]

Fetch name of this field.

This method is the same as the C function `OGR_Fld_GetNameRef()` (p. 349).

##### Returns:

pointer to an internal name string that should not be freed or modified.

Referenced by `OGRFeature::DumpReadable()`, `OGRDataSource::ExecuteSQL()`, `OGRFieldDefn()`, and `OGRFeature::SetFrom()`.

#### 16.14.3.4 `int OGRFieldDefn::GetPrecision ()` [inline]

Get the formatting precision for this field. This should normally be zero for fields of types other than `OFTReal`.

This method is the same as the C function `OGR_Fld_GetPrecision()` (p. 350).

---

**Returns:**

the precision.

Referenced by OGRFeature::GetFieldAsString(), and OGRFieldDefn().

**16.14.3.5 OGRFieldType OGRFieldDefn::GetType () [inline]**

Fetch type of this field.

This method is the same as the C function **OGR\_Fld\_GetType()** (p. 350).

**Returns:**

field type.

Referenced by OGRFeature::DumpReadable(), OGRDataSource::ExecuteSQL(), OGRFeature::GetFieldAsBinary(), OGRFeature::GetFieldAsDateTime(), OGRFeature::GetFieldAsDouble(), OGRFeature::GetFieldAsDoubleList(), OGRFeature::GetFieldAsInteger(), OGRFeature::GetFieldAsIntegerList(), OGRFeature::GetFieldAsString(), OGRFeature::GetFieldAsStringList(), OGRFieldDefn(), OGRFeature::SetField(), OGRFeature::SetFrom(), and OGRFeature::UnsetField().

**16.14.3.6 int OGRFieldDefn::GetWidth () [inline]**

Get the formatting width for this field.

This method is the same as the C function **OGR\_Fld\_GetWidth()** (p. 350).

**Returns:**

the width, zero means no specified width.

Referenced by OGRFeature::GetFieldAsString(), and OGRFieldDefn().

**16.14.3.7 void OGRFieldDefn::Set (const char \* *pszNameIn*, OGRFieldType *eTypeIn*, int *nWidthIn* = 0, int *nPrecisionIn* = 0, OGRJustification *eJustifyIn* = OJUndefined)**

Set defining parameters for a field in one call.

This method is the same as the C function **OGR\_Fld\_Set()** (p. 351).

**Parameters:**

***pszNameIn*** the new name to assign.

***eTypeIn*** the new type (one of the OFT values like OFTInteger).

***nWidthIn*** the preferred formatting width. Defaults to zero indicating undefined.

***nPrecisionIn*** number of decimals places for formatting, defaults to zero indicating undefined.

***eJustifyIn*** the formatting justification (OJLeft or OJRight), defaults to OJUndefined.

References SetJustify(), SetName(), SetPrecision(), SetType(), and SetWidth().

---

**16.14.3.8 void OGRFieldDefn::SetDefault (const OGRField \* *puDefaultIn*)**

Set default field value.

Currently use of **OGRFieldDefn** (p. 119) "defaults" is discouraged. This feature may be fleshed out in the future.

References OFTInteger, OFTReal, and OFTString.

**16.14.3.9 void OGRFieldDefn::SetJustify (OGRJustification *eJustify*)** [inline]

Set the justification for this field.

This method is the same as the C function **OGR\_Fld\_SetJustify()** (p. 351).

**Parameters:**

*eJustify* the new justification.

Referenced by OGRFieldDefn(), and Set().

**16.14.3.10 void OGRFieldDefn::SetName (const char \* *pszNameIn*)**

Reset the name of this field.

This method is the same as the C function **OGR\_Fld\_SetName()** (p. 351).

**Parameters:**

*pszNameIn* the new name to apply.

Referenced by Set().

**16.14.3.11 void OGRFieldDefn::SetPrecision (int *nPrecision*)** [inline]

Set the formatting precision for this field in characters.

This should normally be zero for fields of types other than OFTReal.

This method is the same as the C function **OGR\_Fld\_SetPrecision()** (p. 352).

**Parameters:**

*nPrecision* the new precision.

Referenced by OGRFieldDefn(), and Set().

**16.14.3.12 void OGRFieldDefn::SetType (OGRFieldType *eType*)** [inline]

Set the type of this field. This should never be done to an **OGRFieldDefn** (p. 119) that is already part of an **OGRFeatureDefn** (p. 113).

This method is the same as the C function **OGR\_Fld\_SetType()** (p. 352).

---

**Parameters:**

*eType* the new field type.

Referenced by Set().

**16.14.3.13 void OGRFieldDefn::SetWidth (int *nWidth*) [inline]**

Set the formatting width for this field in characters.

This method is the same as the C function **OGR\_Fld\_SetWidth()** (p. 352).

**Parameters:**

*nWidth* the new width.

Referenced by OGRFieldDefn(), and Set().

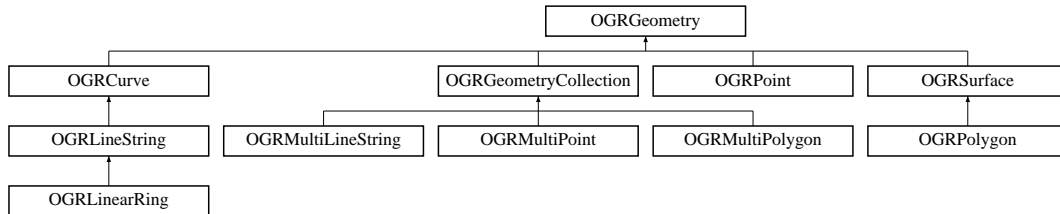
The documentation for this class was generated from the following files:

- **ogr\_feature.h**
- ogrfielddefn.cpp

## 16.15 OGRGeometry Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRGeometry::



### Public Member Functions

- virtual int **getDimension** () const =0
- virtual int **getCoordinateDimension** () const
- virtual OGRBoolean **IsEmpty** () const
- virtual OGRBoolean **IsValid** () const
- virtual OGRBoolean **IsSimple** () const
- virtual OGRBoolean **IsRing** () const
- virtual void **empty** ()=0
- virtual **OGRGeometry** \* **clone** () const =0
- virtual void **getEnvelope** (**OGREnvelope** \*psEnvelope) const =0
- virtual int **WkbSize** () const =0
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)=0
- virtual OGRErr **exportToWkb** (**OGRwkbByteOrder**, unsigned char \*) const =0
- virtual OGRErr **importFromWkt** (char \*\*ppszInput)=0
- virtual OGRErr **exportToWkt** (char \*\*ppszDstText) const =0
- virtual **OGRwkbGeometryType** **getGeometryType** () const =0
- virtual const char \* **getGeometryName** () const =0
- virtual void **dumpReadable** (FILE \*, const char \*=NULL) const
- virtual void **flattenTo2D** ()=0
- virtual char \* **exportToGML** () const
- virtual char \* **exportToKML** () const
- virtual char \* **exportToJson** () const
- virtual void **closeRings** ()
- virtual void **setCoordinateDimension** (int nDimension)
- void **assignSpatialReference** (**OGRSpatialReference** \*poSR)
- **OGRSpatialReference** \* **getSpatialReference** (void) const
- virtual OGRErr **transform** (**OGRCoordinateTransformation** \*poCT)=0
- OGRErr **transformTo** (**OGRSpatialReference** \*poSR)
- virtual OGRBoolean **Intersects** (**OGRGeometry** \*) const
- virtual OGRBoolean **Equals** (**OGRGeometry** \*) const =0
- virtual OGRBoolean **Disjoint** (const **OGRGeometry** \*) const
- virtual OGRBoolean **Touches** (const **OGRGeometry** \*) const
- virtual OGRBoolean **Crosses** (const **OGRGeometry** \*) const
- virtual OGRBoolean **Within** (const **OGRGeometry** \*) const
- virtual OGRBoolean **Contains** (const **OGRGeometry** \*) const

- virtual OGRBoolean **Overlaps** (const OGRGeometry \*) const
- virtual OGRGeometry \* **getBoundary** () const
- virtual double **Distance** (const OGRGeometry \*) const
- virtual OGRGeometry \* **ConvexHull** () const
- virtual OGRGeometry \* **Buffer** (double dfDist, int nQuadSegs=30) const
- virtual OGRGeometry \* **Intersection** (const OGRGeometry \*) const
- virtual OGRGeometry \* **Union** (const OGRGeometry \*) const
- virtual OGRGeometry \* **Difference** (const OGRGeometry \*) const
- virtual OGRGeometry \* **SymmetricDifference** (const OGRGeometry \*) const

### 16.15.1 Detailed Description

Abstract base class for all geometry classes.

Note that the family of spatial analysis methods (**Equal()**, **Disjoint()** (p. 128), ..., **ConvexHull()** (p. 127), **Buffer()** (p. 125), ...) are not implemented at this time. Some other required and optional geometry methods have also been omitted at this time.

### 16.15.2 Member Function Documentation

#### 16.15.2.1 void OGRGeometry::assignSpatialReference (OGRSpatialReference \* poSR)

Assign spatial reference to this object. Any existing spatial reference is replaced, but under no circumstances does this result in the object being reprojected. It is just changing the interpretation of the existing geometry. Note that assigning a spatial reference increments the reference count on the **OGRSpatialReference** (p. 217), but does not copy it.

This is similar to the SFCOM IGeometry::put\_SpatialReference() method.

This method is the same as the C function **OGR\_G\_AssignSpatialReference()** (p. 354).

#### Parameters:

*poSR* new spatial reference system to apply.

References OGRSpatialReference::Reference(), and OGRSpatialReference::Release().

Referenced by OGRPolygon::clone(), OGRPoint::clone(), OGRMultiPolygon::clone(), OGRMultiPoint::clone(), OGRMultiLineString::clone(), OGRLineString::clone(), OGRLinearRing::clone(), OGRGeometryCollection::clone(), OGRGeometryFactory::createFromWkb(), OGRGeometryFactory::createFromWkt(), OGRPolygon::transform(), OGRPoint::transform(), OGRLineString::transform(), and OGRGeometryCollection::transform().

#### 16.15.2.2 OGRGeometry \* OGRGeometry::Buffer (double dfDist, int nQuadSegs = 30) const [virtual]

Compute buffer of geometry.

Builds a new geometry containing the buffer region around the geometry on which it is invoked. The buffer is a polygon containing the region within the buffer distance of the original geometry.

Some buffer sections are properly described as curves, but are converted to approximate polygons. The nQuadSegs parameter can be used to control how many segments should be used to define a 90 degree

curve - a quadrant of a circle. A value of 30 is a reasonable default. Large values result in large numbers of vertices in the resulting buffer geometry while small numbers reduce the accuracy of the result.

This method is the same as the C function `OGR_G_Buffer()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

**Parameters:**

*dfDist* the buffer distance to be applied.

*nQuadSegs* the number of segments used to approximate a 90 degree (quadrant) of curvature.

**Returns:**

the newly created geometry, or NULL if an error occurs.

### 16.15.2.3 `OGRGeometry * OGRGeometry::clone () const` [pure virtual]

Make a copy of this object.

This method relates to the `SFCOM IGeometry::clone()` method.

This method is the same as the C function `OGR_G_Clone()` (p. 354).

**Returns:**

a new object instance with the same geometry, and spatial reference system as the original.

Implemented in **OGRPoint** (p. 194), **OGRLineString** (p. 173), **OGRLinearRing** (p. 168), **OGRPolygon** (p. 203), **OGRGeometryCollection** (p. 143), **OGRMultiPolygon** (p. 190), **OGRMultiPoint** (p. 187), and **OGRMultiLineString** (p. 184).

Referenced by `OGRGeometryCollection::addGeometry()`, and `OGRFeature::SetGeometry()`.

### 16.15.2.4 `void OGRGeometry::closeRings ()` [virtual]

Force rings to be closed.

If this geometry, or any contained geometries has polygon rings that are not closed, they will be closed by adding the starting point at the end.

Reimplemented in **OGRLinearRing** (p. 168), **OGRPolygon** (p. 203), and **OGRGeometryCollection** (p. 143).

### 16.15.2.5 `OGRBoolean OGRGeometry::Contains (const OGRGeometry * poOtherGeom) const` [virtual]

Test for containment.

Tests if actual geometry object contains the passed geometry.

This method is the same as the C function `OGR_G_Contains()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

---

**Parameters:**

*poOtherGeom* the geometry to compare to this geometry.

**Returns:**

TRUE if poOtherGeom contains this geometry, otherwise FALSE.

References exportToGEOS().

**16.15.2.6 OGRGeometry \* OGRGeometry::ConvexHull () const** [virtual]

Compute convex hull.

A new geometry object is created and returned containing the convex hull of the geometry on which the method is invoked.

This method is the same as the C function OGR\_G\_ConvexHull().

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Returns:**

a newly allocated geometry now owned by the caller, or NULL on failure.

**16.15.2.7 OGRBoolean OGRGeometry::Crosses (const OGRGeometry \* poOtherGeom) const** [virtual]

Test for crossing.

Tests if this geometry and the other passed into the method are crossing.

This method is the same as the C function OGR\_G\_Crosses().

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Parameters:**

*poOtherGeom* the geometry to compare to this geometry.

**Returns:**

TRUE if they are crossing, otherwise FALSE.

References exportToGEOS().

**16.15.2.8 OGRGeometry \* OGRGeometry::Difference (const OGRGeometry \* poOtherGeom) const** [virtual]

Compute difference.

Generates a new geometry which is the region of this geometry with the region of the second geometry removed.

This method is the same as the C function OGR\_G\_Difference().

---

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Parameters:**

*poOtherGeom* the other geometry removed from "this" geometry.

**Returns:**

a new geometry representing the difference or NULL if the difference is empty or an error occurs.

References exportToGEOS().

**16.15.2.9 OGRBoolean OGRGeometry::Disjoint (const OGRGeometry \* *poOtherGeom*) const**  
[virtual]

Test for disjointness.

Tests if this geometry and the other passed into the method are disjoint.

This method is the same as the C function OGR\_G\_Disjoint().

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Parameters:**

*poOtherGeom* the geometry to compare to this geometry.

**Returns:**

TRUE if they are disjoint, otherwise FALSE.

References exportToGEOS().

**16.15.2.10 double OGRGeometry::Distance (const OGRGeometry \* *poOtherGeom*) const**  
[virtual]

Compute distance between two geometries.

Returns the shortest distance between the two geometries.

This method is the same as the C function OGR\_G\_Distance().

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Parameters:**

*poOtherGeom* the other geometry to compare against.

**Returns:**

the distance between the geometries or -1 if an error occurs.

References exportToGEOS().

---

**16.15.2.11 void OGRGeometry::dumpReadable (FILE \**fp*, const char \**pszPrefix* = NULL) const** [virtual]

Dump geometry in well known text format to indicated output file.

This method is the same as the C function **OGR\_G\_DumpReadable()** (p. 356).

**Parameters:**

*fp* the text file to write the geometry to.

*pszPrefix* the prefix to put on each line of output.

References **exportToWkt()**.

Referenced by **OGRFeature::DumpReadable()**.

**16.15.2.12 void OGRGeometry::empty ()** [pure virtual]

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This method relates to the SFCOM **IGeometry::Empty()** method.

This method is the same as the C function **OGR\_G\_Empty()** (p. 357).

Implemented in **OGRPoint** (p. 194), **OGRLineString** (p. 173), **OGRPolygon** (p. 203), and **OGRGeometryCollection** (p. 143).

**16.15.2.13 int OGRGeometry::Equals (OGRGeometry \**poOtherGeom*) const** [pure virtual]

Returns true if two geometries are equivalent.

This method is the same as the C function **OGR\_G\_Equal()**.

**Returns:**

TRUE if equivalent or FALSE otherwise.

Implemented in **OGRPoint** (p. 194), **OGRLineString** (p. 174), **OGRPolygon** (p. 203), and **OGRGeometryCollection** (p. 143).

Referenced by **OGRFeature::Equal()**, and **OGRGeometryCollection::Equals()**.

**16.15.2.14 char \* OGRGeometry::exportToGML () const** [virtual]

Convert a geometry into GML format.

The GML geometry is expressed directly in terms of GML basic data types assuming the this is available in the gml namespace. The returned string should be freed with **CPLFree()** when no longer required.

This method is the same as the C function **OGR\_G\_ExportToGML()**.

**Returns:**

A GML fragment or NULL in case of error.

---

**16.15.2.15** `char * OGRGeometry::exportToJson () const` [virtual]

Convert a geometry into GeoJSON format.

The returned string should be freed with `CPLFree()` when no longer required.

This method is the same as the C function `OGR_G_ExportToJson()`.

**Returns:**

A GeoJSON fragment or NULL in case of error.

**16.15.2.16** `char * OGRGeometry::exportToKML () const` [virtual]

Convert a geometry into KML format.

The returned string should be freed with `CPLFree()` when no longer required.

This method is the same as the C function `OGR_G_ExportToKML()`.

**Returns:**

A KML fragment or NULL in case of error.

**16.15.2.17** `OGRERR OGRGeometry::exportToWkb (OGRwkbByteOrder eByteOrder, unsigned char * pabyData) const` [pure virtual]

Convert a geometry into well known binary format.

This method relates to the `SFCOM IWks::ExportToWKB()` method.

This method is the same as the C function `OGR_G_ExportToWkb()` (p. 357).

**Parameters:**

*eByteOrder* One of `wkbXDR` or `wkbNDR` indicating MSB or LSB byte order respectively.

*pabyData* a buffer into which the binary representation is written. This buffer must be at least `OGRGeometry::WkbSize()` (p. 140) byte in size.

**Returns:**

Currently `OGRERR_NONE` is always returned.

Implemented in `OGRPoint` (p. 194), `OGRLineString` (p. 174), `OGRLinearRing` (p. 168), `OGRPolygon` (p. 204), and `OGRGeometryCollection` (p. 144).

Referenced by `OGRGeometryCollection::exportToWkb()`.

**16.15.2.18** `OGRERR OGRGeometry::exportToWkt (char ** ppszDstText) const` [pure virtual]

Convert a geometry into well known text format.

This method relates to the `SFCOM IWks::ExportToWKT()` method.

This method is the same as the C function `OGR_G_ExportToWkt()` (p. 358).

**Parameters:**

*ppszDstText* a text buffer is allocated by the program, and assigned to the passed pointer.

**Returns:**

Currently OGRERR\_NONE is always returned.

Implemented in **OGRPoint** (p. 195), **OGRLineString** (p. 174), **OGRPolygon** (p. 204), **OGRGeometryCollection** (p. 144), **OGRMultiPolygon** (p. 190), **OGRMultiPoint** (p. 187), and **OGRMultiLineString** (p. 184).

Referenced by `dumpReadable()`, `OGRMultiPolygon::exportToWkt()`, `OGRMultiLineString::exportToWkt()`, `OGRGeometryCollection::exportToWkt()`, and `OGRFeature::GetFieldAsString()`.

**16.15.2.19 void OGRGeometry::flattenTo2D () [pure virtual]**

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This method is the same as the C function **OGR\_G\_FlattenTo2D()** (p. 358).

Implemented in **OGRPoint** (p. 195), **OGRLineString** (p. 175), **OGRPolygon** (p. 204), and **OGRGeometryCollection** (p. 145).

**16.15.2.20 OGRGeometry \* OGRGeometry::getBoundary () const [virtual]**

Compute boundary.

A new geometry object is created and returned containing the boundary of the geometry on which the method is invoked.

This method is the same as the C function `OGR_G_GetBoundary()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

**Returns:**

a newly allocated geometry now owned by the caller, or NULL on failure.

**16.15.2.21 int OGRGeometry::getCoordinateDimension () const [virtual]**

Get the dimension of the coordinates in this object.

This method corresponds to the `SFCOM IGeometry::GetDimension()` method.

This method is the same as the C function **OGR\_G\_GetCoordinateDimension()** (p. 359).

**Returns:**

in practice this always returns 2 indicating that coordinates are specified within a two dimensional space.

Referenced by `OGRGeometryCollection::addGeometryDirectly()`, `OGRPolygon::addRing()`, `OGRPolygon::addRingDirectly()`, `OGRLineString::clone()`, `OGRLinearRing::closeRings()`, `OGRPolygon::exportToWkb()`, `OGRLineString::exportToWkb()`, `OGRPolygon::exportToWkt()`, `OGRMultiPoint::exportToWkt()`, `OGRLineString::exportToWkt()`, `OGRPolygon::getGeometryType()`,

OGRMultiPolygon::getGeometryType(), OGRMultiPoint::getGeometryType(), OGRMultiLineString::getGeometryType(), OGRLineString::getGeometryType(), OGRGeometryCollection::getGeometryType(), OGRLineString::getPoint(), OGRGeometryCollection::importFromWkb(), OGRLineString::setNumPoints(), OGRLineString::setPoint(), OGRLineString::setPoints(), OGRLineString::Value(), OGRPolygon::WkbSize(), and OGRLineString::WkbSize().

#### 16.15.2.22 int OGRGeometry::getDimension () const [pure virtual]

Get the dimension of this object.

This method corresponds to the SFCOM IGeometry::GetDimension() method. It indicates the dimension of the object, but does not indicate the dimension of the underlying space (as indicated by **OGRGeometry::getCoordinateDimension()** (p. 131)).

This method is the same as the C function **OGR\_G\_GetDimension()** (p. 359).

##### Returns:

0 for points, 1 for lines and 2 for surfaces.

Implemented in **OGRPoint** (p. 195), **OGRLineString** (p. 175), **OGRPolygon** (p. 205), and **OGRGeometryCollection** (p. 145).

#### 16.15.2.23 void OGRGeometry::getEnvelope (OGREnvelope \* *psEnvelope*) const [pure virtual]

Computes and returns the bounding envelope for this geometry in the passed *psEnvelope* structure.

This method is the same as the C function **OGR\_G\_GetEnvelope()** (p. 359).

##### Parameters:

*psEnvelope* the structure in which to place the results.

Implemented in **OGRPoint** (p. 196), **OGRLineString** (p. 175), **OGRPolygon** (p. 205), and **OGRGeometryCollection** (p. 145).

Referenced by OGRGeometryCollection::getEnvelope(), OGRLayer::GetExtent(), Intersects(), and OGRGeometryFactory::organizePolygons().

#### 16.15.2.24 const char \* OGRGeometry::getGeometryName () const [pure virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_GetGeometryName()** (p. 360).

##### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Implemented in **OGRPoint** (p. 196), **OGRLineString** (p. 176), **OGRLinearRing** (p. 169), **OGRPolygon** (p. 206), **OGRGeometryCollection** (p. 146), **OGRMultiPolygon** (p. 191), **OGRMultiPoint** (p. 187), and **OGRMultiLineString** (p. 184).

Referenced by OGRFeature::GetFieldAsString().

### 16.15.2.25 OGRwkbGeometryType OGRGeometry::getGeometryType () const [pure virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function `OGR_G_GetGeometryType()` (p. 361).

#### Returns:

the geometry type code.

Implemented in **OGRPoint** (p. 196), **OGRLineString** (p. 176), **OGRPolygon** (p. 206), **OGRGeometryCollection** (p. 146), **OGRMultiPolygon** (p. 191), **OGRMultiPoint** (p. 188), and **OGRMultiLineString** (p. 185).

Referenced by `OGRMultiPolygon::addGeometryDirectly()`, `OGRMultiPoint::addGeometryDirectly()`, `OGRMultiLineString::addGeometryDirectly()`, `OGRPolygon::Equals()`, `OGRPoint::Equals()`, `OGRLineString::Equals()`, `OGRGeometryCollection::Equals()`, `OGRGeometryFactory::forceToMultiLineString()`, `OGRGeometryFactory::forceToMultiPoint()`, `OGRGeometryFactory::forceToMultiPolygon()`, `OGRGeometryFactory::forceToPolygon()`, and `OGRGeometryCollection::get_Area()`.

### 16.15.2.26 OGRSpatialReference \* OGRGeometry::getSpatialReference (void) const [inline]

Returns spatial reference system for object.

This method relates to the `SFCOM IGeometry::get_SpatialReference()` method.

This method is the same as the C function `OGR_G_GetSpatialReference()` (p. 362).

#### Returns:

a reference to the spatial reference object. The object may be shared with many geometry objects, and should not be modified.

Referenced by `OGRPolygon::clone()`, `OGRPoint::clone()`, `OGRMultiPolygon::clone()`, `OGRMultiPoint::clone()`, `OGRMultiLineString::clone()`, `OGRLineString::clone()`, `OGRLinearRing::clone()`, `OGRGeometryCollection::clone()`, and `transformTo()`.

### 16.15.2.27 OGRErr OGRGeometry::importFromWkb (unsigned char \* *pabyData*, int *nSize* = -1) [pure virtual]

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the `SFCOM IWks::ImportFromWKB()` method.

This method is the same as the C function `OGR_G_ImportFromWkb()` (p. 363).

#### Parameters:

*pabyData* the binary input data.

*nSize* the size of pabyData in bytes, or zero if not known.

#### Returns:

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implemented in **OGRPoint** (p. 197), **OGRLineString** (p. 178), **OGRLinearRing** (p. 169), **OGRPolygon** (p. 207), and **OGRGeometryCollection** (p. 147).

Referenced by OGRGeometryFactory::createFromWkb().

#### 16.15.2.28 OGRErr OGRGeometry::importFromWkt (char \*\**ppszInput*) [pure virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKT() method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

#### Parameters:

*ppszInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

#### Returns:

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implemented in **OGRPoint** (p. 198), **OGRLineString** (p. 179), **OGRPolygon** (p. 207), **OGRGeometryCollection** (p. 148), **OGRMultiPolygon** (p. 191), **OGRMultiPoint** (p. 188), and **OGRMultiLineString** (p. 185).

Referenced by OGRGeometryFactory::createFromWkt().

#### 16.15.2.29 OGRGeometry \* OGRGeometry::Intersection (const OGRGeometry \**poOtherGeom*) const [virtual]

Compute intersection.

Generates a new geometry which is the region of intersection of the two geometries operated on. The Intersect() method can be used to test if two geometries intersect.

This method is the same as the C function OGR\_G\_Intersection().

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

#### Parameters:

*poOtherGeom* the other geometry intersected with "this" geometry.

**Returns:**

a new geometry representing the intersection or NULL if there is no intersection or an error occurs.

References `exportToGEOS()`.

### 16.15.2.30 **OGRBoolean OGRGeometry::Intersects (OGRGeometry \* *poOtherGeom*) const** [virtual]

Do these features intersect?

Determines whether two geometries intersect. If GEOS is enabled, then this is done in rigorous fashion otherwise TRUE is returned if the envelopes (bounding boxes) of the two features overlap.

The *poOtherGeom* argument may be safely NULL, but in this case the method will always return TRUE. That is, a NULL geometry is treated as being everywhere.

This method is the same as the C function **OGR\_G\_Intersects()** (p. 364).

**Parameters:**

*poOtherGeom* the other geometry to test against.

**Returns:**

TRUE if the geometries intersect, otherwise FALSE.

References `exportToGEOS()`, `getEnvelope()`, `OGREnvelope::MaxX`, `OGREnvelope::MaxY`, `OGREnvelope::MinX`, and `OGREnvelope::MinY`.

### 16.15.2.31 **OGRBoolean OGRGeometry::IsEmpty () const** [virtual]

Returns TRUE (non-zero) if the object has no points. Normally this returns FALSE except between when an object is instantiated and points have been assigned.

This method relates to the SFCOM `IGeometry::IsEmpty()` method.

NOTE: This method is hardcoded to return FALSE at this time.

**Returns:**

TRUE if object is empty, otherwise FALSE.

Test if the geometry is empty

This method is the same as the C function `OGR_G_IsEmpty()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always return FALSE.

**Returns:**

TRUE if the geometry has no points, otherwise FALSE.

**16.15.2.32 OGRBoolean OGRGeometry::IsRing () const** [virtual]

Test if the geometry is a ring

This method is the same as the C function `OGR_G_IsRing()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always return FALSE.

**Returns:**

TRUE if the geometry has no points, otherwise FALSE.

**16.15.2.33 OGRBoolean OGRGeometry::IsSimple () const** [virtual]

Returns TRUE if the geometry is simple.

Returns TRUE if the geometry has no anomalous geometric points, such as self intersection or self tangency. The description of each instantiable geometric class will include the specific conditions that cause an instance of that class to be classified as not simple.

This method relates to the SFCOM IGeometry::IsSimple() method.

NOTE: This method is hardcoded to return TRUE at this time.

**Returns:**

TRUE if object is simple, otherwise FALSE.

Test if the geometry is simple

This method is the same as the C function `OGR_G_IsSimple()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always return FALSE.

**Returns:**

TRUE if the geometry has no points, otherwise FALSE.

**16.15.2.34 OGRBoolean OGRGeometry::IsValid () const** [virtual]

Test if the geometry is valid

This method is the same as the C function `OGR_G_IsValid()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always return FALSE.

**Returns:**

TRUE if the geometry has no points, otherwise FALSE.

---

### 16.15.2.35 OGRBoolean OGRGeometry::Overlaps (const OGRGeometry \* *poOtherGeom*) const [virtual]

Test for overlap.

Tests if this geometry and the other passed into the method overlap, that is their intersection has a non-zero area.

This method is the same as the C function `OGR_G_Overlaps()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

#### Parameters:

*poOtherGeom* the geometry to compare to this geometry.

#### Returns:

TRUE if they are overlapping, otherwise FALSE.

References `exportToGEOS()`.

### 16.15.2.36 void OGRGeometry::setCoordinateDimension (int *nNewDimension*) [virtual]

Set the coordinate dimension.

This method sets the explicit coordinate dimension. Setting the coordinate dimension of a geometry to 2 should zero out any existing Z values. Setting the dimension of a geometry collection will not necessarily affect the children geometries.

#### Parameters:

*nNewDimension* New coordinate dimension value, either 2 or 3.

Reimplemented in **OGRPoint** (p. 198), **OGRLineString** (p. 179), **OGRPolygon** (p. 208), and **OGRGeometryCollection** (p. 149).

Referenced by `OGRGeometryCollection::setCoordinateDimension()`.

### 16.15.2.37 OGRGeometry \* OGRGeometry::SymmetricDifference (const OGRGeometry \* *poOtherGeom*) const [virtual]

Compute symmetric difference.

Generates a new geometry which is the symmetric difference of this geometry and the second geometry passed into the method.

This method is the same as the C function `OGR_G_SymmetricDifference()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

#### Parameters:

*poOtherGeom* the other geometry.

**Returns:**

a new geometry representing the symmetric difference or NULL if the difference is empty or an error occurs.

References `exportToGEOS()`.

### 16.15.2.38 **OGRBoolean OGRGeometry::Touches (const OGRGeometry \* *poOtherGeom*) const** [virtual]

Test for touching.

Tests if this geometry and the other passed into the method are touching.

This method is the same as the C function `OGR_G_Touches()`.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a `CPLE_NotSupported` error.

**Parameters:**

*poOtherGeom* the geometry to compare to this geometry.

**Returns:**

TRUE if they are touching, otherwise FALSE.

References `exportToGEOS()`.

### 16.15.2.39 **OGRERR OGRGeometry::transform (OGRCoordinateTransformation \* *poCT*)** [pure virtual]

Apply arbitrary coordinate transformation to geometry.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this method does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This method is the same as the C function `OGR_G_Transform()` (p. 365).

**Parameters:**

*poCT* the transformation to apply.

**Returns:**

`OGRERR_NONE` on success or an error code.

Implemented in **OGRPoint** (p. 199), **OGRLineString** (p. 181), **OGRPolygon** (p. 208), and **OGRGeometryCollection** (p. 149).

Referenced by `OGRGeometryCollection::transform()`, and `transformTo()`.

**16.15.2.40 OGRErr OGRGeometry::transformTo (OGRSpatialReference \* *poSR*)**

Transform geometry to new spatial reference system.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

This method will only work if the geometry already has an assigned spatial reference system, and if it is transformable to the target coordinate system.

Because this method requires internal creation and initialization of an **OGRCoordinateTransformation** (p. 86) object it is significantly more expensive to use this method to transform many geometries than it is to create the **OGRCoordinateTransformation** (p. 86) in advance, and call **transform()** (p. 138) with that transformation. This method exists primarily for convenience when only transforming a single geometry.

This method is the same as the C function **OGR\_G\_TransformTo()** (p. 366).

**Parameters:**

*poSR* spatial reference system to transform to.

**Returns:**

OGRERR\_NONE on success, or an error code.

References **getSpatialReference()**, **OGRCreateCoordinateTransformation()**, and **transform()**.

**16.15.2.41 OGRGeometry \* OGRGeometry::Union (const OGRGeometry \* *poOtherGeom*) const**  
[virtual]

Compute union.

Generates a new geometry which is the region of union of the two geometries operated on.

This method is the same as the C function **OGR\_G\_Union()**.

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a **CPLE\_NotSupported** error.

**Parameters:**

*poOtherGeom* the other geometry unioned with "this" geometry.

**Returns:**

a new geometry representing the union or NULL if an error occurs.

References **exportToGEOS()**.

**16.15.2.42 OGRBoolean OGRGeometry::Within (const OGRGeometry \* *poOtherGeom*) const**  
[virtual]

Test for containment.

Tests if actual geometry object is within the passed geometry.

This method is the same as the C function **OGR\_G\_Within()**.

---

This method is built on the GEOS library, check it for the definition of the geometry operation. If OGR is built without the GEOS library, this method will always fail, issuing a CPLE\_NotSupported error.

**Parameters:**

*poOtherGeom* the geometry to compare to this geometry.

**Returns:**

TRUE if poOtherGeom is within this geometry, otherwise FALSE.

References exportToGEOS().

#### 16.15.2.43 int OGRGeometry::WkbSize() const [pure virtual]

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the SFCOM IWks::WkbSize() method.

This method is the same as the C function **OGR\_G\_WkbSize()** (p. 366).

**Returns:**

size of binary representation in bytes.

Implemented in **OGRPoint** (p. 199), **OGRLineString** (p. 182), **OGRLinearRing** (p. 170), **OGRPolygon** (p. 209), and **OGRGeometryCollection** (p. 149).

Referenced by OGRGeometryCollection::exportToWkb(), OGRGeometryCollection::importFromWkb(), and OGRGeometryCollection::WkbSize().

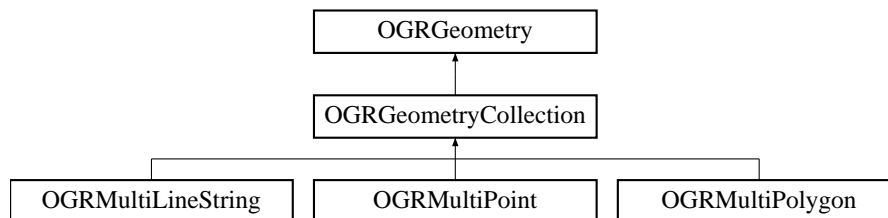
The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- ogrgeometry.cpp

## 16.16 OGRGeometryCollection Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRGeometryCollection::



### Public Member Functions

- **OGRGeometryCollection ()**
- virtual const char \* **getGeometryName ()** const
- virtual **OGRwkbGeometryType** **getGeometryType ()** const
- virtual **OGRGeometry** \* **clone ()** const
- virtual void **empty ()**
- virtual OGRErr **transform (OGRCoordinateTransformation \*poCT)**
- virtual void **flattenTo2D ()**
- virtual int **WkbSize ()** const
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)
- virtual OGRErr **exportToWkb** (OGRwkbByteOrder, unsigned char \*) const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*ppszDstText) const
- virtual double **get\_Area ()** const
- virtual int **getDimension ()** const
- virtual void **getEnvelope (OGREnvelope \*psEnvelope)** const
- int **getNumGeometries ()** const
- **OGRGeometry** \* **getGeometryRef** (int)
- virtual OGRBoolean **Equals (OGRGeometry \*)** const
- virtual void **setCoordinateDimension** (int nDimension)
- virtual OGRErr **addGeometry** (const **OGRGeometry** \*)
- virtual OGRErr **addGeometryDirectly (OGRGeometry \*)**
- virtual OGRErr **removeGeometry** (int iIndex, int bDelete=TRUE)
- void **closeRings ()**

### 16.16.1 Detailed Description

A collection of 1 or more geometry objects.

All geometries must share a common spatial reference system, and Subclasses may impose additional restrictions on the contents.

## 16.16.2 Constructor & Destructor Documentation

### 16.16.2.1 OGRGeometryCollection::OGRGeometryCollection ()

Create an empty geometry collection.

## 16.16.3 Member Function Documentation

### 16.16.3.1 OGRErr OGRGeometryCollection::addGeometry (const OGRGeometry \* *poNewGeom*) [virtual]

Add a geometry to the container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. The passed geometry is cloned to make an internal copy.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_AddGeometry()** (p. 352).

#### Parameters:

*poNewGeom* geometry to add to the container.

#### Returns:

OGRErr\_NONE if successful, or OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

References **addGeometryDirectly()**, and **OGRGeometry::clone()**.

Referenced by **OGRMultiPolygon::clone()**, **OGRMultiPoint::clone()**, **OGRMultiLineString::clone()**, and **clone()**.

### 16.16.3.2 OGRErr OGRGeometryCollection::addGeometryDirectly (OGRGeometry \* *poNewGeom*) [virtual]

Add a geometry directly to the container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. Ownership of the passed geometry is taken by the container rather than cloning as **addGeometry()** (p. 142) does.

This method is the same as the C function **OGR\_G\_AddGeometryDirectly()** (p. 353).

There is no SFCOM analog to this method.

#### Parameters:

*poNewGeom* geometry to add to the container.

#### Returns:

OGRErr\_NONE if successful, or OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

---

Reimplemented in **OGRMultiPolygon** (p. 189), **OGRMultiPoint** (p. 186), and **OGRMultiLineString** (p. 183).

References `OGRGeometry::getCoordinateDimension()`.

Referenced by `addGeometry()`, and `importFromWkt()`.

### 16.16.3.3 **OGRGeometry \* OGRGeometryCollection::clone () const** [virtual]

Make a copy of this object.

This method relates to the SFCOM `IGeometry::clone()` method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

#### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Implements **OGRGeometry** (p. 126).

Reimplemented in **OGRMultiPolygon** (p. 190), **OGRMultiPoint** (p. 187), and **OGRMultiLineString** (p. 184).

References `addGeometry()`, `OGRGeometry::assignSpatialReference()`, and `OGRGeometry::getSpatialReference()`.

### 16.16.3.4 **void OGRGeometryCollection::closeRings ()** [virtual]

Force rings to be closed.

If this geometry, or any contained geometries has polygon rings that are not closed, they will be closed by adding the starting point at the end.

Reimplemented from **OGRGeometry** (p. 126).

References `getGeometryType()`, and `wkbPolygon`.

### 16.16.3.5 **void OGRGeometryCollection::empty ()** [virtual]

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This method relates to the SFCOM `IGeometry::Empty()` method.

This method is the same as the C function **OGR\_G\_Empty()** (p. 357).

Implements **OGRGeometry** (p. 129).

Referenced by `importFromWkb()`, `OGRMultiPolygon::importFromWkt()`, `OGRMultiPoint::importFromWkt()`, `OGRMultiLineString::importFromWkt()`, and `importFromWkt()`.

### 16.16.3.6 **OGRBoolean OGRGeometryCollection::Equals (OGRGeometry \* *poOtherGeom*) const** [virtual]

Returns two if two geometries are equivalent.

This method is the same as the C function `OGR_G_Equal()`.

---

**Returns:**

TRUE if equivalent or FALSE otherwise.

Implements **OGRGeometry** (p. 129).

References **OGRGeometry::Equals()**, **getGeometryRef()**, **getGeometryType()**, **OGRGeometry::getGeometryType()**, and **getNumGeometries()**.

### 16.16.3.7 **OGRERR OGRGeometryCollection::exportToWkb (OGRwkbByteOrder *eByteOrder*, unsigned char \* *pabyData*) const** [virtual]

Convert a geometry into well known binary format.

This method relates to the SFCOM IWks::ExportToWKB() method.

This method is the same as the C function **OGR\_G\_ExportToWkb()** (p. 357).

**Parameters:**

***eByteOrder*** One of wkbXDR or wkbNDR indicating MSB or LSB byte order respectively.

***pabyData*** a buffer into which the binary representation is written. This buffer must be at least **OGRGeometry::WkbSize()** (p. 140) byte in size.

**Returns:**

Currently OGRERR\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

References **OGRGeometry::exportToWkb()**, **getGeometryType()**, and **OGRGeometry::WkbSize()**.

### 16.16.3.8 **OGRERR OGRGeometryCollection::exportToWkt (char \*\* *ppszDstText*) const** [virtual]

Convert a geometry into well known text format.

This method relates to the SFCOM IWks::ExportToWKT() method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

**Parameters:**

***ppszDstText*** a text buffer is allocated by the program, and assigned to the passed pointer.

**Returns:**

Currently OGRERR\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

Reimplemented in **OGRMultiPolygon** (p. 190), **OGRMultiPoint** (p. 187), and **OGRMultiLineString** (p. 184).

References **OGRGeometry::exportToWkt()**, **getGeometryName()**, and **getNumGeometries()**.

---

**16.16.3.9 void OGRGeometryCollection::flattenTo2D () [virtual]**

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This method is the same as the C function **OGR\_G\_FlattenTo2D()** (p. 358).

Implements **OGRGeometry** (p. 131).

**16.16.3.10 double OGRGeometryCollection::get\_Area () const [virtual]**

Compute area of geometry collection.

The area is computed as the sum of the areas of all members in this collection.

**Note:**

No warning will be issued if a member of the collection does not support the `get_Area` method.

**Returns:**

computed area.

Reimplemented in **OGRMultiPolygon** (p. 190).

References `getGeometryName()`, `OGRGeometry::getGeometryType()`, `wkbGeometryCollection`, `wkbLinearRing`, `wkbLineString`, `wkbMultiPolygon`, and `wkbPolygon`.

**16.16.3.11 int OGRGeometryCollection::getDimension () const [virtual]**

Get the dimension of this object.

This method corresponds to the SFCOM `IGeometry::GetDimension()` method. It indicates the dimension of the object, but does not indicate the dimension of the underlying space (as indicated by **OGRGeometry::getCoordinateDimension()** (p. 131)).

This method is the same as the C function **OGR\_G\_GetDimension()** (p. 359).

**Returns:**

0 for points, 1 for lines and 2 for surfaces.

Implements **OGRGeometry** (p. 132).

**16.16.3.12 void OGRGeometryCollection::getEnvelope (OGREnvelope \* *psEnvelope*) const [virtual]**

Computes and returns the bounding envelope for this geometry in the passed `psEnvelope` structure.

This method is the same as the C function **OGR\_G\_GetEnvelope()** (p. 359).

**Parameters:**

*psEnvelope* the structure in which to place the results.

Implements **OGRGeometry** (p. 132).

References `OGRGeometry::getEnvelope()`, `OGREnvelope::MaxX`, `OGREnvelope::MaxY`, `OGREnvelope::MinX`, and `OGREnvelope::MinY`.

### 16.16.3.13 `const char * OGRGeometryCollection::getGeometryName () const` [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function `OGR_G_GetGeometryName()` (p. 360).

#### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Implements `OGRGeometry` (p. 132).

Reimplemented in `OGRMultiPolygon` (p. 191), `OGRMultiPoint` (p. 187), and `OGRMultiLineString` (p. 184).

Referenced by `exportToWkt()`, `get_Area()`, and `importFromWkt()`.

### 16.16.3.14 `OGRGeometry * OGRGeometryCollection::getGeometryRef (int i)`

Fetch geometry from container.

This method returns a pointer to an geometry within the container. The returned geometry remains owned by the container, and should not be modified. The pointer is only valid until the next change to the geometry container. Use `IGeometry::clone()` to make a copy.

This method relates to the SFCOM `IGeometryCollection::get_Geometry()` method.

#### Parameters:

*i* the index of the geometry to fetch, between 0 and `getNumGeometries()` (p. 147) - 1.

#### Returns:

pointer to requested geometry.

Referenced by `OGRMultiPolygon::clone()`, `OGRMultiPoint::clone()`, `OGRMultiLineString::clone()`, `Equals()`, `OGRMultiPolygon::exportToWkt()`, `OGRMultiPoint::exportToWkt()`, `OGRMultiLineString::exportToWkt()`, `OGRGeometryFactory::forceToMultiLineString()`, `OGRGeometryFactory::forceToMultiPoint()`, `OGRGeometryFactory::forceToMultiPolygon()`, `OGRGeometryFactory::forceToPolygon()`, `OGRMultiPolygon::get_Area()`, and `OGRBuildPolygonFromEdges()`.

### 16.16.3.15 `OGRwkbGeometryType OGRGeometryCollection::getGeometryType () const` [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function `OGR_G_GetGeometryType()` (p. 361).

#### Returns:

the geometry type code.

Implements **OGRGeometry** (p. 133).

Reimplemented in **OGRMultiPolygon** (p. 191), **OGRMultiPoint** (p. 188), and **OGRMultiLineString** (p. 185).

References **OGRGeometry::getCoordinateDimension()**, **wkbGeometryCollection**, and **wkbGeometryCollection25D**.

Referenced by **closeRings()**, **Equals()**, and **exportToWkb()**.

### 16.16.3.16 int OGRGeometryCollection::getNumGeometries () const

Fetch number of geometries in container.

This method relates to the SFCOM IGeometryCollect::get\_NumGeometries() method.

#### Returns:

count of children geometries. May be zero.

Referenced by **OGRMultiPolygon::clone()**, **OGRMultiPoint::clone()**, **OGRMultiLineString::clone()**, **Equals()**, **OGRMultiPolygon::exportToWkt()**, **OGRMultiPoint::exportToWkt()**, **OGRMultiLineString::exportToWkt()**, **exportToWkt()**, **OGRGeometryFactory::forceToMultiLineString()**, **OGRGeometryFactory::forceToMultiPoint()**, **OGRGeometryFactory::forceToMultiPolygon()**, **OGRGeometryFactory::forceToPolygon()**, **OGRMultiPolygon::get\_Area()**, and **OGRBuildPolygonFromEdges()**.

### 16.16.3.17 OGRErr OGRGeometryCollection::importFromWkb (unsigned char \* *pabyData*, int *nSize* = -1) [virtual]

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKB() method.

This method is the same as the C function **OGR\_G\_ImportFromWkb()** (p. 363).

#### Parameters:

*pabyData* the binary input data.

*nSize* the size of *pabyData* in bytes, or zero if not known.

#### Returns:

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 133).

References **OGRGeometryFactory::createFromWkb()**, **empty()**, **OGRGeometry::getCoordinateDimension()**, **wkbGeometryCollection**, **wkbMultiLineString**, **wkbMultiPoint**, **wkbMultiPolygon**, and **OGRGeometry::WkbSize()**.

### 16.16.3.18 OGRErr OGRGeometryCollection::importFromWkt (char \*\* *ppszInput*) [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKT() method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

#### Parameters:

*ppszInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

#### Returns:

OGRErr\_NONE if all goes well, otherwise any of OGRErr\_NOT\_ENOUGH\_DATA, OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRErr\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 134).

Reimplemented in **OGRMultiPolygon** (p. 191), **OGRMultiPoint** (p. 188), and **OGRMultiLineString** (p. 185).

References addGeometryDirectly(), OGRGeometryFactory::createFromWkt(), empty(), and getGeometryName().

### 16.16.3.19 OGRErr OGRGeometryCollection::removeGeometry (int *iGeom*, int *bDelete* = TRUE) [virtual]

Remove a geometry from the container.

Removing a geometry will cause the geometry count to drop by one, and all "higher" geometries will shuffle down one in index.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_RemoveGeometry()** (p. 364).

#### Parameters:

*iGeom* the index of the geometry to delete. A value of -1 is a special flag meaning that all geometries should be removed.

*bDelete* if TRUE the geometry will be deallocated, otherwise it will not. The default is TRUE as the container is considered to own the geometries in it.

#### Returns:

OGRErr\_NONE if successful, or OGRErr\_FAILURE if the index is out of range.

Referenced by OGRGeometryFactory::forceToMultiLineString(), OGRGeometryFactory::forceToMultiPoint(), and OGRGeometryFactory::forceToMultiPolygon().

### 16.16.3.20 void OGRGeometryCollection::setCoordinateDimension (int *nNewDimension*) [virtual]

Set the coordinate dimension.

This method sets the explicit coordinate dimension. Setting the coordinate dimension of a geometry to 2 should zero out any existing Z values. Setting the dimension of a geometry collection will not necessarily affect the children geometries.

#### Parameters:

*nNewDimension* New coordinate dimension value, either 2 or 3.

Reimplemented from **OGRGeometry** (p. 137).

References **OGRGeometry::setCoordinateDimension()**.

### 16.16.3.21 OGRErr OGRGeometryCollection::transform (OGRCoordinateTransformation \* *poCT*) [virtual]

Apply arbitrary coordinate transformation to geometry.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this method does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This method is the same as the C function **OGR\_G\_Transform()** (p. 365).

#### Parameters:

*poCT* the transformation to apply.

#### Returns:

OGRERR\_NONE on success or an error code.

Implements **OGRGeometry** (p. 138).

References **OGRGeometry::assignSpatialReference()**, **OGRCoordinateTransformation::GetTargetCS()**, and **OGRGeometry::transform()**.

### 16.16.3.22 int OGRGeometryCollection::WkbSize () const [virtual]

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the **SFCOM IWks::WkbSize()** method.

This method is the same as the C function **OGR\_G\_WkbSize()** (p. 366).

**Returns:**

size of binary representation in bytes.

Implements **OGRGeometry** (p. 140).

References OGRGeometry::WkbSize().

The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- ogrgeometrycollection.cpp

## 16.17 OGRGeometryFactory Class Reference

```
#include <ogr_geometry.h>
```

### Static Public Member Functions

- static OGRErr **createFromWkb** (unsigned char \*, **OGRSpatialReference** \*, **OGRGeometry** \*\*, int=-1)
- static OGRErr **createFromWkt** (char \*\*, **OGRSpatialReference** \*, **OGRGeometry** \*\*)
- static **OGRGeometry** \* **createFromGML** (const char \*)
- static void **destroyGeometry** (**OGRGeometry** \*)
- static **OGRGeometry** \* **createGeometry** (**OGRwkbGeometryType**)
- static **OGRGeometry** \* **forceToPolygon** (**OGRGeometry** \*)
- static **OGRGeometry** \* **forceToMultiPolygon** (**OGRGeometry** \*)
- static **OGRGeometry** \* **forceToMultiPoint** (**OGRGeometry** \*)
- static **OGRGeometry** \* **forceToMultiLineString** (**OGRGeometry** \*)
- static **OGRGeometry** \* **organizePolygons** (**OGRGeometry** \*\*papoPolygons, int nPolygonCount, int \*pbResultValidGeometry, const char \*\*papszOptions)
- static int **haveGEOS** ()

### 16.17.1 Detailed Description

Create geometry objects from well known text/binary.

### 16.17.2 Member Function Documentation

#### 16.17.2.1 **OGRGeometry** \* **OGRGeometryFactory::createFromGML** (const char \* *pszData*) [static]

Create geometry from GML.

This method translates a fragment of GML containing only the geometry portion into a corresponding **OGRGeometry** (p. 124). There are many limitations on the forms of GML geometries supported by this parser, but they are too numerous to list here.

The C function `OGR_G_CreateFromGML()` is the same as this method.

#### Parameters:

*pszData* The GML fragment for the geometry.

#### Returns:

a geometry on succes, or NULL on error.

#### 16.17.2.2 OGRErr **OGRGeometryFactory::createFromWkb** (unsigned char \* *pabyData*, **OGRSpatialReference** \* *poSR*, **OGRGeometry** \*\* *ppoReturn*, int *nBytes* = -1) [static]

Create a geometry object of the appropriate type from it's well known binary representation.

---

Note that if `nBytes` is passed as zero, no checking can be done on whether the `pabyData` is sufficient. This can result in a crash if the input data is corrupt. This function returns no indication of the number of bytes from the data source actually used to represent the returned geometry object. Use **`OGRGeometry::WkbSize()`** (p. 140) on the returned geometry to establish the number of bytes it required in WKB format.

Also note that this is a static method, and that there is no need to instantiate an **`OGRGeometryFactory`** (p. 151) object.

The C function **`OGR_G_CreateFromWkb()`** (p. 355) is the same as this method.

#### Parameters:

***pabyData*** pointer to the input BLOB data.

***poSR*** pointer to the spatial reference to be assigned to the created geometry object. This may be NULL.

***ppoReturn*** the newly created geometry object will be assigned to the indicated pointer on return. This will be NULL in case of failure.

***nBytes*** the number of bytes available in `pabyData`, or -1 if it isn't known.

#### Returns:

`OGRERR_NONE` if all goes well, otherwise any of `OGRERR_NOT_ENOUGH_DATA`, `OGRERR_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRERR_CORRUPT_DATA` may be returned.

References `OGRGeometry::assignSpatialReference()`, `createGeometry()`, and `OGRGeometry::importFromWkb()`.

Referenced by `OGRGeometryCollection::importFromWkb()`, and `OGR_G_CreateFromWkb()`.

#### 16.17.2.3 **`OGRERR OGRGeometryFactory::createFromWkt (char ** ppszData, OGRSpatialReference * poSR, OGRGeometry ** ppoReturn)`** [static]

Create a geometry object of the appropriate type from it's well known text representation.

The C function **`OGR_G_CreateFromWkt()`** (p. 355) is the same as this method.

#### Parameters:

***ppszData*** input zero terminated string containing well known text representation of the geometry to be created. The pointer is updated to point just beyond that last character consumed.

***poSR*** pointer to the spatial reference to be assigned to the created geometry object. This may be NULL.

***ppoReturn*** the newly created geometry object will be assigned to the indicated pointer on return. This will be NULL if the method fails.

#### Example:

```
const char* wkt= "POINT(0 0)";

// cast because OGR_G_CreateFromWkt will move the pointer
char* pszWkt = (char*) wkt.c_str();
OGRSpatialReferenceH ref = OSRNewSpatialReference(NULL);
OGRGeometryH new_geom;
OGRERR err = OGR_G_CreateFromWkt(&pszWkt, ref, &new_geom);
```

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

References OGRGeometry::assignSpatialReference(), and OGRGeometry::importFromWkt().

Referenced by OGRGeometryCollection::importFromWkt(), and OGR\_G\_CreateFromWkt().

#### 16.17.2.4 OGRGeometry \* OGRGeometryFactory::createGeometry (OGRwkbGeometryType *eGeometryType*) [static]

Create an empty geometry of desired type.

This is equivalent to allocating the desired geometry with new, but the allocation is guaranteed to take place in the context of the GDAL/OGR heap.

This method is the same as the C function **OGR\_G\_CreateGeometry()** (p. 356).

**Parameters:**

*eGeometryType* the type code of the geometry class to be instantiated.

**Returns:**

the newly create geometry or NULL on failure.

References wkbGeometryCollection, wkbLinearRing, wkbLineString, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, wkbPoint, and wkbPolygon.

Referenced by createFromWkb(), and OGR\_G\_CreateGeometry().

#### 16.17.2.5 void OGRGeometryFactory::destroyGeometry (OGRGeometry \* *poGeom*) [static]

Destroy geometry object.

Equivalent to invoking delete on a geometry, but it guaranteed to take place within the context of the GDAL/OGR heap.

This method is the same as the C function **OGR\_G\_DestroyGeometry()** (p. 356).

**Parameters:**

*poGeom* the geometry to deallocate.

Referenced by OGR\_G\_DestroyGeometry().

#### 16.17.2.6 OGRGeometry \* OGRGeometryFactory::forceToMultiLineString (OGRGeometry \* *poGeom*) [static]

Convert to multilinestring.

Tries to force the provided geometry to be a multilinestring. Currently this just effects a change on linestrings. The passed in geometry is consumed and a new one returned (or potentially the same one).

**Returns:**

new geometry.

References `OGRMultiLineString::addGeometryDirectly()`, `OGRGeometryCollection::getGeometryRef()`, `OGRGeometry::getGeometryType()`, `OGRGeometryCollection::getNumGeometries()`, `OGRGeometryCollection::removeGeometry()`, `wkbGeometryCollection`, and `wkbLineString`.

#### 16.17.2.7 `OGRGeometry * OGRGeometryFactory::forceToMultiPoint (OGRGeometry * poGeom)` [static]

Convert to multipoint.

Tries to force the provided geometry to be a multipoint. Currently this just effects a change on points. The passed in geometry is consumed and a new one returned (or potentially the same one).

##### Returns:

new geometry.

References `OGRMultiPoint::addGeometryDirectly()`, `OGRGeometryCollection::getGeometryRef()`, `OGRGeometry::getGeometryType()`, `OGRGeometryCollection::getNumGeometries()`, `OGRGeometryCollection::removeGeometry()`, `wkbGeometryCollection`, and `wkbPoint`.

#### 16.17.2.8 `OGRGeometry * OGRGeometryFactory::forceToMultiPolygon (OGRGeometry * poGeom)` [static]

Convert to multipolygon.

Tries to force the provided geometry to be a multipolygon. Currently this just effects a change on polygons. The passed in geometry is consumed and a new one returned (or potentially the same one).

##### Returns:

new geometry.

References `OGRMultiPolygon::addGeometryDirectly()`, `OGRGeometryCollection::getGeometryRef()`, `OGRGeometry::getGeometryType()`, `OGRGeometryCollection::getNumGeometries()`, `OGRGeometryCollection::removeGeometry()`, `wkbGeometryCollection`, and `wkbPolygon`.

#### 16.17.2.9 `OGRGeometry * OGRGeometryFactory::forceToPolygon (OGRGeometry * poGeom)` [static]

Convert to polygon.

Tries to force the provided geometry to be a polygon. Currently this just effects a change on multipolygons. The passed in geometry is consumed and a new one returned (or potentially the same one).

##### Returns:

new geometry.

References `OGRPolygon::addRing()`, `OGRPolygon::getExteriorRing()`, `OGRGeometryCollection::getGeometryRef()`, `OGRGeometry::getGeometryType()`, `OGRPolygon::getInteriorRing()`, `OGRGeometryCollection::getNumGeometries()`, `OGRPolygon::getNumInteriorRings()`, `wkbGeometryCollection`, `wkbMultiPolygon`, and `wkbPolygon`.

---

**16.17.2.10** `int OGRGeometryFactory::haveGEOS () [static]`

Test if GEOS enabled.

This static method returns TRUE if GEOS support is built into OGR, otherwise it returns FALSE.

**Returns:**

TRUE if available, otherwise FALSE.

Referenced by `organizePolygons()`.

**16.17.2.11** `OGRGeometry * OGRGeometryFactory::organizePolygons (OGRGeometry ** papoPolygons, int nPolygonCount, int * pbIsValidGeometry, const char ** papszOptions) [static]`

Organize polygons based on geometries.

Analyse a set of rings (passed as simple polygons), and based on a geometric analysis convert them into a polygon with inner rings, or a MultiPolygon if dealing with more than one polygon.

All the input geometries must be OGRPolygons with only a valid exterior ring (at least 4 points) and no interior rings.

The passed in geometries become the responsibility of the method, but the *papoPolygons* "pointer array" remains owned by the caller.

For faster computation, a polygon is considered to be inside another one if a single point of its external ring is included into the other one. (unless 'OGR\_DEBUG\_ORGANIZE\_POLYGONS' configuration option is set to TRUE. In that case, a slower algorithm that tests exact topological relationships is used if GEOS is available.)

In cases where a big number of polygons is passed to this function, the default processing may be really slow. You can skip the processing by adding METHOD=SKIP to the option list (the result of the function will be a multi-polygon with all polygons as toplevel polygons) or only make it analyze counterclockwise polygons by adding METHOD=ONLY\_CCW to the option list if you can assume that the outline of holes is counterclockwise defined (this is the convention for shapefiles e.g.)

If the OGR\_ORGANIZE\_POLYGONS configuration option is defined, its value will override the value of the METHOD option of *papszOptions* (usefull to modify the behaviour of the shapefile driver)

**Parameters:**

*papoPolygons* array of geometry pointers - should all be OGRPolygons. Ownership of the geometries is passed, but not of the array itself.

*nPolygonCount* number of items in *papoPolygons*

*pbIsValidGeometry* value will be set TRUE if result is valid or FALSE otherwise.

*papszOptions* a list of strings for passing options

**Returns:**

a single resulting geometry (either **OGRPolygon** (p. 201) or **OGRMultiPolygon** (p. 189)).

References `OGRGeometry::getEnvelope()`, `haveGEOS()`, and `wkbPolygon`.

The documentation for this class was generated from the following files:

- `ogr_geometry.h`
- `ogrgeometryfactory.cpp`

## 16.18 OGRLayer Class Reference

```
#include <ogrsgf_frmts.h>
```

Inherited by OGRGenSQLResultsLayer.

### Public Member Functions

- virtual **OGRGeometry** \* **GetSpatialFilter** ()
- virtual void **SetSpatialFilter** (**OGRGeometry** \*)
- virtual void **SetSpatialFilterRect** (double dfMinX, double dfMinY, double dfMaxX, double dfMaxY)
- virtual OGRErr **SetAttributeFilter** (const char \*)
- virtual void **ResetReading** ()=0
- virtual **OGRFeature** \* **GetNextFeature** ()=0
- virtual OGRErr **SetNextByIndex** (long nIndex)
- virtual **OGRFeature** \* **GetFeature** (long nFID)
- virtual OGRErr **SetFeature** (**OGRFeature** \*poFeature)
- virtual OGRErr **CreateFeature** (**OGRFeature** \*poFeature)
- virtual OGRErr **DeleteFeature** (long nFID)
- virtual **OGRFeatureDefn** \* **GetLayerDefn** ()=0
- virtual **OGRSpatialReference** \* **GetSpatialRef** ()
- virtual int **GetFeatureCount** (int bForce=TRUE)
- virtual OGRErr **GetExtent** (**OGREnvelope** \*psExtent, int bForce=TRUE)
- virtual int **TestCapability** (const char \*)=0
- virtual const char \* **GetInfo** (const char \*)
- virtual OGRErr **CreateField** (**OGRFieldDefn** \*poField, int bApproxOK=TRUE)
- virtual OGRErr **SyncToDisk** ()
- **OGRStyleTable** \* **GetStyleTable** ()
- void **SetStyleTableDirectly** (**OGRStyleTable** \*poStyleTable)
- void **SetStyleTable** (**OGRStyleTable** \*poStyleTable)
- virtual const char \* **GetFIDColumn** ()
- virtual const char \* **GetGeometryColumn** ()
- int **Reference** ()
- int **Dereference** ()
- int **GetRefCount** () const

### 16.18.1 Detailed Description

This class represents a layer of simple features, with access methods.

### 16.18.2 Member Function Documentation

#### 16.18.2.1 OGRErr OGRLayer::CreateFeature (**OGRFeature** \**poFeature*) [virtual]

Create and write a new feature within a layer.

The passed feature is written to the layer as a new feature, rather than overwriting an existing one. If the feature has a feature id other than OGRNullFID, then the native implementation may use that as the feature

---

id of the new feature, but not necessarily. Upon successful return the passed feature will have been updated with the new feature id.

This method is the same as the C function **OGR\_L\_CreateFeature()** (p. 367).

**Parameters:**

*poFeature* the feature to write to disk.

**Returns:**

OGRERR\_NONE on success.

**16.18.2.2 OGRErr OGRLayer::CreateField (OGRFieldDefn \* *poField*, int *bApproxOK* = TRUE)**  
[virtual]

Create a new field on a layer. You must use this to create new fields on a real layer. Internally the **OGRFeatureDefn** (p. 113) for the layer will be updated to reflect the new field. Applications should never modify the **OGRFeatureDefn** (p. 113) used by a layer directly.

This function is the same as the C function **OGR\_L\_CreateField()** (p. 368).

**Parameters:**

*poField* field definition to write to disk.

*bApproxOK* If TRUE, the field may be created in a slightly different form depending on the limitations of the format driver.

**Returns:**

OGRERR\_NONE on success.

**16.18.2.3 OGRErr OGRLayer::DeleteFeature (long *nFID*)** [virtual]

Delete feature from layer.

The feature with the indicated feature id is deleted from the layer if supported by the driver. Most drivers do not support feature deletion, and will return OGRERR\_UNSUPPORTED\_OPERATION. The **TestCapability()** (p. 165) layer method may be called with OLCDeleteFeature to check if the driver supports feature deletion.

This method is the same as the C function **OGR\_L\_DeleteFeature()** (p. 368).

**Parameters:**

*poFeature* the feature to write to disk.

**Returns:**

OGRERR\_NONE on success.

---

#### 16.18.2.4 int OGRLayer::Dereference ()

Decrement layer reference count.

This method is the same as the C function `OGR_L_Dereference()`.

##### Returns:

the reference count after decrementing.

#### 16.18.2.5 OGRErr OGRLayer::GetExtent (OGREnvelope \* *psExtent*, int *bForce* = TRUE) [virtual]

`OGR_L_GetFeatureCount( OGRLayerH hLayer, int bForce );`

Fetch the feature count in this layer.

Returns the number of features in the layer. For dynamic databases the count may not be exact. If *bForce* is FALSE, and it would be expensive to establish the feature count a value of -1 may be returned indicating that the count isn't know. If *bForce* is TRUE some implementations will actually scan the entire layer once to count objects.

The returned count takes the spatial filter into account.

This function is the same as the CPP `OGRLayer::GetFeatureCount()` (p. 159).

##### Parameters:

*hLayer* handle to the layer that owned the features.

*bForce* Flag indicating whether the count should be computed even if it is expensive.

##### Returns:

feature count, -1 if count not known.

Fetch the extent of this layer.

Returns the extent (MBR) of the data in the layer. If *bForce* is FALSE, and it would be expensive to establish the extent then `OGRERR_FAILURE` will be returned indicating that the extent isn't know. If *bForce* is TRUE then some implementations will actually scan the entire layer once to compute the MBR of all the features in the layer.

The returned extent does not take the spatial filter into account. If a spatial filter was previously set then it should be ignored but some implementations may be unable to do that, so it is safer to call `GetExtent()` (p. 158) without setting a spatial filter.

Layers without any geometry may return `OGRERR_FAILURE` just indicating that no meaningful extents could be collected.

This method is the same as the C function `OGR_L_GetExtent()` (p. 369).

##### Parameters:

*psExtent* the structure in which the extent value will be returned.

*bForce* Flag indicating whether the extent should be computed even if it is expensive.

##### Returns:

`OGRERR_NONE` on success, `OGRERR_FAILURE` if extent not known.

---

References OGRGeometry::getEnvelope(), OGRFeature::GetGeometryRef(), GetLayerDefn(), GetNextFeature(), OGREnvelope::MaxX, OGREnvelope::MaxY, OGREnvelope::MinX, OGREnvelope::MinY, ResetReading(), and wkbNone.

#### 16.18.2.6 OGRFeature \* OGRLayer::GetFeature (long *nFID*) [virtual]

Fetch a feature by it's identifier.

This function will attempt to read the identified feature. The *nFID* value cannot be OGRNullFID. Success or failure of this operation is unaffected by the spatial or attribute filters.

If this method returns a non-NULL feature, it is guaranteed that it's feature id (**OGRFeature::GetFID()** (p. 102)) will be the same as *nFID*.

Use OGRLayer::TestCapability(OLCRandomRead) to establish if this layer supports efficient random access reading via **GetFeature()** (p. 159); however, the call should always work if the feature exists as a fallback implementation just scans all the features in the layer looking for the desired feature.

Sequential reads are generally considered interrupted by a **GetFeature()** (p. 159) call.

This method is the same as the C function **OGR\_L\_GetFeature()** (p. 369).

##### Parameters:

*nFID* the feature id of the feature to read.

##### Returns:

a feature now owned by the caller, or NULL on failure.

References OGRFeature::GetFID(), GetNextFeature(), and ResetReading().

#### 16.18.2.7 int OGRLayer::GetFeatureCount (int *bForce* = TRUE) [virtual]

Fetch the feature count in this layer.

Returns the number of features in the layer. For dynamic databases the count may not be exact. If *bForce* is FALSE, and it would be expensive to establish the feature count a value of -1 may be returned indicating that the count isn't know. If *bForce* is TRUE some implementations will actually scan the entire layer once to count objects.

The returned count takes the spatial filter into account.

This method is the same as the C function **OGR\_L\_GetFeatureCount()**.

##### Parameters:

*bForce* Flag indicating whether the count should be computed even if it is expensive.

##### Returns:

feature count, -1 if count not known.

References GetNextFeature(), and ResetReading().

#### 16.18.2.8 const char \* OGRLayer::GetFIDColumn () [virtual]

This method returns the name of the underlying database column being used as the FID column, or "" if not supported.

This method is the same as the C function `OGR_L_GetFIDColumn()`.

**Returns:**

fid column name.

**16.18.2.9 `const char * OGRLayer::GetGeometryColumn ()` [virtual]**

This method returns the name of the underlying database column being used as the geometry column, or "" if not supported.

This method is the same as the C function `OGR_L_GetFIDColumn()`.

**Returns:**

fid column name.

**16.18.2.10 `const char * OGRLayer::GetInfo (const char * pszTag)` [virtual]**

Fetch metadata from layer.

This method can be used to fetch various kinds of metadata or layer specific information encoded as a string. It is anticipated that various tag values will be defined with well known semantics, while other tags will be used for driver/application specific purposes.

This method is deprecated and will be replaced with a more general metadata model in the future. At this time no drivers return information via the **GetInfo()** (p. 160) call.

**Parameters:**

*pszTag* the tag for which information is being requested.

**Returns:**

the value of the requested tag, or NULL if that tag does not have a value, or is unknown.

**16.18.2.11 `OGRFeatureDefn * OGRLayer::GetLayerDefn ()` [pure virtual]**

Fetch the schema information for this layer.

The returned **OGRFeatureDefn** (p. 113) is owned by the **OGRLayer** (p. 156), and should not be modified or freed by the application. It encapsulates the attribute schema of the features of the layer.

This method is the same as the C function `OGR_L_GetLayerDefn()` (p. 370).

**Returns:**

feature definition.

Referenced by `OGRDataSource::ExecuteSQL()`, `GetExtent()`, `OGRDataSource::GetLayerByName()`, and `SetAttributeFilter()`.

---

**16.18.2.12 OGRFeature \* OGRLayer::GetNextFeature ()** [pure virtual]

Fetch the next available feature from this layer. The returned feature becomes the responsibility of the caller to delete.

Only features matching the current spatial filter (set with **SetSpatialFilter()** (p. 163)) will be returned.

This method implements sequential access to the features of a layer. The **ResetReading()** (p. 162) method can be used to start at the beginning again.

This method is the same as the C function **OGR\_L\_GetNextFeature()** (p. 370).

**Returns:**

a feature, or NULL if no more features are available.

Referenced by **GetExtent()**, **GetFeature()**, **GetFeatureCount()**, and **SetNextByIndex()**.

**16.18.2.13 int OGRLayer::GetRefCount () const**

Fetch reference count.

This method is the same as the C function **OGR\_L\_GetRefCount()**.

**Returns:**

the current reference count for the layer object itself.

Referenced by **OGRDataSource::GetSummaryRefCount()**.

**16.18.2.14 OGRGeometry \* OGRLayer::GetSpatialFilter ()** [virtual]

This method returns the current spatial filter for this layer.

The returned pointer is to an internally owned object, and should not be altered or deleted by the caller.

This method is the same as the C function **OGR\_L\_GetSpatialFilter()** (p. 370).

**Returns:**

spatial filter geometry.

**16.18.2.15 OGRSpatialReference \* OGRLayer::GetSpatialRef ()** [inline, virtual]

Fetch the spatial reference system for this layer.

The returned object is owned by the **OGRLayer** (p. 156) and should not be modified or freed by the application.

This method is the same as the C function **OGR\_L\_GetSpatialRef()** (p. 371).

**Returns:**

spatial reference, or NULL if there isn't one.

---

**16.18.2.16 void OGRLayer::GetStyleTable () [inline]**

Returns layer style table.

This method is the same as the C function `OGR_L_GetStyleTable()`.

**Returns:**

pointer to a style table which should not be modified or freed by the caller.

**16.18.2.17 int OGRLayer::Reference ()**

Increment layer reference count.

This method is the same as the C function `OGR_L_Reference()`.

**Returns:**

the reference count after incrementing.

**16.18.2.18 void OGRLayer::ResetReading () [pure virtual]**

Reset feature reading to start on the first feature. This affects `GetNextFeature()` (p. 161).

This method is the same as the C function `OGR_L_ResetReading()` (p. 371).

Referenced by `GetExtent()`, `GetFeature()`, `GetFeatureCount()`, `SetAttributeFilter()`, `SetNextByIndex()`, and `SetSpatialFilter()`.

**16.18.2.19 OGRErr OGRLayer::SetAttributeFilter (const char \*pszQuery) [virtual]**

Set a new attribute query.

This method sets the attribute query string to be used when fetching features via the `GetNextFeature()` (p. 161) method. Only features for which the query evaluates as true will be returned.

The query string should be in the format of an SQL WHERE clause. For instance "population > 1000000 and population < 5000000" where population is an attribute in the layer. The query format is a restricted form of SQL WHERE clause as defined "eq\_format=restricted\_where" about half way through this document:

<http://ogdi.sourceforge.net/prop/6.2.CapabilitiesMetadata.html>

Note that installing a query string will generally result in resetting the current reading position (ala `ResetReading()` (p. 162)).

This method is the same as the C function `OGR_L_SetAttributeFilter()` (p. 372).

**Parameters:**

*pszQuery* query in restricted SQL WHERE format, or NULL to clear the current query.

**Returns:**

OGRERR\_NONE if successfully installed, or an error code if the query expression is in error, or some other failure occurs.

References `GetLayerDefn()`, and `ResetReading()`.

**16.18.2.20 OGRErr OGRLayer::SetFeature (OGRFeature \* *poFeature*)** [virtual]

Rewrite an existing feature.

This method will write a feature to the layer, based on the feature id within the **OGRFeature** (p. 99).

Use **OGRLayer::TestCapability(OLCRandomWrite)** to establish if this layer supports random access writing via **SetFeature()** (p. 163).

This method is the same as the C function **OGR\_L\_SetFeature()** (p. 372).

**Parameters:**

*poFeature* the feature to write.

**Returns:**

OGRErr\_NONE if the operation works, otherwise an appropriate error code.

**16.18.2.21 OGRErr OGRLayer::SetNextByIndex (long *nIndex*)** [virtual]

Move read cursor to the *nIndex*'th feature in the current resultset.

This method allows positioning of a layer such that the **GetNextFeature()** (p. 161) call will read the requested feature, where *nIndex* is an absolute index into the current result set. So, setting it to 3 would mean the next feature read with **GetNextFeature()** (p. 161) would have been the 4th feature to have been read if sequential reading took place from the beginning of the layer, including accounting for spatial and attribute filters.

Only in rare circumstances is **SetNextByIndex()** (p. 163) efficiently implemented. In all other cases the default implementation which calls **ResetReading()** (p. 162) and then calls **GetNextFeature()** (p. 161) *nIndex* times is used. To determine if fast seeking is available on the current layer use the **TestCapability()** (p. 165) method with a value of **OLCFastSetNextByIndex**.

This method is the same as the C function **OGR\_L\_SetNextByIndex()**.

**Parameters:**

*nIndex* the index indicating how many steps into the result set to seek.

**Returns:**

OGRErr\_NONE on success or an error code.

References **GetNextFeature()**, and **ResetReading()**.

**16.18.2.22 void OGRLayer::SetSpatialFilter (OGRGeometry \* *poFilter*)** [virtual]

Set a new spatial filter.

This method set the geometry to be used as a spatial filter when fetching features via the **GetNextFeature()** (p. 161) method. Only features that geometrically intersect the filter geometry will be returned.

Currently this test is may be inaccurately implemented, but it is guaranteed that all features who's envelope (as returned by **OGRGeometry::getEnvelope()** (p. 132)) overlaps the envelope of the spatial filter will be returned. This can result in more shapes being returned that should strictly be the case.

---

This method makes an internal copy of the passed geometry. The passed geometry remains the responsibility of the caller, and may be safely destroyed.

For the time being the passed filter geometry should be in the same SRS as the layer (as returned by **OGRLayer::GetSpatialRef()** (p. 161)). In the future this may be generalized.

This method is the same as the C function **OGR\_L\_SetSpatialFilter()** (p. 373).

**Parameters:**

*poFilter* the geometry to use as a filtering region. NULL may be passed indicating that the current spatial filter should be cleared, but no new one instituted.

References **ResetReading()**.

Referenced by **SetSpatialFilterRect()**.

**16.18.2.23 void OGRLayer::SetSpatialFilterRect (double *dfMinX*, double *dfMinY*, double *dfMaxX*, double *dfMaxY*) [virtual]**

Set a new rectangular spatial filter.

This method set rectangle to be used as a spatial filter when fetching features via the **GetNextFeature()** (p. 161) method. Only features that geometrically intersect the given rectangle will be returned.

The x/y values should be in the same coordinate system as the layer as a whole (as returned by **OGRLayer::GetSpatialRef()** (p. 161)). Internally this method is normally implemented as creating a 5 vertex closed rectangular polygon and passing it to **OGRLayer::SetSpatialFilter()** (p. 163). It exists as a convenience.

The only way to clear a spatial filter set with this method is to call **OGRLayer::SetSpatialFilter(NULL)**.

This method is the same as the C function **OGR\_L\_SetSpatialFilterRect()**.

**Parameters:**

*dfMinX* the minimum X coordinate for the rectangular region.

*dfMinY* the minimum Y coordinate for the rectangular region.

*dfMaxX* the maximum X coordinate for the rectangular region.

*dfMaxY* the maximum Y coordinate for the rectangular region.

References **OGRLineString::addPoint()**, **OGRPolygon::addRing()**, and **SetSpatialFilter()**.

**16.18.2.24 void OGRLayer::SetStyleTable (OGRStyleTable \* *poStyleTable*) [inline]**

Set layer style table.

This method operate exactly as **OGRLayer::SetStyleTableDirectly()** (p. 165) except that it does not assume ownership of the passed table.

This method is the same as the C function **OGR\_L\_SetStyleTable()**.

**Parameters:**

*poStyleTable* pointer to style table to set

**16.18.2.25 void OGRLayer::SetStyleTableDirectly (OGRStyleTable \**poStyleTable*) [inline]**

Set layer style table.

This method operate exactly as **OGRLayer::SetStyleTable()** (p. 164) except that it assumes ownership of the passed table.

This method is the same as the C function `OGR_L_SetStyleTableDirectly()`.

**Parameters:**

*poStyleTable* pointer to style table to set

**16.18.2.26 OGRERR OGRLayer::SyncToDisk () [virtual]**

Flush pending changes to disk.

This call is intended to force the layer to flush any pending writes to disk, and leave the disk file in a consistent state. It would not normally have any effect on read-only datasources.

Some layers do not implement this method, and will still return `OGRERR_NONE`. The default implementation just returns `OGRERR_NONE`. An error is only returned if an error occurs while attempting to flush to disk.

This method is the same as the C function `OGR_L_SyncToDisk()`.

**Returns:**

`OGRERR_NONE` if no error occurs (even if nothing is done) or an error code.

Referenced by `OGRDataSource::SyncToDisk()`.

**16.18.2.27 int OGRLayer::TestCapability (const char \**pszCap*) [pure virtual]**

Test if this layer supported the named capability.

The capability codes that can be tested are represented as strings, but defined constants exists to ensure correct spelling. Specific layer types may implement class specific capabilities, but this can't generally be discovered by the caller.

- **OLCRandomRead** / "RandomRead": TRUE if the **GetFeature()** (p. 159) method works for this layer.
- **OLCSequentialWrite** / "SequentialWrite": TRUE if the **CreateFeature()** (p. 156) method works for this layer. Note this means that this particular layer is writable. The same **OGRLayer** (p. 156) class may returned FALSE for other layer instances that are effectively read-only.
- **OLCRandomWrite** / "RandomWrite": TRUE if the **SetFeature()** (p. 163) method is operational on this layer. Note this means that this particular layer is writable. The same **OGRLayer** (p. 156) class may returned FALSE for other layer instances that are effectively read-only.
- **OLCFastSpatialFilter** / "FastSpatialFilter": TRUE if this layer implements spatial filtering efficiently. Layers that effectively read all features, and test them with the **OGRFeature** (p. 99) intersection methods should return FALSE. This can be used as a clue by the application whether it should build and maintain it's own spatial index for features in this layer.

- **OLCFastFeatureCount** / "FastFeatureCount": TRUE if this layer can return a feature count (via **OGRLayer::GetFeatureCount()** (p. 159)) efficiently ... ie. without counting the features. In some cases this will return TRUE until a spatial filter is installed after which it will return FALSE.
- **OLCFastGetExtent** / "FastGetExtent": TRUE if this layer can return its data extent (via **OGRLayer::GetExtent()** (p. 158)) efficiently ... ie. without scanning all the features. In some cases this will return TRUE until a spatial filter is installed after which it will return FALSE.
- **OLCFastSetNextByIndex** / "FastSetNextByIndex": TRUE if this layer can perform the **SetNextByIndex()** (p. 163) call efficiently, otherwise FALSE.

This method is the same as the C function **OGR\_L\_TestCapability()** (p. 374).

**Parameters:**

*pszCap* the name of the capability to test.

**Returns:**

TRUE if the layer has the requested capability, or FALSE otherwise. OGRLayers will return FALSE for any unrecognised capabilities.

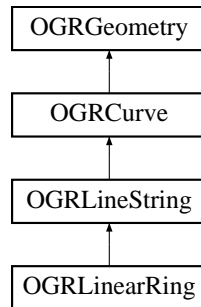
The documentation for this class was generated from the following files:

- **ogrsf\_frmts.h**
- **ogrsf\_frmts.dox**
- **ogrlayer.cpp**

## 16.19 OGRLinearRing Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRLinearRing::



### Public Member Functions

- virtual const char \* **getGeometryName** () const
- virtual **OGRGeometry** \* **clone** () const
- virtual int **isClockwise** () const
- virtual void **closeRings** ()
- virtual double **get\_Area** () const
- virtual int **WkbSize** () const
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)
- virtual OGRErr **exportToWkb** (OGRwkbByteOrder, unsigned char \*) const

### Friends

- class **OGRPolygon**

#### 16.19.1 Detailed Description

Concrete representation of a closed ring.

This class is functionally equivalent to an **OGRLineString** (p. 171), but has a separate identity to maintain alignment with the OpenGIS simple feature data model. It exists to serve as a component of an **OGRPolygon** (p. 201).

The **OGRLinearRing** (p. 167) has no corresponding free standing well known binary representation, so **importFromWkb**() (p. 169) and **exportToWkb**() (p. 168) will not actually work. There is a non-standard GDAL WKT representation though.

Because **OGRLinearRing** (p. 167) is not a "proper" free standing simple features object, it cannot be directly used on a feature via **SetGeometry**(), and cannot generally be used with GEOS for operations like **Intersects**() (p. 135). Instead the polygon should be used, or the **OGRLinearRing** (p. 167) should be converted to an **OGRLineString** (p. 171) for such operations.

---

## 16.19.2 Member Function Documentation

### 16.19.2.1 OGRGeometry \* OGRLinearRing::clone() const [virtual]

Make a copy of this object.

This method relates to the SFCOM IGeometry::clone() method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

#### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Reimplemented from **OGRLineString** (p. 173).

References **OGRGeometry::assignSpatialReference()**, **OGRGeometry::getSpatialReference()**, and **OGRLineString::setPoints()**.

### 16.19.2.2 void OGRLinearRing::closeRings() [virtual]

Force rings to be closed.

If this geometry, or any contained geometries has polygon rings that are not closed, they will be closed by adding the starting point at the end.

Reimplemented from **OGRGeometry** (p. 126).

References **OGRLineString::addPoint()**, **OGRGeometry::getCoordinateDimension()**, **OGRLineString::getX()**, **OGRLineString::getY()**, and **OGRLineString::getZ()**.

### 16.19.2.3 OGRErr OGRLinearRing::exportToWkb (OGRwkbByteOrder *eByteOrder*, unsigned char \* *pabyData*) const [virtual]

Convert a geometry into well known binary format.

This method relates to the SFCOM IWks::ExportToWKB() method.

This method is the same as the C function **OGR\_G\_ExportToWkb()** (p. 357).

#### Parameters:

***eByteOrder*** One of **wkbXDR** or **wkbNDR** indicating MSB or LSB byte order respectively.

***pabyData*** a buffer into which the binary representation is written. This buffer must be at least **OGRGeometry::WkbSize()** (p. 140) byte in size.

#### Returns:

Currently **OGRERR\_NONE** is always returned.

Reimplemented from **OGRLineString** (p. 174).

### 16.19.2.4 double OGRLinearRing::get\_Area() const [virtual]

Compute area of ring.

The area is computed according to Green's Theorem:

Area is  $\text{Sum}(x(i)*y(i+1) - x(i+1)*y(i))/2$  for  $i = 0$  to  $\text{pointCount}-1$ , assuming the last point is a duplicate of the first.

**Returns:**

computed area.

References OGRRawPoint::x, and OGRRawPoint::y.

Referenced by OGRPolygon::get\_Area().

### 16.19.2.5 `const char * OGRLinearRing::getGeometryName () const` [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function `OGR_G_GetGeometryName()` (p. 360).

**Returns:**

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Reimplemented from `OGRLineString` (p. 176).

### 16.19.2.6 `OGRERR OGRLinearRing::importFromWkb (unsigned char * pabyData, int nSize = -1)` [virtual]

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the `OGRGeometryFactory` (p. 151) class, but not normally called by application code.

This method relates to the SFCOM `IWks::ImportFromWKB()` method.

This method is the same as the C function `OGR_G_ImportFromWkb()` (p. 363).

**Parameters:**

*pabyData* the binary input data.

*nSize* the size of *pabyData* in bytes, or zero if not known.

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Reimplemented from `OGRLineString` (p. 178).

### 16.19.2.7 `int OGRLinearRing::isClockwise () const` [virtual]

Returns TRUE if the ring has clockwise winding.

**Returns:**

TRUE if clockwise otherwise FALSE.

References `OGRRawPoint::x`, and `OGRRawPoint::y`.

**16.19.2.8 int OGRLinearRing::WkbSize () const** [virtual]

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the `SFCOM IWks::WkbSize()` method.

This method is the same as the C function `OGR_G_WkbSize()` (p. 366).

**Returns:**

size of binary representation in bytes.

Reimplemented from `OGRLineString` (p. 182).

Referenced by `OGR_G_AddGeometry()`, and `OGR_G_AddGeometryDirectly()`.

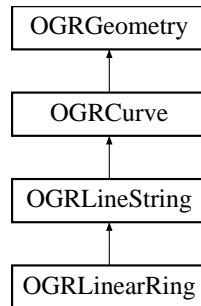
The documentation for this class was generated from the following files:

- `ogr_geometry.h`
- `ogrlinearring.cpp`

## 16.20 OGRLineStyle Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRLineStyle::



### Public Member Functions

- **OGRLineStyle ()**
- virtual int **WkbSize ()** const
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)
- virtual OGRErr **exportToWkb** (OGRwkbByteOrder, unsigned char \*) const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*ppszDstText) const
- virtual int **getDimension ()** const
- virtual **OGRGeometry \* clone ()** const
- virtual void **empty ()**
- virtual void **getEnvelope** (OGREnvelope \*psEnvelope) const
- virtual double **get\_Length ()** const
- virtual void **StartPoint** (OGRPoint \*) const
- virtual void **EndPoint** (OGRPoint \*) const
- virtual void **Value** (double, OGRPoint \*) const
- int **getNumPoints ()** const
- void **getPoint** (int, OGRPoint \*) const
- double **getX** (int i) const
- double **getY** (int i) const
- double **getZ** (int i) const
- virtual OGRBoolean **Equals** (OGRGeometry \*) const
- virtual void **setCoordinateDimension** (int nDimension)
- void **setNumPoints** (int)
- void **setPoint** (int, OGRPoint \*)
- void **setPoint** (int, double, double, double)
- void **setPoints** (int, OGRRawPoint \*, double \*pZ=NULL)
- void **setPoints** (int, double \*padfX, double \*padfY, double \*padfZ=NULL)
- void **addPoint** (OGRPoint \*)
- void **addPoint** (double, double, double)
- void **getPoints** (OGRRawPoint \*, double \*pZ=NULL) const
- void **addSubLineString** (const OGRLineStyle \*, int nStartVertex=0, int nEndVertex=-1)
- virtual OGRwkbGeometryType **getGeometryType ()** const
- virtual const char \* **getGeometryName ()** const
- virtual OGRErr **transform** (OGRCoordinateTransformation \*poCT)
- virtual void **flattenTo2D ()**

### 16.20.1 Detailed Description

Concrete representation of a multi-vertex line.

### 16.20.2 Constructor & Destructor Documentation

#### 16.20.2.1 OGRLineString::OGRLineString ()

Create an empty line string.

Referenced by clone().

### 16.20.3 Member Function Documentation

#### 16.20.3.1 void OGRLineString::addPoint (double *x*, double *y*, double *z*)

Add a point to a line string.

The vertex count of the line string is increased by one, and assigned from the passed location value.

There is no SFCOM analog to this method.

##### Parameters:

*x* the X coordinate to assign to the new point.

*y* the Y coordinate to assign to the new point.

*z* the Z coordinate to assign to the new point (defaults to zero).

References setPoint().

#### 16.20.3.2 void OGRLineString::addPoint (OGRPoint \* *poPoint*)

Add a point to a line string.

The vertex count of the line string is increased by one, and assigned from the passed location value.

There is no SFCOM analog to this method.

##### Parameters:

*poPoint* the point to assign to the new vertex.

References OGRPoint::getX(), OGRPoint::getY(), OGRPoint::getZ(), and setPoint().

Referenced by OGRLinearRing::closeRings(), OGRBuildPolygonFromEdges(), and OGR-Layer::SetSpatialFilterRect().

#### 16.20.3.3 void OGRLineString::addSubLineString (const OGRLineString \* *poOtherLine*, int *nStartVertex* = 0, int *nEndVertex* = -1)

Add a segment of another linestring to this one.

Adds the request range of vertices to the end of this line string in an efficient manner. If the *nStartVertex* is larger than the *nEndVertex* then the vertices will be reversed as they are copied.

---

**Parameters:**

*poOtherLine* the other **OGRLineStyle** (p. 171).

*nStartVertex* the first vertex to copy, defaults to 0 to start with the first vertex in the other linestring.

*nEndVertex* the last vertex to copy, defaults to -1 indicating the last vertex of the other line string.

References `getNumPoints()`, `padfZ`, `paoPoints`, `setNumPoints()`, `OGRRawPoint::x`, and `OGRRawPoint::y`.

**16.20.3.4 OGRGeometry \* OGRLineStyle::clone () const** [virtual]

Make a copy of this object.

This method relates to the SFCOM `IGeometry::clone()` method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

**Returns:**

a new object instance with the same geometry, and spatial reference system as the original.

Implements **OGRGeometry** (p. 126).

Reimplemented in **OGRLinearRing** (p. 168).

References `OGRGeometry::assignSpatialReference()`, `OGRGeometry::getCoordinateDimension()`, `OGRGeometry::getSpatialReference()`, `OGRLineStyle()`, `setCoordinateDimension()`, and `setPoints()`.

**16.20.3.5 void OGRLineStyle::empty ()** [virtual]

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This method relates to the SFCOM `IGeometry::Empty()` method.

This method is the same as the C function **OGR\_G\_Empty()** (p. 357).

Implements **OGRGeometry** (p. 129).

References `setNumPoints()`.

**16.20.3.6 void OGRLineStyle::EndPoint (OGRPoint \* poPoint) const** [virtual]

Return the curve end point.

This method relates to the SF COM `ICurve::get_EndPoint()` method.

**Parameters:**

*poPoint* the point to be assigned the end location.

Implements **OGRCurve** (p. 88).

References `getPoint()`.

Referenced by `Value()`.

### 16.20.3.7 OGRBoolean OGRLineString::Equals (OGRGeometry \* *poOtherGeom*) const [virtual]

Returns true if two geometries are equivalent.

This method is the same as the C function `OGR_G_Equal()`.

#### Returns:

TRUE if equivalent or FALSE otherwise.

Implements **OGRGeometry** (p. 129).

References `getGeometryType()`, `OGRGeometry::getGeometryType()`, `getNumPoints()`, `getX()`, `getY()`, and `getZ()`.

Referenced by `OGRPolygon::Equals()`.

### 16.20.3.8 OGRErr OGRLineString::exportToWkb (OGRwkbByteOrder *eByteOrder*, unsigned char \* *pabyData*) const [virtual]

Convert a geometry into well known binary format.

This method relates to the `SFCOM IWks::ExportToWKB()` method.

This method is the same as the C function `OGR_G_ExportToWkb()` (p. 357).

#### Parameters:

*eByteOrder* One of `wkbXDR` or `wkbNDR` indicating MSB or LSB byte order respectively.

*pabyData* a buffer into which the binary representation is written. This buffer must be at least **OGRGeometry::WkbSize()** (p. 140) byte in size.

#### Returns:

Currently `OGRERR_NONE` is always returned.

Implements **OGRGeometry** (p. 130).

Reimplemented in **OGRLinearRing** (p. 168).

References `OGRGeometry::getCoordinateDimension()`, and `getGeometryType()`.

### 16.20.3.9 OGRErr OGRLineString::exportToWkt (char \*\* *ppszDstText*) const [virtual]

Convert a geometry into well known text format.

This method relates to the `SFCOM IWks::ExportToWKT()` method.

This method is the same as the C function `OGR_G_ExportToWkt()` (p. 358).

#### Parameters:

*ppszDstText* a text buffer is allocated by the program, and assigned to the passed pointer.

#### Returns:

Currently `OGRERR_NONE` is always returned.

---

Implements **OGRGeometry** (p. 130).

References **OGRGeometry::getCoordinateDimension()**, and **getGeometryName()**.

Referenced by **OGRPolygon::exportToWkt()**.

#### 16.20.3.10 void OGRLineString::flattenTo2D () [virtual]

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This method is the same as the C function **OGR\_G\_FlattenTo2D()** (p. 358).

Implements **OGRGeometry** (p. 131).

#### 16.20.3.11 double OGRLineString::get\_Length () const [virtual]

Returns the length of the curve.

This method relates to the SFCOM **ICurve::get\_Length()** method.

##### Returns:

the length of the curve, zero if the curve hasn't been initialized.

Implements **OGRCurve** (p. 89).

References **OGRRawPoint::x**, and **OGRRawPoint::y**.

#### 16.20.3.12 int OGRLineString::getDimension () const [virtual]

Get the dimension of this object.

This method corresponds to the SFCOM **IGeometry::GetDimension()** method. It indicates the dimension of the object, but does not indicate the dimension of the underlying space (as indicated by **OGRGeometry::getCoordinateDimension()** (p. 131)).

This method is the same as the C function **OGR\_G\_GetDimension()** (p. 359).

##### Returns:

0 for points, 1 for lines and 2 for surfaces.

Implements **OGRGeometry** (p. 132).

#### 16.20.3.13 void OGRLineString::getEnvelope (OGREnvelope \* *psEnvelope*) const [virtual]

Computes and returns the bounding envelope for this geometry in the passed *psEnvelope* structure.

This method is the same as the C function **OGR\_G\_GetEnvelope()** (p. 359).

##### Parameters:

*psEnvelope* the structure in which to place the results.

Implements **OGRGeometry** (p. 132).

---

References `OGREnvelope::MaxX`, `OGREnvelope::MaxY`, `OGREnvelope::MinX`, `OGREnvelope::MinY`, `OGRRawPoint::x`, and `OGRRawPoint::y`.

Referenced by `OGRPolygon::getEnvelope()`.

#### 16.20.3.14 `const char * OGRLineString::getGeometryName () const` [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function `OGR_G_GetGeometryName()` (p. 360).

##### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Implements `OGRGeometry` (p. 132).

Reimplemented in `OGRLinearRing` (p. 169).

Referenced by `exportToWkt()`, and `importFromWkt()`.

#### 16.20.3.15 `OGRwkbGeometryType OGRLineString::getGeometryType () const` [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function `OGR_G_GetGeometryType()` (p. 361).

##### Returns:

the geometry type code.

Implements `OGRGeometry` (p. 133).

References `OGRGeometry::getCoordinateDimension()`, `wkbLineString`, and `wkbLineString25D`.

Referenced by `Equals()`, `exportToWkb()`, `OGR_G_AddGeometry()`, and `OGR_G_AddGeometryDirectly()`.

#### 16.20.3.16 `int OGRLineString::getNumPoints () const` [inline]

Fetch vertex count.

Returns the number of vertices in the line string.

##### Returns:

vertex count.

Referenced by `addSubLineString()`, `Equals()`, `OGR_G_GetPointCount()`, and `OGRBuildPolygonFromEdges()`.

---

**16.20.3.17 void OGRLineString::getPoint (int *i*, OGRPoint \* *poPoint*) const**

Fetch a point in line string.

This method relates to the SFCOM ILineString::get\_Point() method.

**Parameters:**

*i* the vertex to fetch, from 0 to **getNumPoints()** (p. 176)-1.

*poPoint* a point to initialize with the fetched point.

References OGRGeometry::getCoordinateDimension(), OGRPoint::setX(), OGRPoint::setY(), and OGRPoint::setZ().

Referenced by EndPoint(), and StartPoint().

**16.20.3.18 void OGRLineString::getPoints (OGRRawPoint \* *paoPointsOut*, double \* *padfZ* = NULL) const**

Returns all points of line string.

This method copies all points into user list. This list must be at least sizeof(OGRRawPoint) \* OGRGeometry::getNumPoints() byte in size. It also copies all Z coordinates.

There is no SFCOM analog to this method.

**Parameters:**

*paoPointsOut* a buffer into which the points is written.

*padfZ* the Z values that go with the points (optional, may be NULL).

**16.20.3.19 double OGRLineString::getX (int *iVertex*) const [inline]**

Get X at vertex.

Returns the X value at the indicated vertex. If *iVertex* is out of range a crash may occur, no internal range checking is performed.

**Parameters:**

*iVertex* the vertex to return, between 0 and **getNumPoints()** (p. 176)-1.

**Returns:**

X value.

Referenced by OGRLinearRing::closeRings(), Equals(), and OGRBuildPolygonFromEdges().

**16.20.3.20 double OGRLineString::getY (int *iVertex*) const [inline]**

Get Y at vertex.

Returns the Y value at the indicated vertex. If *iVertex* is out of range a crash may occur, no internal range checking is performed.

**Parameters:**

*iVertex* the vertex to return, between 0 and `getNumPoints()` (p. 176)-1.

**Returns:**

X value.

Referenced by `OGRLinearRing::closeRings()`, `Equals()`, and `OGRBuildPolygonFromEdges()`.

**16.20.3.21 double OGRLineString::getZ (int iVertex) const**

Get Z at vertex.

Returns the Z (elevation) value at the indicated vertex. If no Z value is available, 0.0 is returned. If *iVertex* is out of range a crash may occur, no internal range checking is performed.

**Parameters:**

*iVertex* the vertex to return, between 0 and `getNumPoints()` (p. 176)-1.

**Returns:**

Z value.

Referenced by `OGRLinearRing::closeRings()`, `Equals()`, and `OGRBuildPolygonFromEdges()`.

**16.20.3.22 OGRErr OGRLineString::importFromWkb (unsigned char \* pabyData, int nSize = -1) [virtual]**

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the `SFCOM IWks::ImportFromWKB()` method.

This method is the same as the C function `OGR_G_ImportFromWkb()` (p. 363).

**Parameters:**

*pabyData* the binary input data.

*nSize* the size of *pabyData* in bytes, or zero if not known.

**Returns:**

`OGRErr_NONE` if all goes well, otherwise any of `OGRErr_NOT_ENOUGH_DATA`, `OGRErr_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRErr_CORRUPT_DATA` may be returned.

Implements **OGRGeometry** (p. 133).

Reimplemented in **OGRLinearRing** (p. 169).

References `setNumPoints()`, and `wkbLineString`.

---

**16.20.3.23 OGRErr OGRLineStyle::importFromWkt (char \*\* *ppszInput*)** [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKT() method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

**Parameters:**

***ppszInput*** pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 134).

References getGeometryName().

**16.20.3.24 void OGRLineStyle::setCoordinateDimension (int *nNewDimension*)** [virtual]

Set the coordinate dimension.

This method sets the explicit coordinate dimension. Setting the coordinate dimension of a geometry to 2 should zero out any existing Z values. Setting the dimension of a geometry collection will not necessarily affect the children geometries.

**Parameters:**

***nNewDimension*** New coordinate dimension value, either 2 or 3.

Reimplemented from **OGRGeometry** (p. 137).

Referenced by clone(), and OGRPolygon::exportToWkt().

**16.20.3.25 void OGRLineStyle::setNumPoints (int *nNewPointCount*)**

Set number of points in geometry.

This method primary exists to preset the number of points in a linestring geometry before **setPoint()** (p. 180) is used to assign them to avoid reallocating the array larger with each call to **addPoint()** (p. 172).

This method has no SFCOM analog.

**Parameters:**

***nNewPointCount*** the new number of points for geometry.

References OGRGeometry::getCoordinateDimension().

Referenced by addSubLineString(), empty(), importFromWkb(), setPoint(), and setPoints().

**16.20.3.26 void OGRLineString::setPoint (int *iPoint*, double *xIn*, double *yIn*, double *zIn*)**

Set the location of a vertex in line string.

If *iPoint* is larger than the number of necessary the number of existing points in the line string, the point count will be increased to accomodate the request.

There is no SFCOM analog to this method.

**Parameters:**

*iPoint* the index of the vertex to assign (zero based).

*xIn* input X coordinate to assign.

*yIn* input Y coordinate to assign.

*zIn* input Z coordinate to assign (defaults to zero).

References OGRGeometry::getCoordinateDimension(), setNumPoints(), OGRRawPoint::x, and OGRRawPoint::y.

**16.20.3.27 void OGRLineString::setPoint (int *iPoint*, OGRPoint \* *poPoint*)**

Set the location of a vertex in line string.

If *iPoint* is larger than the number of necessary the number of existing points in the line string, the point count will be increased to accomodate the request.

There is no SFCOM analog to this method.

**Parameters:**

*iPoint* the index of the vertex to assign (zero based).

*poPoint* the value to assign to the vertex.

References OGRPoint::getX(), OGRPoint::getY(), and OGRPoint::getZ().

Referenced by addPoint().

**16.20.3.28 void OGRLineString::setPoints (int *nPointsIn*, double \* *padfX*, double \* *padfY*, double \* *padfZ* = NULL)**

Assign all points in a line string.

This method clear any existing points assigned to this line string, and assigns a whole new set.

There is no SFCOM analog to this method.

**Parameters:**

*nPointsIn* number of points being passed in padfX and padfY.

*padfX* list of X coordinates of points being assigned.

*padfY* list of Y coordinates of points being assigned.

*padfZ* list of Z coordinates of points being assigned (defaults to NULL for 2D objects).

References setNumPoints(), OGRRawPoint::x, and OGRRawPoint::y.

---

### 16.20.3.29 void OGRLineString::setPoints (int *nPointsIn*, OGRRawPoint \* *paoPointsIn*, double \* *padfZ* = NULL)

Assign all points in a line string.

This method clears any existing points assigned to this line string, and assigns a whole new set. It is the most efficient way of assigning the value of a line string.

There is no SFCOM analog to this method.

#### Parameters:

*nPointsIn* number of points being passed in *paoPointsIn*

*paoPointsIn* list of points being assigned.

*padfZ* the Z values that go with the points (optional, may be NULL).

References OGRGeometry::getCoordinateDimension(), and setNumPoints().

Referenced by clone(), OGRLinearRing::clone(), OGRPolygon::importFromWkt(), OGRMultiPolygon::importFromWkt(), OGRMultiLineString::importFromWkt(), and transform().

### 16.20.3.30 void OGRLineString::StartPoint (OGRPoint \* *poPoint*) const [virtual]

Return the curve start point.

This method relates to the SF COM ICurve::get\_StartPoint() method.

#### Parameters:

*poPoint* the point to be assigned the start location.

Implements **OGRCurve** (p. 89).

References getPoint().

Referenced by Value().

### 16.20.3.31 OGRErr OGRLineString::transform (OGRCoordinateTransformation \* *poCT*) [virtual]

Apply arbitrary coordinate transformation to geometry.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this method does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This method is the same as the C function **OGR\_G\_Transform()** (p. 365).

#### Parameters:

*poCT* the transformation to apply.

**Returns:**

OGRERR\_NONE on success or an error code.

Implements **OGRGeometry** (p. 138).

References **OGRGeometry::assignSpatialReference()**, **OGRCoordinateTransformation::GetTargetCS()**, **setPoints()**, **OGRCoordinateTransformation::Transform()**, **OGRRawPoint::x**, and **OGRRawPoint::y**.

Referenced by **OGRPolygon::transform()**.

### 16.20.3.32 **void OGRLineString::Value (double *dfDistance*, OGRPoint \* *poPoint*) const** [virtual]

Fetch point at given distance along curve.

This method relates to the SF COM ICurve::get\_Value() method.

**Parameters:**

***dfDistance*** distance along the curve at which to sample position. This distance should be between zero and **get\_Length()** (p. 175) for this curve.

***poPoint*** the point to be assigned the curve position.

Implements **OGRCurve** (p. 89).

References **EndPoint()**, **OGRGeometry::getCoordinateDimension()**, **OGRPoint::setX()**, **OGRPoint::setY()**, **OGRPoint::setZ()**, **StartPoint()**, **OGRRawPoint::x**, and **OGRRawPoint::y**.

### 16.20.3.33 **int OGRLineString::WkbSize () const** [virtual]

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the SFCOM IWks::WkbSize() method.

This method is the same as the C function **OGR\_G\_WkbSize()** (p. 366).

**Returns:**

size of binary representation in bytes.

Implements **OGRGeometry** (p. 140).

Reimplemented in **OGRLinearRing** (p. 170).

References **OGRGeometry::getCoordinateDimension()**.

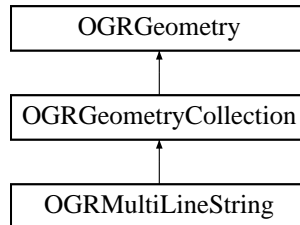
The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- **ogrlinestring.cpp**

## 16.21 OGRMultiLineString Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRMultiLineString::



### Public Member Functions

- virtual const char \* **getGeometryName** () const
- virtual **OGRwkbGeometryType** **getGeometryType** () const
- virtual **OGRGeometry** \* **clone** () const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*) const
- virtual OGRErr **addGeometryDirectly** (OGRGeometry \*)

### 16.21.1 Detailed Description

A collection of OGRLineStrings.

### 16.21.2 Member Function Documentation

#### 16.21.2.1 OGRErr OGRMultiLineString::addGeometryDirectly (OGRGeometry \* *poNewGeom*) [virtual]

Add a geometry directly to the container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. Ownership of the passed geometry is taken by the container rather than cloning as **addGeometry**() (p. 142) does.

This method is the same as the C function **OGR\_G\_AddGeometryDirectly**() (p. 353).

There is no SFCOM analog to this method.

#### Parameters:

*poNewGeom* geometry to add to the container.

#### Returns:

OGRERR\_NONE if successful, or OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

Reimplemented from **OGRGeometryCollection** (p. 142).

References **OGRGeometry::getGeometryType()**, **wkbLineString**, and **wkbLineString25D**.

Referenced by **OGRGeometryFactory::forceToMultiLineString()**, and **importFromWkt()**.

#### 16.21.2.2 **OGRGeometry \* OGRMultiLineString::clone () const** [virtual]

Make a copy of this object.

This method relates to the **SFCOM IGeometry::clone()** method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

##### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Reimplemented from **OGRGeometryCollection** (p. 143).

References **OGRGeometryCollection::addGeometry()**, **OGRGeometry::assignSpatialReference()**, **OGRGeometryCollection::getGeometryRef()**, **OGRGeometryCollection::getNumGeometries()**, and **OGRGeometry::getSpatialReference()**.

#### 16.21.2.3 **OGRERR OGRMultiLineString::exportToWkt (char \*\* ppszDstText) const** [virtual]

Convert a geometry into well known text format.

This method relates to the **SFCOM IWks::ExportToWKT()** method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

##### Parameters:

**ppszDstText** a text buffer is allocated by the program, and assigned to the passed pointer.

##### Returns:

Currently **OGRERR\_NONE** is always returned.

Reimplemented from **OGRGeometryCollection** (p. 144).

References **OGRGeometry::exportToWkt()**, **OGRGeometryCollection::getGeometryRef()**, and **OGRGeometryCollection::getNumGeometries()**.

#### 16.21.2.4 **const char \* OGRMultiLineString::getGeometryName () const** [virtual]

Fetch WKT name for geometry type.

There is no **SFCOM** analog to this method.

This method is the same as the C function **OGR\_G\_GetGeometryName()** (p. 360).

##### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Reimplemented from **OGRGeometryCollection** (p. 146).

Referenced by **importFromWkt()**.

---

### 16.21.2.5 OGRwkbGeometryType OGRMultiLineString::getGeometryType () const

[virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function `OGR_G_GetGeometryType()` (p. 361).

#### Returns:

the geometry type code.

Reimplemented from `OGRGeometryCollection` (p. 146).

References `OGRGeometry::getCoordinateDimension()`, `wkbMultiLineString`, and `wkbMultiLineString25D`.

### 16.21.2.6 OGRErr OGRMultiLineString::importFromWkt (char \*\* *ppszInput*) [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the `OGRGeometryFactory` (p. 151) class, but not normally called by application code.

This method relates to the `SFCOM IWks::ImportFromWKT()` method.

This method is the same as the C function `OGR_G_ImportFromWkt()` (p. 363).

#### Parameters:

*ppszInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

#### Returns:

`OGRErr_NONE` if all goes well, otherwise any of `OGRErr_NOT_ENOUGH_DATA`, `OGRErr_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRErr_CORRUPT_DATA` may be returned.

Reimplemented from `OGRGeometryCollection` (p. 148).

References `addGeometryDirectly()`, `OGRGeometryCollection::empty()`, `getGeometryName()`, and `OGRLineString::setPoints()`.

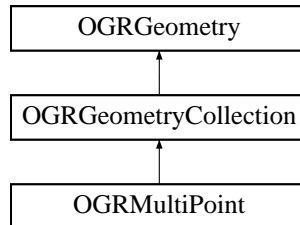
The documentation for this class was generated from the following files:

- `ogr_geometry.h`
- `ogrmultilinestring.cpp`

## 16.22 OGRMultiPoint Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRMultiPoint::



### Public Member Functions

- virtual const char \* **getGeometryName** () const
- virtual **OGRwkbGeometryType** **getGeometryType** () const
- virtual **OGRGeometry** \* **clone** () const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*) const
- virtual OGRErr **addGeometryDirectly** (OGRGeometry \*)

### 16.22.1 Detailed Description

A collection of OGRPoints.

### 16.22.2 Member Function Documentation

#### 16.22.2.1 OGRErr OGRMultiPoint::addGeometryDirectly (OGRGeometry \* *poNewGeom*) [virtual]

Add a geometry directly to the container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. Ownership of the passed geometry is taken by the container rather than cloning as **addGeometry**() (p. 142) does.

This method is the same as the C function **OGR\_G\_AddGeometryDirectly**() (p. 353).

There is no SFCOM analog to this method.

#### Parameters:

*poNewGeom* geometry to add to the container.

#### Returns:

OGRERR\_NONE if successful, or OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

Reimplemented from **OGRGeometryCollection** (p. 142).

References **OGRGeometry::getGeometryType()**, **wkbPoint**, and **wkbPoint25D**.

Referenced by **OGRGeometryFactory::forceToMultiPoint()**, and **importFromWkt()**.

#### 16.22.2.2 **OGRGeometry \* OGRMultiPoint::clone () const** [virtual]

Make a copy of this object.

This method relates to the SFCOM **IGeometry::clone()** method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

##### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Reimplemented from **OGRGeometryCollection** (p. 143).

References **OGRGeometryCollection::addGeometry()**, **OGRGeometry::assignSpatialReference()**, **OGRGeometryCollection::getGeometryRef()**, **OGRGeometryCollection::getNumGeometries()**, and **OGRGeometry::getSpatialReference()**.

#### 16.22.2.3 **OGRERR OGRMultiPoint::exportToWkt (char \*\* ppszDstText) const** [virtual]

Convert a geometry into well known text format.

This method relates to the SFCOM **IWks::ExportToWKT()** method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

##### Parameters:

**ppszDstText** a text buffer is allocated by the program, and assigned to the passed pointer.

##### Returns:

Currently **OGRERR\_NONE** is always returned.

Reimplemented from **OGRGeometryCollection** (p. 144).

References **OGRGeometry::getCoordinateDimension()**, **getGeometryName()**, **OGRGeometryCollection::getGeometryRef()**, **OGRGeometryCollection::getNumGeometries()**, **OGRPoint::getX()**, **OGRPoint::getY()**, and **OGRPoint::getZ()**.

#### 16.22.2.4 **const char \* OGRMultiPoint::getGeometryName () const** [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_GetGeometryName()** (p. 360).

##### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

---

Reimplemented from **OGRGeometryCollection** (p. 146).

Referenced by `exportToWkt()`, and `importFromWkt()`.

#### 16.22.2.5 OGRwkbGeometryType OGRMultiPoint::getGeometryType() const [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function **OGR\_G\_GetGeometryType()** (p. 361).

##### Returns:

the geometry type code.

Reimplemented from **OGRGeometryCollection** (p. 146).

References `OGRGeometry::getCoordinateDimension()`, `wkbMultiPoint`, and `wkbMultiPoint25D`.

#### 16.22.2.6 OGRErr OGRMultiPoint::importFromWkt(char \*\**ppsInput*) [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the `SFCOM IWks::ImportFromWKT()` method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

##### Parameters:

*ppsInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

##### Returns:

`OGRErr_NONE` if all goes well, otherwise any of `OGRErr_NOT_ENOUGH_DATA`, `OGRErr_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRErr_CORRUPT_DATA` may be returned.

Reimplemented from **OGRGeometryCollection** (p. 148).

References `addGeometryDirectly()`, `OGRGeometryCollection::empty()`, and `getGeometryName()`.

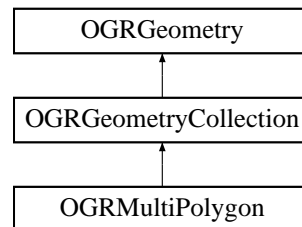
The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- **ogrmultipoint.cpp**

## 16.23 OGRMultiPolygon Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRMultiPolygon::



### Public Member Functions

- virtual const char \* **getGeometryName** () const
- virtual **OGRwkbGeometryType** **getGeometryType** () const
- virtual **OGRGeometry** \* **clone** () const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*) const
- virtual OGRErr **addGeometryDirectly** (**OGRGeometry** \*)
- virtual double **get\_Area** () const

### 16.23.1 Detailed Description

A collection of non-overlapping OGRPolygons.

Note that the IMultiSurface class hasn't been modelled, nor have any of it's methods.

### 16.23.2 Member Function Documentation

#### 16.23.2.1 OGRErr OGRMultiPolygon::addGeometryDirectly (OGRGeometry \* *poNewGeom*) [virtual]

Add a geometry directly to the container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. Ownership of the passed geometry is taken by the container rather than cloning as **addGeometry()** (p. 142) does.

This method is the same as the C function **OGR\_G\_AddGeometryDirectly()** (p. 353).

There is no SFCOM analog to this method.

#### Parameters:

*poNewGeom* geometry to add to the container.

#### Returns:

OGRERR\_NONE if successful, or OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

Reimplemented from **OGRGeometryCollection** (p. 142).

References `OGRGeometry::getGeometryType()`, `wkbPolygon`, and `wkbPolygon25D`.

Referenced by `OGRGeometryFactory::forceToMultiPolygon()`, and `importFromWkt()`.

#### 16.23.2.2 **OGRGeometry \* OGRMultiPolygon::clone () const** [virtual]

Make a copy of this object.

This method relates to the `SFCOM IGeometry::clone()` method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

##### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Reimplemented from **OGRGeometryCollection** (p. 143).

References `OGRGeometryCollection::addGeometry()`, `OGRGeometry::assignSpatialReference()`, `OGRGeometryCollection::getGeometryRef()`, `OGRGeometryCollection::getNumGeometries()`, and `OGRGeometry::getSpatialReference()`.

#### 16.23.2.3 **OGRERR OGRMultiPolygon::exportToWkt (char \*\* ppszDstText) const** [virtual]

Convert a geometry into well known text format.

This method relates to the `SFCOM IWks::ExportToWKT()` method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

##### Parameters:

*ppszDstText* a text buffer is allocated by the program, and assigned to the passed pointer.

##### Returns:

Currently `OGRERR_NONE` is always returned.

Reimplemented from **OGRGeometryCollection** (p. 144).

References `OGRGeometry::exportToWkt()`, `OGRGeometryCollection::getGeometryRef()`, and `OGRGeometryCollection::getNumGeometries()`.

#### 16.23.2.4 **double OGRMultiPolygon::get\_Area () const** [virtual]

Compute area of multipolygon.

The area is computed as the sum of the areas of all polygon members in this collection.

##### Returns:

computed area.

Reimplemented from **OGRGeometryCollection** (p. 145).

References `OGRPolygon::get_Area()`, `OGRGeometryCollection::getGeometryRef()`, and `OGRGeometryCollection::getNumGeometries()`.

---

**16.23.2.5 const char \* OGRMultiPolygon::getGeometryName () const** [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_GetGeometryName()** (p. 360).

**Returns:**

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Reimplemented from **OGRGeometryCollection** (p. 146).

Referenced by `importFromWkt()`.

**16.23.2.6 OGRwkbGeometryType OGRMultiPolygon::getGeometryType () const** [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function **OGR\_G\_GetGeometryType()** (p. 361).

**Returns:**

the geometry type code.

Reimplemented from **OGRGeometryCollection** (p. 146).

References `OGRGeometry::getCoordinateDimension()`, `wkbMultiPolygon`, and `wkbMultiPolygon25D`.

**16.23.2.7 OGRErr OGRMultiPolygon::importFromWkt (char \*\* *ppszInput*)** [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM `IWks::ImportFromWKT()` method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

**Parameters:**

*ppszInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

**Returns:**

`OGRErr_NONE` if all goes well, otherwise any of `OGRErr_NOT_ENOUGH_DATA`, `OGRErr_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRErr_CORRUPT_DATA` may be returned.

Reimplemented from **OGRGeometryCollection** (p. 148).

---

References    `addGeometryDirectly()`,    `OGRPolygon::addRingDirectly()`,    `OGRGeometryCollection::empty()`, `getGeometryName()`, and `OGRLineString::setPoints()`.

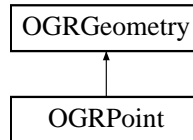
The documentation for this class was generated from the following files:

- **`ogr_geometry.h`**
  - `ogrmultipolygon.cpp`
-

## 16.24 OGRPoint Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRPoint::



### Public Member Functions

- **OGRPoint** ()
- virtual int **WkbSize** () const
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)
- virtual OGRErr **exportToWkb** (OGRwkbByteOrder, unsigned char \*) const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*ppszDstText) const
- virtual int **getDimension** () const
- virtual **OGRGeometry** \* **clone** () const
- virtual void **empty** ()
- virtual void **getEnvelope** (OGREnvelope \*psEnvelope) const
- double **getX** () const
- double **getY** () const
- double **getZ** () const
- virtual void **setCoordinateDimension** (int nDimension)
- void **setX** (double xIn)
- void **setY** (double yIn)
- void **setZ** (double zIn)
- virtual OGRBoolean **Equals** (**OGRGeometry** \*) const
- virtual const char \* **getGeometryName** () const
- virtual **OGRwkbGeometryType** **getGeometryType** () const
- virtual OGRErr **transform** (**OGRCoordinateTransformation** \*poCT)
- virtual void **flattenTo2D** ()

### 16.24.1 Detailed Description

Point class.

Implements SFCOM IPoint methods.

### 16.24.2 Constructor & Destructor Documentation

#### 16.24.2.1 OGRPoint::OGRPoint ()

Create a (0,0) point.

Referenced by clone().

### 16.24.3 Member Function Documentation

#### 16.24.3.1 **OGRGeometry \* OGRPoint::clone () const** [virtual]

Make a copy of this object.

This method relates to the SFCOM IGeometry::clone() method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

**Returns:**

a new object instance with the same geometry, and spatial reference system as the original.

Implements **OGRGeometry** (p. 126).

References **OGRGeometry::assignSpatialReference()**, **OGRGeometry::getSpatialReference()**, **OGRPoint()**, and **setCoordinateDimension()**.

#### 16.24.3.2 **void OGRPoint::empty ()** [virtual]

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This method relates to the SFCOM IGeometry::Empty() method.

This method is the same as the C function **OGR\_G\_Empty()** (p. 357).

Implements **OGRGeometry** (p. 129).

Referenced by **importFromWkt()**.

#### 16.24.3.3 **OGRBoolean OGRPoint::Equals (OGRGeometry \* *poOtherGeom*) const** [virtual]

Returns two if two geometries are equivalent.

This method is the same as the C function **OGR\_G\_Equal()**.

**Returns:**

TRUE if equivalent or FALSE otherwise.

Implements **OGRGeometry** (p. 129).

References **getGeometryType()**, **OGRGeometry::getGeometryType()**, **getX()**, **getY()**, and **getZ()**.

#### 16.24.3.4 **OGRErr OGRPoint::exportToWkb (OGRwkbByteOrder *eByteOrder*, unsigned char \* *pabyData*) const** [virtual]

Convert a geometry into well known binary format.

This method relates to the SFCOM IWks::ExportToWKB() method.

This method is the same as the C function **OGR\_G\_ExportToWkb()** (p. 357).

**Parameters:**

***eByteOrder*** One of **wkbXDR** or **wkbNDR** indicating MSB or LSB byte order respectively.

*pabyData* a buffer into which the binary representation is written. This buffer must be at least **OGRGeometry::WkbSize()** (p. 140) byte in size.

**Returns:**

Currently OGRERR\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

References `getGeometryType()`.

**16.24.3.5 OGRErr OGRPoint::exportToWkt (char \*\* ppszDstText) const** [virtual]

Convert a geometry into well known text format.

This method relates to the SFCOM IWks::ExportToWKT() method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

**Parameters:**

*ppszDstText* a text buffer is allocated by the program, and assigned to the passed pointer.

**Returns:**

Currently OGRERR\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

**16.24.3.6 void OGRPoint::flattenTo2D ()** [virtual]

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This method is the same as the C function **OGR\_G\_FlattenTo2D()** (p. 358).

Implements **OGRGeometry** (p. 131).

**16.24.3.7 int OGRPoint::getDimension () const** [virtual]

Get the dimension of this object.

This method corresponds to the SFCOM IGeometry::GetDimension() method. It indicates the dimension of the object, but does not indicate the dimension of the underlying space (as indicated by **OGRGeometry::getCoordinateDimension()** (p. 131)).

This method is the same as the C function **OGR\_G\_GetDimension()** (p. 359).

**Returns:**

0 for points, 1 for lines and 2 for surfaces.

Implements **OGRGeometry** (p. 132).

---

**16.24.3.8 void OGRPoint::getEnvelope (OGREnvelope \* *psEnvelope*) const** [virtual]

Computes and returns the bounding envelope for this geometry in the passed *psEnvelope* structure.

This method is the same as the C function **OGR\_G\_GetEnvelope()** (p. 359).

**Parameters:**

*psEnvelope* the structure in which to place the results.

Implements **OGRGeometry** (p. 132).

References `getX()`, `getY()`, `OGREnvelope::MaxX`, `OGREnvelope::MaxY`, `OGREnvelope::MinX`, and `OGREnvelope::MinY`.

**16.24.3.9 const char \* OGRPoint::getGeometryName () const** [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function **OGR\_G\_GetGeometryName()** (p. 360).

**Returns:**

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Implements **OGRGeometry** (p. 132).

**16.24.3.10 OGRwkbGeometryType OGRPoint::getGeometryType () const** [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function **OGR\_G\_GetGeometryType()** (p. 361).

**Returns:**

the geometry type code.

Implements **OGRGeometry** (p. 133).

References `wkbPoint`, and `wkbPoint25D`.

Referenced by `OGRPolygon::Centroid()`, `Equals()`, `exportToWkb()`, and `OGRPolygon::PointOnSurface()`.

**16.24.3.11 double OGRPoint::getX () const** [inline]

Fetch X coordinate.

Relates to the SFCOM `IPoint::get_X()` method.

---

**Returns:**

the X coordinate of this point.

Referenced by OGRLineString::addPoint(), OGRPolygon::Centroid(), Equals(), OGRMultiPoint::exportToWkt(), OGRCurve::get\_IsClosed(), getEnvelope(), OGRPolygon::PointOnSurface(), and OGRLineString::setPoint().

**16.24.3.12 double OGRPoint::getY () const [inline]**

Fetch Y coordinate.

Relates to the SFCOM IPoint::get\_Y() method.

**Returns:**

the Y coordinate of this point.

Referenced by OGRLineString::addPoint(), OGRPolygon::Centroid(), Equals(), OGRMultiPoint::exportToWkt(), OGRCurve::get\_IsClosed(), getEnvelope(), OGRPolygon::PointOnSurface(), and OGRLineString::setPoint().

**16.24.3.13 double OGRPoint::getZ () const [inline]**

Fetch Z coordinate.

Relates to the SFCOM IPoint::get\_Z() method.

**Returns:**

the Z coordinate of this point, or zero if it is a 2D point.

Referenced by OGRLineString::addPoint(), Equals(), OGRMultiPoint::exportToWkt(), and OGRLineString::setPoint().

**16.24.3.14 OGRErr OGRPoint::importFromWkb (unsigned char \* *pabyData*, int *nSize* = -1) [virtual]**

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKB() method.

This method is the same as the C function **OGR\_G\_ImportFromWkb()** (p. 363).

**Parameters:**

*pabyData* the binary input data.

*nSize* the size of pabyData in bytes, or zero if not known.

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 133).

References `wkbPoint`.

#### 16.24.3.15 **OGRERR OGRPoint::importFromWkt (char \*\* *ppszInput*)** [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the `SFCOM IWks::ImportFromWKT()` method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

##### Parameters:

***ppszInput*** pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

##### Returns:

`OGRERR_NONE` if all goes well, otherwise any of `OGRERR_NOT_ENOUGH_DATA`, `OGRERR_UNSUPPORTED_GEOMETRY_TYPE`, or `OGRERR_CORRUPT_DATA` may be returned.

Implements **OGRGeometry** (p. 134).

References `empty()`, `OGRRawPoint::x`, and `OGRRawPoint::y`.

#### 16.24.3.16 **void OGRPoint::setCoordinateDimension (int *nNewDimension*)** [virtual]

Set the coordinate dimension.

This method sets the explicit coordinate dimension. Setting the coordinate dimension of a geometry to 2 should zero out any existing Z values. Setting the dimension of a geometry collection will not necessarily affect the children geometries.

##### Parameters:

***nNewDimension*** New coordinate dimension value, either 2 or 3.

Reimplemented from **OGRGeometry** (p. 137).

Referenced by `clone()`.

#### 16.24.3.17 **void OGRPoint::setX (double *xIn*)** [inline]

Assign point X coordinate.

There is no corresponding `SFCOM` method.

Referenced by `OGRPolygon::Centroid()`, `OGRLineString::getPoint()`, `OGRPolygon::PointOnSurface()`, and `OGRLineString::Value()`.

---

**16.24.3.18 void OGRPoint::setY (double yIn) [inline]**

Assign point Y coordinate.

There is no corresponding SFCOM method.

Referenced by OGRPolygon::Centroid(), OGRLineString::getPoint(), OGRPolygon::PointOnSurface(), and OGRLineString::Value().

**16.24.3.19 void OGRPoint::setZ (double zIn) [inline]**

Assign point Z coordinate. Calling this method will force the geometry coordinate dimension to 3D (wkbPoint|wkbZ).

There is no corresponding SFCOM method.

Referenced by OGRLineString::getPoint(), and OGRLineString::Value().

**16.24.3.20 OGRErr OGRPoint::transform (OGRCoordinateTransformation \* poCT) [virtual]**

Apply arbitrary coordinate transformation to geometry.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this method does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This method is the same as the C function **OGR\_G\_Transform()** (p. 365).

**Parameters:**

*poCT* the transformation to apply.

**Returns:**

OGRERR\_NONE on success or an error code.

Implements **OGRGeometry** (p. 138).

References OGRGeometry::assignSpatialReference(), OGRCoordinateTransformation::GetTargetCS(), and OGRCoordinateTransformation::Transform().

**16.24.3.21 int OGRPoint::WkbSize () const [virtual]**

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the SFCOM IWks::WkbSize() method.

This method is the same as the C function **OGR\_G\_WkbSize()** (p. 366).

**Returns:**

size of binary representation in bytes.

Implements **OGRGeometry** (p. 140).

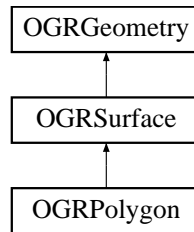
The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- ogrpoint.cpp

## 16.25 OGRPolygon Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRPolygon::



### Public Member Functions

- **OGRPolygon ()**
- virtual const char \* **getGeometryName ()** const
- virtual **OGRwkbGeometryType** **getGeometryType ()** const
- virtual **OGRGeometry** \* **clone ()** const
- virtual void **empty ()**
- virtual OGRErr **transform (OGRCoordinateTransformation \*poCT)**
- virtual void **flattenTo2D ()**
- virtual double **get\_Area ()** const
- virtual int **Centroid (OGRPoint \*poPoint)** const
- virtual int **PointOnSurface (OGRPoint \*poPoint)** const
- virtual int **WkbSize ()** const
- virtual OGRErr **importFromWkb** (unsigned char \*, int=-1)
- virtual OGRErr **exportToWkb** (OGRwkbByteOrder, unsigned char \*) const
- virtual OGRErr **importFromWkt** (char \*\*)
- virtual OGRErr **exportToWkt** (char \*\*ppszDstText) const
- virtual int **getDimension ()** const
- virtual void **getEnvelope (OGREnvelope \*psEnvelope)** const
- virtual OGRBoolean **Equals (OGRGeometry \*)** const
- virtual void **setCoordinateDimension** (int nDimension)
- void **addRing (OGRLinearRing \*)**
- void **addRingDirectly (OGRLinearRing \*)**
- **OGRLinearRing** \* **getExteriorRing ()**
- int **getNumInteriorRings ()** const
- **OGRLinearRing** \* **getInteriorRing** (int)
- virtual void **closeRings ()**

### 16.25.1 Detailed Description

Concrete class representing polygons.

Note that the OpenGIS simple features polygons consist of one outer ring, and zero or more inner rings. A polygon cannot represent disconnected regions (such as multiple islands in a political body). The **OGR-MultiPolygon** (p. 189) must be used for this.

## 16.25.2 Constructor & Destructor Documentation

### 16.25.2.1 OGRPolygon::OGRPolygon ()

Create an empty polygon.

## 16.25.3 Member Function Documentation

### 16.25.3.1 void OGRPolygon::addRing (OGRLinearRing \* *poNewRing*)

Add a ring to a polygon.

If the polygon has no external ring (it is empty) this will be used as the external ring, otherwise it is used as an internal ring. The passed **OGRLinearRing** (p. 167) remains the responsibility of the caller (an internal copy is made).

This method has no SFCOM analog.

#### Parameters:

*poNewRing* ring to be added to the polygon.

References OGRGeometry::getCoordinateDimension().

Referenced by clone(), OGRGeometryFactory::forceToPolygon(), and OGRLayer::SetSpatialFilterRect().

### 16.25.3.2 void OGRPolygon::addRingDirectly (OGRLinearRing \* *poNewRing*)

Add a ring to a polygon.

If the polygon has no external ring (it is empty) this will be used as the external ring, otherwise it is used as an internal ring. Ownership of the passed ring is assumed by the **OGRPolygon** (p. 201), but otherwise this method operates the same as OGRPolygon::AddRing().

This method has no SFCOM analog.

#### Parameters:

*poNewRing* ring to be added to the polygon.

References OGRGeometry::getCoordinateDimension().

Referenced by OGRMultiPolygon::importFromWkt(), and OGRBuildPolygonFromEdges().

### 16.25.3.3 int OGRPolygon::Centroid (OGRPoint \* *poPoint*) const [virtual]

Compute the polygon centroid.

The centroid location is applied to the passed in **OGRPoint** (p. 193) object.

#### Returns:

OGRERR\_NONE on success or OGRERR\_FAILURE on error.

---

Implements **OGRSurface** (p. 260).

References `OGRPoint::getGeometryType()`, `OGRPoint::getX()`, `OGRPoint::getY()`, `OGRPoint::setX()`, `OGRPoint::setY()`, and `wkbPoint`.

#### 16.25.3.4 **OGRGeometry \* OGRPolygon::clone () const** [virtual]

Make a copy of this object.

This method relates to the SFCOM `IGeometry::clone()` method.

This method is the same as the C function **OGR\_G\_Clone()** (p. 354).

##### Returns:

a new object instance with the same geometry, and spatial reference system as the original.

Implements **OGRGeometry** (p. 126).

References `addRing()`, `OGRGeometry::assignSpatialReference()`, and `OGRGeometry::getSpatialReference()`.

#### 16.25.3.5 **void OGRPolygon::closeRings ()** [virtual]

Force rings to be closed.

If this geometry, or any contained geometries has polygon rings that are not closed, they will be closed by adding the starting point at the end.

Reimplemented from **OGRGeometry** (p. 126).

#### 16.25.3.6 **void OGRPolygon::empty ()** [virtual]

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This method relates to the SFCOM `IGeometry::Empty()` method.

This method is the same as the C function **OGR\_G\_Empty()** (p. 357).

Implements **OGRGeometry** (p. 129).

#### 16.25.3.7 **OGRBoolean OGRPolygon::Equals (OGRGeometry \* poOtherGeom) const** [virtual]

Returns true if two geometries are equivalent.

This method is the same as the C function **OGR\_G\_Equal()**.

##### Returns:

TRUE if equivalent or FALSE otherwise.

Implements **OGRGeometry** (p. 129).

References `OGRLineString::Equals()`, `getExteriorRing()`, `getGeometryType()`, `OGRGeometry::getGeometryType()`, `getInteriorRing()`, and `getNumInteriorRings()`.

### 16.25.3.8 OGRErr OGRPolygon::exportToWkb (OGRwkbByteOrder *eByteOrder*, unsigned char \**pabyData*) const [virtual]

Convert a geometry into well known binary format.

This method relates to the SFCOM IWks::ExportToWKB() method.

This method is the same as the C function **OGR\_G\_ExportToWkb()** (p. 357).

#### Parameters:

*eByteOrder* One of wkbXDR or wkbNDR indicating MSB or LSB byte order respectively.

*pabyData* a buffer into which the binary representation is written. This buffer must be at least **OGRGeometry::WkbSize()** (p. 140) byte in size.

#### Returns:

Currently OGRErr\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

References **OGRLinearRing::\_exportToWkb()**, **OGRLinearRing::\_WkbSize()**, **OGRGeometry::getCoordinateDimension()**, and **getGeometryType()**.

### 16.25.3.9 OGRErr OGRPolygon::exportToWkt (char \*\**ppszDstText*) const [virtual]

Convert a geometry into well known text format.

This method relates to the SFCOM IWks::ExportToWKT() method.

This method is the same as the C function **OGR\_G\_ExportToWkt()** (p. 358).

#### Parameters:

*ppszDstText* a text buffer is allocated by the program, and assigned to the passed pointer.

#### Returns:

Currently OGRErr\_NONE is always returned.

Implements **OGRGeometry** (p. 130).

References **OGRLineString::exportToWkt()**, **OGRGeometry::getCoordinateDimension()**, and **OGRLineString::setCoordinateDimension()**.

### 16.25.3.10 void OGRPolygon::flattenTo2D () [virtual]

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This method is the same as the C function **OGR\_G\_FlattenTo2D()** (p. 358).

Implements **OGRGeometry** (p. 131).

### 16.25.3.11 double OGRPolygon::get\_Area () const [virtual]

Compute area of polygon.

The area is computed as the area of the outer ring less the area of all internal rings.

---

**Returns:**

computed area.

Implements **OGRSurface** (p. 260).

References **OGRLinearRing::get\_Area()**, **getExteriorRing()**, **getInteriorRing()**, and **getNumInteriorRings()**.

Referenced by **OGRMultiPolygon::get\_Area()**.

**16.25.3.12 int OGRPolygon::getDimension () const** [virtual]

Get the dimension of this object.

This method corresponds to the SFCOM **IGeometry::GetDimension()** method. It indicates the dimension of the object, but does not indicate the dimension of the underlying space (as indicated by **OGRGeometry::getCoordinateDimension()** (p. 131)).

This method is the same as the C function **OGR\_G\_GetDimension()** (p. 359).

**Returns:**

0 for points, 1 for lines and 2 for surfaces.

Implements **OGRGeometry** (p. 132).

**16.25.3.13 void OGRPolygon::getEnvelope (OGREnvelope \* *psEnvelope*) const** [virtual]

Computes and returns the bounding envelope for this geometry in the passed *psEnvelope* structure.

This method is the same as the C function **OGR\_G\_GetEnvelope()** (p. 359).

**Parameters:**

*psEnvelope* the structure in which to place the results.

Implements **OGRGeometry** (p. 132).

References **OGRLineString::getEnvelope()**, **OGREnvelope::MaxX**, **OGREnvelope::MaxY**, **OGREnvelope::MinX**, and **OGREnvelope::MinY**.

**16.25.3.14 OGRLinearRing \* OGRPolygon::getExteriorRing ()**

Fetch reference to external polygon ring.

Note that the returned ring pointer is to an internal data object of the **OGRPolygon** (p. 201). It should not be modified or deleted by the application, and the pointer is only valid till the polygon is next modified. Use the **OGRGeometry::clone()** (p. 126) method to make a separate copy within the application.

Relates to the SFCOM **IPolygon::get\_ExteriorRing()** method.

**Returns:**

pointer to external ring. May be NULL if the **OGRPolygon** (p. 201) is empty.

Referenced by **Equals()**, **OGRGeometryFactory::forceToPolygon()**, and **get\_Area()**.

---

### 16.25.3.15 `const char * OGRPolygon::getGeometryName () const` [virtual]

Fetch WKT name for geometry type.

There is no SFCOM analog to this method.

This method is the same as the C function `OGR_G_GetGeometryName()` (p. 360).

#### Returns:

name used for this geometry type in well known text format. The returned pointer is to a static internal string and should not be modified or freed.

Implements `OGRGeometry` (p. 132).

### 16.25.3.16 `OGRwkbGeometryType OGRPolygon::getGeometryType () const` [virtual]

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This method is the same as the C function `OGR_G_GetGeometryType()` (p. 361).

#### Returns:

the geometry type code.

Implements `OGRGeometry` (p. 133).

References `OGRGeometry::getCoordinateDimension()`, `wkbPolygon`, and `wkbPolygon25D`.

Referenced by `Equals()`, and `exportToWkb()`.

### 16.25.3.17 `OGRLinearRing * OGRPolygon::getInteriorRing (int iRing)`

Fetch reference to indicated internal ring.

Note that the returned ring pointer is to an internal data object of the `OGRPolygon` (p. 201). It should not be modified or deleted by the application, and the pointer is only valid till the polygon is next modified. Use the `OGRGeometry::clone()` (p. 126) method to make a separate copy within the application.

Relates to the SFCOM `IPolygon::get_InternalRing()` method.

#### Parameters:

*iRing* internal ring index from 0 to `getNumInternalRings() - 1`.

#### Returns:

pointer to external ring. May be NULL if the `OGRPolygon` (p. 201) is empty.

Referenced by `Equals()`, `OGRGeometryFactory::forceToPolygon()`, and `get_Area()`.

### 16.25.3.18 `int OGRPolygon::getNumInteriorRings () const`

Fetch the number of internal rings.

Relates to the SFCOM `IPolygon::get_NumInteriorRings()` method.

---

**Returns:**

count of internal rings, zero or more.

Referenced by Equals(), OGRGeometryFactory::forceToPolygon(), get\_Area(), and OGRBuildPolygonFromEdges().

### 16.25.3.19 OGRErr OGRPolygon::importFromWkb (unsigned char \* *pabyData*, int *nSize* = -1) [virtual]

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKB() method.

This method is the same as the C function **OGR\_G\_ImportFromWkb()** (p. 363).

**Parameters:**

*pabyData* the binary input data.

*nSize* the size of pabyData in bytes, or zero if not known.

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 133).

References OGRLinearRing::\_importFromWkb(), OGRLinearRing::\_WkbSize(), and wkbPolygon.

### 16.25.3.20 OGRErr OGRPolygon::importFromWkt (char \*\* *ppszInput*) [virtual]

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type. This method is used by the **OGRGeometryFactory** (p. 151) class, but not normally called by application code.

This method relates to the SFCOM IWks::ImportFromWKT() method.

This method is the same as the C function **OGR\_G\_ImportFromWkt()** (p. 363).

**Parameters:**

*ppszInput* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

**Returns:**

OGRERR\_NONE if all goes well, otherwise any of OGRERR\_NOT\_ENOUGH\_DATA, OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRERR\_CORRUPT\_DATA may be returned.

Implements **OGRGeometry** (p. 134).

References OGRLineString::setPoints().

---

### 16.25.3.21 **int OGRPolygon::PointOnSurface (OGRPoint \* *poPoint*) const** [virtual]

This method relates to the SFCOM ISurface::get\_PointOnSurface() method.

NOTE: Only implemented when GEOS included in build.

#### Parameters:

*poPoint* point to be set with an internal point.

#### Returns:

OGRERR\_NONE if it succeeds or OGRERR\_FAILURE otherwise.

Implements **OGRSurface** (p. 261).

References OGRPoint::getGeometryType(), OGRPoint::getX(), OGRPoint::getY(), OGRPoint::setX(), OGRPoint::setY(), and wkbPoint.

### 16.25.3.22 **void OGRPolygon::setCoordinateDimension (int *nNewDimension*)** [virtual]

Set the coordinate dimension.

This method sets the explicit coordinate dimension. Setting the coordinate dimension of a geometry to 2 should zero out any existing Z values. Setting the dimension of a geometry collection will not necessarily affect the children geometries.

#### Parameters:

*nNewDimension* New coordinate dimension value, either 2 or 3.

Reimplemented from **OGRGeometry** (p. 137).

### 16.25.3.23 **OGRERR OGRPolygon::transform (OGRCoordinateTransformation \* *poCT*)** [virtual]

Apply arbitrary coordinate transformation to geometry.

This method will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this method does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This method is the same as the C function **OGR\_G\_Transform()** (p. 365).

#### Parameters:

*poCT* the transformation to apply.

#### Returns:

OGRERR\_NONE on success or an error code.

Implements **OGRGeometry** (p. 138).

References **OGRGeometry::assignSpatialReference()**, **OGRCoordinateTransformation::GetTargetCS()**, and **OGRLineString::transform()**.

#### 16.25.3.24 **int OGRPolygon::WkbSize () const** [virtual]

Returns size of related binary representation.

This method returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This method relates to the **SFCOM IWks::WkbSize()** method.

This method is the same as the C function **OGR\_G\_WkbSize()** (p. 366).

#### Returns:

size of binary representation in bytes.

Implements **OGRGeometry** (p. 140).

References **OGRLinearRing::\_WkbSize()**, and **OGRGeometry::getCoordinateDimension()**.

The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- **ogrpolygon.cpp**

## 16.26 OGRRawPoint Class Reference

```
#include <ogr_geometry.h>
```

### 16.26.1 Detailed Description

Simple container for a position.

The documentation for this class was generated from the following file:

- **ogr\_geometry.h**

## 16.27 OGRSFDriver Class Reference

```
#include <ogr_sfrmts.h>
```

### Public Member Functions

- virtual const char \* **GetName** ()=0
- virtual **OGRDataSource** \* **Open** (const char \*pszName, int bUpdate=FALSE)=0
- virtual int **TestCapability** (const char \*)=0
- virtual **OGRDataSource** \* **CreateDataSource** (const char \*pszName, char \*\*=NULL)
- virtual OGRErr **DeleteDataSource** (const char \*pszName)

### 16.27.1 Detailed Description

Represents an operational format driver.

One **OGRSFDriver** (p. 211) derived class will normally exist for each file format registered for use, regardless of whether a file has or will be opened. The list of available drivers is normally managed by the **OGRSFDriverRegistrar** (p. 214).

### 16.27.2 Member Function Documentation

#### 16.27.2.1 **OGRDataSource** \* **OGRSFDriver::CreateDataSource** (const char \* *pszName*, char \*\* *papszOptions* = NULL) [virtual]

This method attempts to create a new data source based on the passed driver. The *papszOptions* argument can be used to control driver specific creation options. These options are normally documented in the format specific documentation.

This method is the same as the C function **OGR\_Dr\_CreateDataSource**() (p. 325).

#### Note:

This method does **NOT** attach driver instance to the returned data source, so caller should expect that **OGRDataSource::GetDriver**() (p. 92) will return NULL pointer. In order to attach driver to the returned data source, it is required to use C function **OGR\_Dr\_CreateDataSource**. This behavior is related to fix of issue reported in `Ticket #1233`.

#### Parameters:

*pszName* the name for the new data source.

*papszOptions* a StringList of name=value options. Options are driver specific, and driver information can be found at the following url: [http://www.gdal.org/ogr/ogr\\_formats.html](http://www.gdal.org/ogr/ogr_formats.html)

#### Returns:

NULL is returned on failure, or a new **OGRDataSource** (p. 90) on success.

Referenced by **OGR\_Dr\_CreateDataSource**()

### 16.27.2.2 OGRErr OGRSFDriver::DeleteDataSource (const char \* *pszDataSource*) [virtual]

Destroy a datasource.

Destroy the named datasource. Normally it would be safest if the datasource was not open at the time.

Whether this is a supported operation on this driver case be tested using **TestCapability()** (p. 213) on ODrCDeleteDataSource.

This method is the same as the C function OGR\_Dr\_DeleteDataSource().

#### Parameters:

*pszDataSource* the name of the datasource to delete.

#### Returns:

OGRERR\_NONE on success, and OGRERR\_UNSUPPORTED\_OPERATION if this is not supported by this driver.

### 16.27.2.3 const char \* OGRSFDriver::GetName () [pure virtual]

Fetch name of driver (file format). This name should be relatively short (10-40 characters), and should reflect the underlying file format. For instance "ESRI Shapefile".

This method is the same as the C function **OGR\_Dr\_GetName()** (p. 326).

#### Returns:

driver name. This is an internal string and should not be modified or freed.

Referenced by OGRSFDriverRegistrar::Open().

### 16.27.2.4 OGRDataSource \* OGRSFDriver::Open (const char \* *pszName*, int *bUpdate* = FALSE) [pure virtual]

Attempt to open file with this driver.

This method is what **OGRSFDriverRegistrar** (p. 214) uses to implement its **Open()** (p. 212) method. See it for more details.

This method is the same as the C function **OGR\_Dr\_Open()** (p. 326).

#### Parameters:

*pszName* the name of the file, or data source to try and open.

*bUpdate* TRUE if update access is required, otherwise FALSE (the default).

#### Returns:

NULL on error or if the pass name is not supported by this driver, otherwise a pointer to an **OGRDataSource** (p. 90). This **OGRDataSource** (p. 90) should be closed by deleting the object when it is no longer needed.

Referenced by OGRSFDriverRegistrar::Open().

---

**16.27.2.5 int OGRSFDriver::TestCapability (const char \* *pszCapability*)** [pure virtual]

Test if capability is available.

One of the following data source capability names can be passed into this method, and a TRUE or FALSE value will be returned indicating whether or not the capability is available for this object.

- **ODrCCreateDataSource**: True if this driver can support creating data sources.
- **ODrCDeleteDataSource**: True if this driver supports deleting data sources.

The define macro forms of the capability names should be used in preference to the strings themselves to avoid misspelling.

This method is the same as the C function **OGR\_Dr\_TestCapability()** (p. 326).

**Parameters:**

*pszCapability* the capability to test.

**Returns:**

TRUE if capability available otherwise FALSE.

The documentation for this class was generated from the following files:

- **ogrsf\_frmts.h**
- **ogrsf\_frmts.dox**
- **ogrsfdriver.cpp**

## 16.28 OGRSFDriverRegistrar Class Reference

```
#include <ogr_sfrmts.h>
```

### Public Member Functions

- void **RegisterDriver** (OGRSFDriver \*poDriver)
- int **GetDriverCount** (void)
- OGRSFDriver \* **GetDriver** (int iDriver)
- void **AutoLoadDrivers** ()

### Static Public Member Functions

- static OGRSFDriverRegistrar \* **GetRegistrar** ()
- static OGRDataSource \* **Open** (const char \*pszName, int bUpdate=FALSE, OGRSFDriver \*\*ppoDriver=NULL)

### 16.28.1 Detailed Description

Singleton manager for drivers.

### 16.28.2 Member Function Documentation

#### 16.28.2.1 void OGRSFDriverRegistrar::AutoLoadDrivers ()

Auto-load GDAL drivers from shared libraries.

This function will automatically load drivers from shared libraries. It searches the "driver path" for .so (or .dll) files that start with the prefix "gdal\_X.so". It then tries to load them and then tries to call a function within them called GDALRegister\_X() where the 'X' is the same as the remainder of the shared library basename, or failing that to call GDALRegisterMe().

There are a few rules for the driver path. If the GDAL\_DRIVER\_PATH environment variable is set, it is taken to be a list of directories to search separated by colons on unix, or semi-colons on Windows. Otherwise the /usr/local/lib/gdalplugins directory, and (if known) the lib/gdalplugins subdirectory of the gdal home directory are searched.

References CPLFormFilename(), CPLGetBasename(), CPLGetDirname(), CPLGetExecPath(), CPLGetExtension(), and CPLGetSymbol().

Referenced by OGRRegisterAll().

#### 16.28.2.2 OGRSFDriver \* OGRSFDriverRegistrar::GetDriver (int iDriver)

Fetch the indicated driver.

This method is the same as the C function **OGRGetDriver()** (p. 381).

#### Parameters:

*iDriver* the driver index, from 0 to **GetDriverCount()** (p. 215)-1.

**Returns:**

the driver, or NULL if iDriver is out of range.

Referenced by OGRGetDriver().

**16.28.2.3 int OGRSFDriverRegistrar::GetDriverCount (void)**

Fetch the number of registered drivers.

This method is the same as the C function **OGRGetDriverCount()** (p. 382).

**Returns:**

the drivers count.

Referenced by OGRGetDriverCount().

**16.28.2.4 OGRSFDriverRegistrar \* OGRSFDriverRegistrar::GetRegistrar () [static]**

Return the driver manager, creating one if none exist.

**Returns:**

the driver manager.

Referenced by OGRRegisterAll(), OGRRegisterDriver(), Open(), and OGRDataSource::Release().

**16.28.2.5 OGRDataSource \* OGRSFDriverRegistrar::Open (const char \* pszName, int bUpdate = FALSE, OGRSFDriver \*\* ppoDriver = NULL) [static]**

Open a file / data source with one of the registered drivers.

This method loops through all the drivers registered with the driver manager trying each until one succeeds with the given data source. This method is static. Applications don't normally need to use any other **OGRSFDriverRegistrar** (p. 214) methods directly, not do they normally need to have a pointer to an **OGRSFDriverRegistrar** (p. 214) instance.

If this method fails, **CPLGetLastErrorMsg()** (p. 287) can be used to check if there is an error message explaining why.

This method is the same as the C function **OGROpen()** (p. 382).

**Parameters:**

*pszName* the name of the file, or data source to open.

*bUpdate* FALSE for read-only access (the default) or TRUE for read-write access.

*ppoDriver* if non-NULL, this argument will be updated with a pointer to the driver which was used to open the data source.

**Returns:**

NULL on error or if the pass name is not supported by this driver, otherwise a pointer to an **OGRDataSource** (p. 90). This **OGRDataSource** (p. 90) should be closed by deleting the object when it is no longer needed.

**Example:**

```
OGRDataSource (p. 90) *poDS;  
  
poDS = OGRSFDriverRegistrar::Open (p. 215) ( "polygon.shp" );  
if( poDS == NULL )  
{  
    return;  
}  
  
... use the data source ...  
  
delete poDS;
```

References     **OGRDataSource::GetDriver()**,     **OGRSFDriver::GetName()**,     **GetRegistrar()**,  
**OGRDataSource::m\_poDriver**,   **nDrivers**,   **OGRSFDriver::Open()**,   **papoDrivers**,   and   **OGRDataSource::Reference()**.

Referenced by **OGROpen()**.

**16.28.2.6 void OGRSFDriverRegistrar::RegisterDriver (OGRSFDriver \* poDriver)**

Add a driver to the list of registered drivers.

If the passed driver is already registered (based on pointer comparison) then the driver isn't registered. New drivers are added at the end of the list of registered drivers.

This method is the same as the C function **OGRRegisterDriver()** (p. 383).

**Parameters:**

*poDriver* the driver to add.

Referenced by **OGRRegisterDriver()**.

The documentation for this class was generated from the following files:

- **ogrsf\_frmts.h**
  - **ogrsf\_frmts.dox**
  - **ogrsfdriverregistrar.cpp**
-

## 16.29 OGRSpatialReference Class Reference

```
#include <ogr_spatialref.h>
```

### Public Member Functions

- **OGRSpatialReference** (const char \*=NULL)
- virtual **~OGRSpatialReference** ()
- int **Reference** ()
- int **Dereference** ()
- int **GetReferenceCount** () const
- void **Release** ()
- **OGRSpatialReference \* Clone** () const
- OGRErr **exportToWkt** (char \*\*) const
- OGRErr **exportToProj4** (char \*\*) const
- OGRErr **exportToPCI** (char \*\*, char \*\*, double \*\*) const
- OGRErr **exportToUSGS** (long \*, long \*, double \*\*, long \*) const
- OGRErr **exportToPanorama** (long \*, long \*, long \*, long \*, double \*) const
- OGRErr **exportToERM** (char \*pszProj, char \*pszDatum, char \*pszUnits)
- OGRErr **importFromWkt** (char \*\*)
- OGRErr **importFromProj4** (const char \*)
- OGRErr **importFromEPSG** (int)
- OGRErr **importFromESRI** (char \*\*)
- OGRErr **importFromPCI** (const char \*, const char \*=NULL, double \*=NULL)
- OGRErr **importFromUSGS** (long, long, double \*, long)
- OGRErr **importFromPanorama** (long, long, long, double \*)
- OGRErr **importFromDict** (const char \*pszDict, const char \*pszCode)
- OGRErr **importFromURN** (const char \*)
- OGRErr **importFromERM** (const char \*pszProj, const char \*pszDatum, const char \*pszUnits)
- OGRErr **importFromUrl** (const char \*)
- OGRErr **morphToESRI** ()
- OGRErr **morphFromESRI** ()
- OGRErr **Validate** ()
- OGRErr **StripCTParms** (OGR\_SRSNode \*=NULL)
- OGRErr **FixupOrdering** ()
- OGRErr **Fixup** ()
- void **SetRoot** (OGR\_SRSNode \*)
- **OGR\_SRSNode \* GetAttrNode** (const char \*)
- const char \* **GetAttrValue** (const char \*, int=0) const
- OGRErr **SetNode** (const char \*, const char \*)
- OGRErr **SetLinearUnitsAndUpdateParameters** (const char \*pszName, double dfInMeters)
- OGRErr **SetLinearUnits** (const char \*pszName, double dfInMeters)
- double **GetLinearUnits** (char \*\*=NULL) const
- OGRErr **SetAngularUnits** (const char \*pszName, double dfInRadians)
- double **GetAngularUnits** (char \*\*=NULL) const
- double **GetPrimeMeridian** (char \*\*=NULL) const
- int **IsGeographic** () const
- int **IsProjected** () const
- int **IsLocal** () const

- `int IsSameGeogCS (const OGRSpatialReference *) const`
  - `int IsSame (const OGRSpatialReference *) const`
  - `void Clear ()`
  - `OGRERR SetLocalCS (const char *)`
  - `OGRERR SetProjCS (const char *)`
  - `OGRERR SetProjection (const char *)`
  - `OGRERR SetGeogCS (const char *pszGeogName, const char *pszDatumName, const char *pszEllipsoidName, double dfSemiMajor, double dfInvFlattening, const char *pszPMName=NULL, double dfPMOffset=0.0, const char *pszUnits=NULL, double dfConvertToRadians=0.0)`
  - `OGRERR SetWellKnownGeogCS (const char *)`
  - `OGRERR CopyGeogCSFrom (const OGRSpatialReference *poSrcSRS)`
  - `OGRERR SetFromUserInput (const char *)`
  - `OGRERR SetTOWGS84 (double, double, double, double=0.0, double=0.0, double=0.0, double=0.0)`
  - `OGRERR GetTOWGS84 (double *padfCoef, int nCoeff=7) const`
  - `double GetSemiMajor (OGRERR *p=NULL) const`
  - `double GetSemiMinor (OGRERR *p=NULL) const`
  - `double GetInvFlattening (OGRERR *p=NULL) const`
  - `OGRERR SetAuthority (const char *pszTargetKey, const char *pszAuthority, int nCode)`
  - `OGRERR AutoIdentifyEPSG ()`
  - `const char * GetAuthorityCode (const char *pszTargetKey) const`
  - `const char * GetAuthorityName (const char *pszTargetKey) const`
  - `const char * GetExtension (const char *pszTargetKey, const char *pszName, const char *pszDefault=NULL) const`
  - `OGRERR SetProjParm (const char *, double)`
  - `double GetProjParm (const char *, double=0.0, OGRERR *p=NULL) const`
  - `OGRERR SetNormProjParm (const char *, double)`
  - `double GetNormProjParm (const char *, double=0.0, OGRERR *p=NULL) const`
  - `OGRERR SetACEA (double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetAE (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetBonne (double dfStdP1, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetCEA (double dfStdP1, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetCS (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetEC (double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetEckert (int nVariation, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetEquiangular (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetGEOS (double dfCentralMeridian, double dfSatelliteHeight, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetGH (double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetGS (double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetGnomonic (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)`
  - `OGRERR SetHOM (double dfCenterLat, double dfCenterLong, double dfAzimuth, double dfRect-ToSkew, double dfScale, double dfFalseEasting, double dfFalseNorthing)`
-

- OGRErr **SetHOM2PNO** (double dfCenterLat, double dfLat1, double dfLong1, double dfLat2, double dfLong2, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetKrovak** (double dfCenterLat, double dfCenterLong, double dfAzimuth, double dfPseudoStdParallelLat, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetLAEA** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetLCC** (double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetLCC1SP** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetLCCB** (double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetMC** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetMercator** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetMollweide** (double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetNZMG** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetOS** (double dfOriginLat, double dfCMeridian, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetOrthographic** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetPolyconic** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetPS** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetRobinson** (double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetSinusoidal** (double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetStereographic** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetSOC** (double dfLatitudeOfOrigin, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetTM** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetTMVariant** (const char \*pszVariantName, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetTMG** (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetTMSO** (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetTPED** (double dfLat1, double dfLong1, double dfLat2, double dfLong2, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetVDG** (double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
  - OGRErr **SetUTM** (int nZone, int bNorth=TRUE)
  - int **GetUTMZone** (int \*pbNorth=NULL) const
  - OGRErr **SetStatePlane** (int nZone, int bNAD83=TRUE, const char \*pszOverrideUnitName=NULL, double dfOverrideUnit=0.0)
-

### 16.29.1 Detailed Description

This class represents an OpenGIS Spatial Reference System, and contains methods for converting between this object organization and well known text (WKT) format. This object is reference counted as one instance of the object is normally shared between many **OGRGeometry** (p. 124) objects.

Normally application code can fetch needed parameter values for this SRS using **GetAttrValue()** (p. 226), but in special cases the underlying parse tree (or **OGR\_SRSNode** (p. 79) objects) can be accessed more directly.

See the `tutorial` for more information on how to use this class.

### 16.29.2 Constructor & Destructor Documentation

#### 16.29.2.1 **OGRSpatialReference::OGRSpatialReference** (const char \* *pszWKT* = NULL)

Constructor.

This constructor takes an optional string argument which if passed should be a WKT representation of an SRS. Passing this is equivalent to not passing it, and then calling **importFromWkt()** (p. 240) with the WKT string.

Note that newly created objects are given a reference count of one.

The C function `OSRNewSpatialReference()` does the same thing as this constructor.

#### Parameters:

*pszWKT* well known text definition to which the object should be initialized, or NULL (the default).

References `importFromWkt()`.

#### 16.29.2.2 **OGRSpatialReference::~~OGRSpatialReference** () [virtual]

**OGRSpatialReference** (p. 217) destructor.

The C function `OSRDestroySpatialReference()` does the same thing as this method.

### 16.29.3 Member Function Documentation

#### 16.29.3.1 **OGRERR** **OGRSpatialReference::AutoIdentifyEPSG** ()

Set EPSG authority info if possible.

This method inspects a WKT definition, and adds EPSG authority nodes where an aspect of the coordinate system can be easily and safely corresponded with an EPSG identifier. In practice, this method will evolve over time. In theory it can add authority nodes for any object (ie. spheroid, datum, GEOGCS, units, and PROJCS) that could have an authority node. Mostly this is useful to inserting appropriate PROJCS codes for common formulations (like UTM n WGS84).

If it success the **OGRSpatialReference** (p. 217) is updated in place, and the method return `OGRERR_NONE`. If the method fails to identify the general coordinate system `OGRERR_UNSUPPORTED_SRS` is returned but no error message is posted via **CPLERROR()** (p. 287).

This method is the same as the C function `OSRAutoIdentifyEPSG()`.

---

**Returns:**

OGRERR\_NONE or OGRERR\_UNSUPPORTED\_SRS.

References GetAuthorityCode(), GetAuthorityName(), GetUTMZone(), IsGeographic(), IsProjected(), and SetAuthority().

**16.29.3.2 void OGRSpatialReference::Clear ()**

Wipe current definition.

Returns **OGRSpatialReference** (p. 217) to a state with no definition, as it exists when first created. It does not affect reference counts.

Referenced by CopyGeogCSFrom(), importFromERM(), importFromPanorama(), importFromPCI(), importFromProj4(), importFromWkt(), SetFromUserInput(), SetGeogCS(), and SetStatePlane().

**16.29.3.3 OGRSpatialReference \* OGRSpatialReference::Clone () const**

Make a duplicate of this **OGRSpatialReference** (p. 217).

This method is the same as the C function OSRClone().

**Returns:**

a new SRS, which becomes the responsibility of the caller.

References OGR\_SRSNode::Clone(), and poRoot.

**16.29.3.4 OGRErr OGRSpatialReference::CopyGeogCSFrom (const OGRSpatialReference \* poSrcSRS)**

Copy GEOGCS from another **OGRSpatialReference** (p. 217).

The GEOGCS information is copied into this **OGRSpatialReference** (p. 217) from another. If this object has a PROJCS root already, the GEOGCS is installed within it, otherwise it is installed as the root.

**Parameters:**

*poSrcSRS* the spatial reference to copy the GEOGCS information from.

**Returns:**

OGRERR\_NONE on success or an error code.

References Clear(), OGR\_SRSNode::Clone(), OGR\_SRSNode::DestroyChild(), OGR\_SRSNode::FindChild(), GetAttrNode(), OGR\_SRSNode::InsertChild(), and SetRoot().

Referenced by importFromERM(), importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and SetWellKnownGeogCS().

**16.29.3.5 int OGRSpatialReference::Dereference ()**

Decrements the reference count by one.

The method does the same thing as the C function OSRDereference().

---

**Returns:**

the updated reference count.

Referenced by Release().

### 16.29.3.6 OGRErr OGRSpatialReference::exportToERM (char \* *pszProj*, char \* *pszDatum*, char \* *pszUnits*)

Convert coordinate system to ERMapper format.

**Parameters:**

*pszProj* 32 character buffer to receive projection name.

*pszDatum* 32 character buffer to receive datum name.

*pszUnits* 32 character buffer to receive units name.

**Returns:**

OGRErr\_NONE on success, OGRErr\_SRS\_UNSUPPORTED if not translation is found, or OGRErr\_FAILURE on other failures.

References GetAttrValue(), GetAuthorityCode(), GetAuthorityName(), GetLinearUnits(), GetUTMZone(), importFromDict(), IsGeographic(), and IsProjected().

### 16.29.3.7 OGRErr OGRSpatialReference::exportToPanorama (long \* *piProjSys*, long \* *piDatum*, long \* *piEllips*, long \* *piZone*, double \* *padfPrjParams*) const

Export coordinate system in "Panorama" GIS projection definition.

This method is the equivalent of the C function OSRExportToPanorama().

**Parameters:**

*piProjSys* Pointer to variable, where the projection system code will be returned.

*piDatum* Pointer to variable, where the coordinate system code will be returned.

*piEllips* Pointer to variable, where the spheroid code will be returned.

*piZone* Pointer to variable, where the zone for PAN\_PROJ\_UTM projection system will be returned.

*padfPrjParams* an existing 7 double buffer into which the projection parameters will be placed. See **importFromPanorama()** (p. 233) for the list of parameters.

**Returns:**

OGRErr\_NONE on success or an error code on failure.

References GetAttrValue(), GetInvFlattening(), GetNormProjParm(), GetSemiMajor(), GetUTMZone(), and IsLocal().

### 16.29.3.8 OGRErr OGRSpatialReference::exportToPCI (char \*\* *ppszProj*, char \*\* *ppszUnits*, double \*\* *ppadfPrjParams*) const

Export coordinate system in PCI projection definition.

Converts the loaded coordinate reference system into PCI projection definition to the extent possible. The strings returned in *ppszProj*, *ppszUnits* and *ppadfPrjParams* array should be deallocated by the caller with `CPLFree()` when no longer needed.

LOCAL\_CS coordinate systems are not translatable. An empty string will be returned along with `OGRERR_NONE`.

This method is the equivalent of the C function `OSRExportToPCI()`.

#### Parameters:

- ppszProj* pointer to which dynamically allocated PCI projection definition will be assigned.
- ppszUnits* pointer to which dynamically allocated units definition will be assigned.
- ppadfPrjParams* pointer to which dynamically allocated array of 17 projection parameters will be assigned. See **importFromPCI()** (p. 235) for the list of parameters.

#### Returns:

`OGRERR_NONE` on success or an error code on failure.

References `GetAttrNode()`, `GetAttrValue()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, `GetInvFlattening()`, `GetLinearUnits()`, `GetNormProjParm()`, `GetSemiMajor()`, `GetUTMZone()`, `OGR_SRSNode::GetValue()`, and `IsLocal()`.

#### 16.29.3.9 OGRErr OGRSpatialReference::exportToProj4 (char \*\* *ppszProj4*) const

Export coordinate system in PROJ.4 format.

Converts the loaded coordinate reference system into PROJ.4 format to the extent possible. The string returned in *ppszProj4* should be deallocated by the caller with `CPLFree()` when no longer needed.

LOCAL\_CS coordinate systems are not translatable. An empty string will be returned along with `OGRERR_NONE`.

This method is the equivalent of the C function `OSRExportToProj4()`.

#### Parameters:

- ppszProj4* pointer to which dynamically allocated PROJ.4 definition will be assigned.

#### Returns:

`OGRERR_NONE` on success or an error code on failure.

References `CPLAtof()`, `GetAttrNode()`, `GetAttrValue()`, `GetAuthorityCode()`, `GetAuthorityName()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, `GetExtension()`, `GetInvFlattening()`, `GetLinearUnits()`, `GetNormProjParm()`, `GetSemiMajor()`, `GetSemiMinor()`, `GetUTMZone()`, `OGR_SRSNode::GetValue()`, and `IsGeographic()`.

#### 16.29.3.10 OGRErr OGRSpatialReference::exportToUSGS (long \* *piProjSys*, long \* *piZone*, double \*\* *ppadfPrjParams*, long \* *piDatum*) const

Export coordinate system in USGS GCTP projection definition.

This method is the equivalent of the C function `OSRExportToUSGS()`.

---

**Parameters:**

*piProjSys* Pointer to variable, where the projection system code will be returned.

*piZone* Pointer to variable, where the zone for UTM and State Plane projection systems will be returned.

*ppadfPrjParams* Pointer to which dynamically allocated array of 15 projection parameters will be assigned. See **importFromUSGS()** (p. 236) for the list of parameters. Caller responsible to free this array.

**Returns:**

OGRERR\_NONE on success or an error code on failure.

References **GetAttrValue()**, **GetInvFlattening()**, **GetNormProjParm()**, **GetSemiMajor()**, **GetUTMZone()**, and **IsLocal()**.

**16.29.3.11 OGRErr OGRSpatialReference::exportToWkt (char \*\* ppszResult) const**

Convert this SRS into WKT format.

Note that the returned WKT string should be freed with **OGRFree()** or **CPLFree()** when no longer needed. It is the responsibility of the caller.

This method is the same as the C function **OSRExportToWkt()** (p. 395).

**Parameters:**

*ppszResult* the resulting string is returned in this pointer.

**Returns:**

currently OGRERR\_NONE is always returned, but the future it is possible error conditions will develop.

References **OGR\_SRSNode::exportToWkt()**.

**16.29.3.12 OGRErr OGRSpatialReference::Fixup ()**

Fixup as needed.

Some mechanisms to create WKT using **OGRSpatialReference** (p. 217), and some imported WKT, are not valid according to the OGC CT specification. This method attempts to fill in any missing defaults that are required, and fixup ordering problems (using **OSRFixupOrdering()**) so that the resulting WKT is valid.

This method should be expected to evolve over time to as problems are discovered. The following are among the fixup actions this method will take:

- Fixup the ordering of nodes to match the BNF WKT ordering, using the **FixupOrdering()** (p. 225) method.
- Add missing linear or angular units nodes.

This method is the same as the C function **OSRFixup()**.

---

**Returns:**

OGRERR\_NONE on success or an error code if something goes wrong.

References CPLAtof(), OGR\_SRSNode::FindChild(), FixupOrdering(), GetAttrNode(), SetAngularUnits(), and SetLinearUnits().

Referenced by morphToESRI().

**16.29.3.13 OGRERR OGRSpatialReference::FixupOrdering ()**

Correct parameter ordering to match CT Specification.

Some mechanisms to create WKT using **OGRSpatialReference** (p. 217), and some imported WKT fail to maintain the order of parameters required according to the BNF definitions in the OpenGIS SF-SQL and CT Specifications. This method attempts to massage things back into the required order.

This method is the same as the C function OSRFixupOrdering().

**Returns:**

OGRERR\_NONE on success or an error code if something goes wrong.

References OGR\_SRSNode::FixupOrdering().

Referenced by Fixup(), importFromEPSG(), importFromPanorama(), importFromPCI(), importFromUSGS(), and morphFromESRI().

**16.29.3.14 double OGRSpatialReference::GetAngularUnits (char \*\* *ppszName* = NULL) const**

Fetch angular geographic coordinate system units.

If no units are available, a value of "degree" and SRS\_UA\_DEGREE\_CONV will be assumed. This method only checks directly under the GEOGCS node for units.

This method does the same thing as the C function OSRGetAngularUnits().

**Parameters:**

*ppszName* a pointer to be updated with the pointer to the units name. The returned value remains internal to the **OGRSpatialReference** (p. 217) and shouldn't be freed, or modified. It may be invalidated on the next **OGRSpatialReference** (p. 217) call.

**Returns:**

the value to multiply by angular distances to transform them to radians.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by morphToESRI().

**16.29.3.15 OGR\_SRSNode \* OGRSpatialReference::GetAttrNode (const char \* *pszNodePath*)**

Find named node in tree.

---

This method does a pre-order traversal of the node tree searching for a node with this exact value (case insensitive), and returns it. Leaf nodes are not considered, under the assumption that they are just attribute value nodes.

If a node appears more than once in the tree (such as UNIT for instance), the first encountered will be returned. Use `GetNode()` on a subtree to be more specific.

**Parameters:**

*pszNodePath* the name of the node to search for. May contain multiple components such as "GEOGCS|UNITS".

**Returns:**

a pointer to the node found, or NULL if none.

References `OGR_SRSNode::GetNode()`.

Referenced by `CopyGeogCSFrom()`, `exportToPCI()`, `exportToProj4()`, `Fixup()`, `GetAngularUnits()`, `GetAttrValue()`, `GetInvFlattening()`, `GetLinearUnits()`, `GetPrimeMeridian()`, `GetProjParm()`, `GetSemiMajor()`, `GetTOWGS84()`, `importFromESRI()`, `importFromProj4()`, `IsSame()`, `morphFromESRI()`, `morphToESRI()`, `SetAngularUnits()`, `SetAuthority()`, `SetGeogCS()`, `SetLinearUnits()`, `SetLinearUnitsAndUpdateParameters()`, `SetLocalCS()`, `SetProjCS()`, `SetProjection()`, `SetProjParm()`, `SetStatePlane()`, and `SetTOWGS84()`.

### 16.29.3.16 `const char * OGRSpatialReference::GetAttrValue (const char * pszNodeName, int iAttr = 0) const`

Fetch indicated attribute of named node.

This method uses `GetAttrNode()` (p. 225) to find the named node, and then extracts the value of the indicated child. Thus a call to `GetAttrValue("UNIT",1)` would return the second child of the UNIT node, which is normally the length of the linear unit in meters.

This method does the same thing as the C function `OSRGetAttrValue()`.

**Parameters:**

*pszNodeName* the tree node to look for (case insensitive).

*iAttr* the child of the node to fetch (zero based).

**Returns:**

the requested value, or NULL if it fails for any reason.

References `GetAttrNode()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, and `OGR_SRSNode::GetValue()`.

Referenced by `exportToERM()`, `exportToPanorama()`, `exportToPCI()`, `exportToProj4()`, `exportToUSGS()`, `GetUTMZone()`, `IsSame()`, `IsSameGeogCS()`, `morphFromESRI()`, `morphToESRI()`, and `SetUTM()`.

### 16.29.3.17 `const char * OGRSpatialReference::GetAuthorityCode (const char * pszTargetKey) const`

Get the authority code for a node.

---

This method is used to query an AUTHORITY[] node from within the WKT tree, and fetch the code value. While in theory values may be non-numeric, for the EPSG authority all code values should be integral. This method is the same as the C function OSRGetAuthorityCode().

**Parameters:**

*pszTargetKey* the partial or complete path to the node to get an authority from. ie. "PROJCS", "GEOGCS", "GEOGCS|UNIT" or NULL to search for an authority node on the root element.

**Returns:**

value code from authority node, or NULL on failure. The value returned is internal and should not be freed or modified.

References OGR\_SRSNode::FindChild(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by AutoIdentifyEPSG(), exportToERM(), exportToProj4(), and morphToESRI().

### 16.29.3.18 const char \* OGRSpatialReference::GetAuthorityName (const char \* *pszTargetKey*) const

Get the authority name for a node.

This method is used to query an AUTHORITY[] node from within the WKT tree, and fetch the authority name value.

The most common authority is "EPSG".

This method is the same as the C function OSRGetAuthorityName().

**Parameters:**

*pszTargetKey* the partial or complete path to the node to get an authority from. ie. "PROJCS", "GEOGCS", "GEOGCS|UNIT" or NULL to search for an authority node on the root element.

**Returns:**

value code from authority node, or NULL on failure. The value returned is internal and should not be freed or modified.

References OGR\_SRSNode::FindChild(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by AutoIdentifyEPSG(), exportToERM(), exportToProj4(), importFromEPSG(), and morphToESRI().

### 16.29.3.19 const char \* OGRSpatialReference::GetExtension (const char \* *pszTargetKey*, const char \* *pszName*, const char \* *pszDefault* = NULL) const

Fetch extension value.

Fetch the value of the named EXTENSION item for the identified target node.

**Parameters:**

*pszTargetKey* the name or path to the parent node of the EXTENSION.

*pszName* the name of the extension being fetched.

*pszDefault* the value to return if the extension is not found.

**Returns:**

node value if successful or pszDefault on failure.

References OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by exportToProj4().

### 16.29.3.20 double OGRSpatialReference::GetInvFlattening (OGRERR \*pnErr = NULL) const

Get spheroid inverse flattening.

This method does the same thing as the C function OSRGetInvFlattening().

**Parameters:**

*pnErr* if non-NULL set to OGRERR\_FAILURE if no inverse flattening can be found.

**Returns:**

inverse flattening, or SRS\_WGS84\_INVFLATTENING if it can't be found.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by exportToPanorama(), exportToPCI(), exportToProj4(), exportToUSGS(), and GetSemiMinor().

### 16.29.3.21 double OGRSpatialReference::GetLinearUnits (char \*\*ppszName = NULL) const

Fetch linear projection units.

If no units are available, a value of "Meters" and 1.0 will be assumed. This method only checks directly under the PROJCS or LOCAL\_CS node for units.

This method does the same thing as the C function OSRGetLinearUnits().

**Parameters:**

*ppszName* a pointer to be updated with the pointer to the units name. The returned value remains internal to the **OGRSpatialReference** (p. 217) and shouldn't be freed, or modified. It may be invalidated on the next **OGRSpatialReference** (p. 217) call.

**Returns:**

the value to multiply by linear distances to transform them to meters.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by exportToERM(), exportToPCI(), exportToProj4(), importFromESRI(), importFromProj4(), IsSame(), morphToESRI(), SetLinearUnitsAndUpdateParameters(), and SetStatePlane().

### 16.29.3.22 **double OGRSpatialReference::GetNormProjParm (const char \* *pszName*, double *dfDefaultValue* = 0.0, OGRErr \* *pnErr* = NULL) const**

Fetch a normalized projection parameter value.

This method is the same as **GetProjParm()** (p. 229) except that the value of the parameter is "normalized" into degrees or meters depending on whether it is linear or angular.

This method is the same as the C function `OSRGetNormProjParm()`.

#### Parameters:

*pszName* the name of the parameter to fetch, from the set of SRS\_PP codes in **ogr\_srs\_api.h** (p. 392).

*dfDefaultValue* the value to return if this parameter doesn't exist.

*pnErr* place to put error code on failure. Ignored if NULL.

#### Returns:

value of parameter.

References `GetProjParm()`.

Referenced by `exportToPanorama()`, `exportToPCI()`, `exportToProj4()`, `exportToUSGS()`, `GetUTMZone()`, and `SetStatePlane()`.

### 16.29.3.23 **double OGRSpatialReference::GetPrimeMeridian (char \*\* *ppszName* = NULL) const**

Fetch prime meridian info.

Returns the offset of the prime meridian from greenwich in degrees, and the prime meridian name (if requested). If no PRIMEM value exists in the coordinate system definition a value of "Greenwich" and an offset of 0.0 is assumed.

If the prime meridian name is returned, the pointer is to an internal copy of the name. It should not be freed, altered or depended on after the next OGR call.

This method is the same as the C function `OSRGetPrimeMeridian()`.

#### Parameters:

*ppszName* return location for prime meridian name. If NULL, name is not returned.

#### Returns:

the offset to the GEOGCS prime meridian from greenwich in decimal degrees.

References `CPLAtof()`, `GetAttrNode()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, and `OGR_SRSNode::GetValue()`.

### 16.29.3.24 **double OGRSpatialReference::GetProjParm (const char \* *pszName*, double *dfDefaultValue* = 0.0, OGRErr \* *pnErr* = NULL) const**

Fetch a projection parameter value.

NOTE: This code should be modified to translate non degree angles into degrees based on the GEOGCS unit. This has not yet been done.

This method is the same as the C function `OSRGetProjParm()`.

---

**Parameters:**

*pszName* the name of the parameter to fetch, from the set of SRS\_PP codes in **ogr\_srs\_api.h** (p. 392).

*dfDefaultValue* the value to return if this parameter doesn't exist.

*pnErr* place to put error code on failure. Ignored if NULL.

**Returns:**

value of parameter.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), and OGR\_SRSNode::GetValue().

Referenced by GetNormProjParm(), GetUTMZone(), importFromProj4(), IsSame(), morphFromESRI(), morphToESRI(), and SetLinearUnitsAndUpdateParameters().

**16.29.3.25 int OGRSpatialReference::GetReferenceCount () const [inline]**

Fetch current reference count.

**Returns:**

the current reference count.

**16.29.3.26 double OGRSpatialReference::GetSemiMajor (OGRERR \*pnErr = NULL) const**

Get spheroid semi major axis.

This method does the same thing as the C function OSRGetSemiMajor().

**Parameters:**

*pnErr* if non-NULL set to OGRERR\_FAILURE if semi major axis can be found.

**Returns:**

semi-major axis, or SRS\_WGS84\_SEMIMAJOR if it can't be found.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

Referenced by exportToPanorama(), exportToPCI(), exportToProj4(), exportToUSGS(), and GetSemiMinor().

**16.29.3.27 double OGRSpatialReference::GetSemiMinor (OGRERR \*pnErr = NULL) const**

Get spheroid semi minor axis.

This method does the same thing as the C function OSRGetSemiMinor().

**Parameters:**

*pnErr* if non-NULL set to OGRERR\_FAILURE if semi minor axis can be found.

**Returns:**

semi-minor axis, or WGS84 semi minor if it can't be found.

References GetInvFlattening(), and GetSemiMajor().

Referenced by exportToProj4().

### 16.29.3.28 OGRErr OGRSpatialReference::GetTOWGS84 (double \* *padfCoeff*, int *nCoeffCount* = 7) const

Fetch TOWGS84 parameters, if available.

#### Parameters:

*padfCoeff* array into which up to 7 coefficients are placed.

*nCoeffCount* size of padfCoeff - defaults to 7.

#### Returns:

OGRErr\_NONE on success, or OGRErr\_FAILURE if there is no TOWGS84 node available.

References CPLAtof(), GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::GetValue().

### 16.29.3.29 int OGRSpatialReference::GetUTMZone (int \* *pbNorth* = NULL) const

Get utm zone information.

This is the same as the C function OSRGetUTMZone().

#### Parameters:

*pbNorth* pointer to in to set to TRUE if northern hemisphere, or FALSE if southern.

#### Returns:

UTM zone number or zero if this isn't a UTM definition.

References GetAttrValue(), GetNormProjParm(), and GetProjParm().

Referenced by AutoIdentifyEPSG(), exportToERM(), exportToPanorama(), exportToPCI(), exportToProj4(), exportToUSGS(), and morphToESRI().

### 16.29.3.30 OGRErr OGRSpatialReference::importFromDict (const char \* *pszDictFile*, const char \* *pszCode*)

Read SRS from WKT dictionary.

This method will attempt to find the indicated coordinate system identity in the indicated dictionary file. If found, the WKT representation is imported and used to initialize this **OGRSpatialReference** (p. 217).

More complete information on the format of the dictionary files can be found in the epsg.wkt file in the GDAL data tree. The dictionary files are searched for in the "GDAL" domain using CPLFindFile(). Normally this results in searching /usr/local/share/gdal or somewhere similar.

This method is the same as the C function OSRImportFromDict().

#### Parameters:

*pszDictFile* the name of the dictionary file to load.

*pszCode* the code to lookup in the dictionary.

**Returns:**

OGRERR\_NONE on success, or OGRERR\_SRS\_UNSUPPORTED if the code isn't found, and OGRERR\_SRS\_FAILURE if something more dramatic goes wrong.

References importFromWkt().

Referenced by exportToERM(), importFromEPSG(), importFromERM(), and SetFromUserInput().

### 16.29.3.31 OGRErr OGRSpatialReference::importFromEPSG (int *nCode*)

Initialize SRS based on EPSG GCS or PCS code.

This code uses the GeoTIFF cpl\_csv services to access the EPSG CSV data. If frmts/gtiff/libgeotiff isn't linked in, linking will fail. If EPSG tables can't be found at runtime, the method will fail.

This method is the same as the C function OSRImportFromEPSG().

**Parameters:**

*nCode* a GCS or PCS code from the horizontal coordinate system table.

**Returns:**

OGRERR\_NONE on success, or an error code on failure.

References FixupOrdering(), GetAuthorityName(), importFromDict(), importFromProj4(), IsGeographic(), IsProjected(), and SetAuthority().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), importFromURN(), SetFromUserInput(), SetStatePlane(), and SetWellKnownGeogCS().

### 16.29.3.32 OGRErr OGRSpatialReference::importFromERM (const char \* *pszProj*, const char \* *pszDatum*, const char \* *pszUnits*)

OGR WKT from ERMMapper projection definitions.

Generates an **OGRSpatialReference** (p. 217) definition from an ERMMapper datum and projection name. Based on the ecw\_cs.wkt dictionary file from gdal/data.

**Parameters:**

*pszProj* the projection name, such as "NUTM11" or "GEOGRAPHIC".

*pszDatum* the datum name, such as "NAD83".

*pszUnits* the linear units "FEET" or "METERS".

**Returns:**

OGRERR\_NONE on success or OGRERR\_UNSUPPORTED\_SRS if not found.

References Clear(), CopyGeogCSFrom(), importFromDict(), IsLocal(), and SetLinearUnits().

**16.29.3.33 OGRErr OGRSpatialReference::importFromESRI (char \*\* *papszPrj*)**

Import coordinate system from ESRI .prj format(s).

This function will read the text loaded from an ESRI .prj file, and translate it into an **OGRSpatialReference** (p. 217) definition. This should support many (but by no means all) old style (Arc/Info 7.x) .prj files, as well as the newer pseudo-OGC WKT .prj files. Note that new style .prj files are in OGC WKT format, but require some manipulation to correct datum names, and units on some projection parameters. This is addressed within **importFromESRI()** (p. 233) by an automatical call to **morphFromESRI()** (p. 242).

Currently only GEOGRAPHIC, UTM, STATEPLANE, GREATBRITIAN\_GRID, ALBERS, EQUIDISTANT\_CONIC, and TRANSVERSE (mercator) projections are supported from old style files.

At this time there is no equivalent exportToESRI() method. Writing old style .prj files is not supported by **OGRSpatialReference** (p. 217). However the **morphToESRI()** (p. 243) and **exportToWkt()** (p. 224) methods can be used to generate output suitable to write to new style (Arc 8) .prj files.

This function is the equivalent of the C function OSRImportFromESRI().

**Parameters:**

*papszPrj* NULL terminated list of strings containing the definition.

**Returns:**

OGRErr\_NONE on success or an error code in case of failure.

References CopyGeogCSFrom(), OGR\_SRSNode::DestroyChild(), GetAttrNode(), GetLinearUnits(), importFromEPSG(), importFromWkt(), IsLocal(), IsProjected(), morphFromESRI(), SetACEA(), SetEC(), SetLCC(), SetLinearUnitsAndUpdateParameters(), SetLocalCS(), SetPS(), SetStatePlane(), SetTM(), SetUTM(), and SetWellKnownGeogCS().

**16.29.3.34 OGRErr OGRSpatialReference::importFromPanorama (long *iProjSys*, long *iDatum*, long *iEllips*, double \* *padfPrjParams*)**

Import coordinate system from "Panorama" GIS projection definition.

This method will import projection definition in style, used by "Panorama" GIS.

This function is the equivalent of the C function OSRImportFromPanorama().

**Parameters:**

*iProjSys* Input projection system code, used in GIS "Panorama".

**Supported Projections**

- 1: Gauss-Kruger (Transverse Mercator)
  - 4: Lambert Azimuthal Equal Area
  - 5: Stereographic
  - 6: Azimuthal Equidistant (Postel)
  - 8: Mercator
  - 11: Polyconic
  - 13: Polar Stereographic
  - 15: Gnomonic
  - 17: Universal Transverse Mercator (PAN\_PROJ\_UTM)
-

```
19: Mollweide
20: Equidistant Conic
```

**Parameters:**

*iDatum* Input coordinate system.

**Supported Datums**

```
1: Pulkovo, 1942
2: WGS, 1984
```

**Parameters:**

*iEllips* Input spheroid.

**Supported Spheroids**

```
1: Krassovsky, 1940
2: WGS, 1972
3: International, 1924 (Hayford, 1909)
4: Clarke, 1880
5: Clarke, 1866 (NAD1927)
6: Everest, 1830
7: Bessel, 1841
8: Airy, 1830
9: WGS, 1984 (GPS)
```

**Parameters:**

*pdfPrjParams* Array of 7 coordinate system parameters:

```
[0] Latitude of the first standard parallel (radians)
[1] Latitude of the second standard parallel (radians)
[2] Latitude of center of projection (radians)
[3] Longitude of center of projection (radians)
[4] Scaling factor
[5] False Easting
[6] False Northing
```

Particular projection uses different parameters, unused ones may be set to zero. If NULL supplied instead of array pointer default values will be used (i.e., zeroes).

**Returns:**

OGRERR\_NONE on success or an error code in case of failure.

References Clear(), CopyGeogCSFrom(), FixupOrdering(), importFromEPSG(), IsLocal(), IsProjected(), SetAE(), SetAuthority(), SetEC(), SetGeogCS(), SetGnomonic(), SetLAEA(), SetLCC(), SetLinearUnits(), SetLocalCS(), SetMercator(), SetMollweide(), SetPolyconic(), SetPS(), SetStereographic(), SetTM(), SetUTM(), and SetWellKnownGeogCS().

---

### 16.29.3.35 OGRErr OGRSpatialReference::importFromPCI (const char \* *pszProj*, const char \* *pszUnits* = NULL, double \* *padfPrjParams* = NULL)

Import coordinate system from PCI projection definition.

PCI software uses 16-character string to specify coordinate system and datum/ellipsoid. You should supply at least this string to the **importFromPCI()** (p. 235) function.

This function is the equivalent of the C function OSRImportFromPCI().

#### Parameters:

*pszProj* NULL terminated string containing the definition. Looks like "pppppppppppp Ennn" or "pppppppppppp Dnnn", where "pppppppppppp" is a projection code, "Ennn" is an ellipsoid code, "Dnnn" — a datum code.

*pszUnits* Grid units code ("DEGREE" or "METRE"). If NULL "METRE" will be used.

*padfPrjParams* Array of 16 coordinate system parameters:

[0] Spheroid semi major axis [1] Spheroid semi minor axis [2] Reference Longitude [3] Reference Latitude [4] First Standard Parallel [5] Second Standard Parallel [6] False Easting [7] False Northing [8] Scale Factor [9] Height above sphere surface [10] Longitude of 1st point on center line [11] Latitude of 1st point on center line [12] Longitude of 2nd point on center line [13] Latitude of 2nd point on center line [14] Azimuth east of north for center line [15] Landsat satellite number [16] Landsat path number

Particular projection uses different parameters, unused ones may be set to zero. If NULL supplied instead of array pointer default values will be used (i.e., zeroes).

#### Returns:

OGRErr\_NONE on success or an error code in case of failure.

References Clear(), CopyGeogCSFrom(), FixupOrdering(), importFromEPSG(), IsGeographic(), IsLocal(), IsProjected(), SetACEA(), SetAE(), SetAngularUnits(), SetAuthority(), SetEC(), SetEquirectangular(), SetGeogCS(), SetGnomonic(), SetLAEA(), SetLCC(), SetLinearUnits(), SetLocalCS(), SetMC(), SetMercator(), SetOrthographic(), SetPolyconic(), SetPS(), SetRobinson(), SetSinusoidal(), SetStatePlane(), SetStereographic(), SetTM(), SetUTM(), SetVDG(), and SetWellKnownGeogCS().

### 16.29.3.36 OGRErr OGRSpatialReference::importFromProj4 (const char \* *pszProj4*)

Import PROJ.4 coordinate string.

The **OGRSpatialReference** (p. 217) is initialized from the passed PROJ.4 style coordinate system string. In addition to many +proj formulations which have OGC equivalents, it is also possible to import "+init=epsg:n" style definitions. These are passed to **importFromEPSG()** (p. 232). Other init strings (such as the state plane zones) are not currently supported.

Example: *pszProj4* = "+proj=utm +zone=11 +datum=WGS84"

This method is the equivalent of the C function OSRImportFromProj4().

#### Parameters:

*pszProj4* the PROJ.4 style string.

#### Returns:

OGRErr\_NONE on success or OGRErr\_CORRUPT\_DATA on failure.

References `Clear()`, `CopyGeogCSFrom()`, `CPLAtof()`, `CPLAtofM()`, `GetAttrNode()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, `GetLinearUnits()`, `GetProjParm()`, `OGR_SRSNode::GetValue()`, `importFromEPSG()`, `IsLocal()`, `IsProjected()`, `SetACEA()`, `SetAE()`, `SetBonne()`, `SetCEA()`, `SetCS()`, `SetEC()`, `SetEquirectangular()`, `SetGeogCS()`, `SetGEOS()`, `SetGH()`, `SetGnomonic()`, `SetGS()`, `SetHOM()`, `SetKrovak()`, `SetLAEA()`, `SetLCC()`, `SetLCC1SP()`, `SetLinearUnits()`, `SetMC()`, `SetMercator()`, `SetMollweide()`, `SetNormProjParm()`, `SetNZMG()`, `SetOrthographic()`, `SetOS()`, `SetPolyconic()`, `SetPS()`, `SetRobinson()`, `SetSinusoidal()`, `SetStereographic()`, `SetTM()`, `SetTOWGS84()`, `SetTPED()`, `SetUTM()`, `SetVDG()`, and `SetWellKnownGeogCS()`.

Referenced by `importFromEPSG()`, and `SetFromUserInput()`.

### 16.29.3.37 OGRErr OGRSpatialReference::importFromUrl (const char \* *pszUrl*)

Set spatial reference from a URL.

This method will download the spatial reference at a given URL and feed it into `SetFromUserInput` for you.

This method does the same thing as the `OSRImportFromUrl()` function.

#### Parameters:

*pszDefinition* text definition to try to deduce SRS from.

#### Returns:

`OGRErr_NONE` on success, or an error code with the curl error message if it is unable to download data.

References `SetFromUserInput()`.

Referenced by `SetFromUserInput()`.

### 16.29.3.38 OGRErr OGRSpatialReference::importFromURN (const char \* *pszURN*)

Initialize from OGC URN.

Initializes this spatial reference from a coordinate system defined by an OGC URN prefixed with "urn:ogc:def:crs:" per recommendation paper 06-023r1. Currently EPSG and OGC authority values are supported, including OGC auto codes, but not including CRS1 or CRS88 (NAVD88).

This method is also support through `SetFromUserInput()` (p. 246) which can normally be used for URNs.

#### Parameters:

*pszURN* the urn string.

#### Returns:

`OGRErr_NONE` on success or an error code.

References `importFromEPSG()`, and `SetWellKnownGeogCS()`.

Referenced by `SetFromUserInput()`.

### 16.29.3.39 OGRErr OGRSpatialReference::importFromUSGS (long *iProjSys*, long *iZone*, double \* *padfPrjParams*, long *iDatum*)

Import coordinate system from USGS projection definition.

This method will import projection definition in style, used by USGS GCTP software. GCTP operates on angles in packed DMS format (see **CPLDecToPackedDMS()** (p. 268) function for details), so all angle values (latitudes, longitudes, azimuths, etc.) specified in the `padfPrjParams` array should be in the packed DMS format.

This function is the equivalent of the C function `OSRImportFromUSGS()`.

#### Parameters:

***iProjSys*** Input projection system code, used in GCTP.

***iZone*** Input zone for UTM and State Plane projection systems. For Southern Hemisphere UTM use a negative zone code. `iZone` ignored for all other projections.

***padfPrjParams*** Array of 15 coordinate system parameters. These parameters differs for different projections.

#### Projection Transformation Package Projection Parameters

Code & Projection Id	Array Element							
	0	1	2	3	4	5	6	7
0 Geographic								
1 U T M	Lon/Z	Lat/Z						
2 State Plane								
3 Albers Equal Area	SMajor	SMinor	STDPR1	STDPR2	CentMer	OriginLat	FE	FN
4 Lambert Conformal C	SMajor	SMinor	STDPR1	STDPR2	CentMer	OriginLat	FE	FN
5 Mercator	SMajor	SMinor			CentMer	TrueScale	FE	FN
6 Polar Stereographic	SMajor	SMinor			LongPol	TrueScale	FE	FN
7 Polyconic	SMajor	SMinor			CentMer	OriginLat	FE	FN
8 Equid. Conic A	SMajor	SMinor	STDPAR		CentMer	OriginLat	FE	FN
Equid. Conic B	SMajor	SMinor	STDPR1	STDPR2	CentMer	OriginLat	FE	FN
9 Transverse Mercator	SMajor	SMinor	Factor		CentMer	OriginLat	FE	FN
10 Stereographic	Sphere				CentLon	CenterLat	FE	FN
11 Lambert Azimuthal	Sphere				CentLon	CenterLat	FE	FN
12 Azimuthal	Sphere				CentLon	CenterLat	FE	FN
13 Gnomonic	Sphere				CentLon	CenterLat	FE	FN
14 Orthographic	Sphere				CentLon	CenterLat	FE	FN
15 Gen. Vert. Near Per	Sphere		Height		CentLon	CenterLat	FE	FN
16 Sinusoidal	Sphere				CentMer		FE	FN
17 Equirectangular	Sphere				CentMer	TrueScale	FE	FN
18 Miller Cylindrical	Sphere				CentMer		FE	FN
19 Van der Grinten	Sphere				CentMer	OriginLat	FE	FN
20 Hotin Oblique Merc A	SMajor	SMinor	Factor			OriginLat	FE	FN
Hotin Oblique Merc B	SMajor	SMinor	Factor	AziAng	AzmthPt	OriginLat	FE	FN
21 Robinson	Sphere				CentMer		FE	FN
22 Space Oblique Merc A	SMajor	SMinor		IncAng	AscLong		FE	FN
Space Oblique Merc B	SMajor	SMinor	Satnum	Path			FE	FN
23 Alaska Conformal	SMajor	SMinor					FE	FN
24 Interrupted Goode	Sphere							
25 Mollweide	Sphere				CentMer		FE	FN
26 Interrupt Mollweide	Sphere							
27 Hammer	Sphere				CentMer		FE	FN
28 Wagner IV	Sphere				CentMer		FE	FN
29 Wagner VII	Sphere				CentMer		FE	FN
30 Oblated Equal Area	Sphere		Shapem	Shapen	CentLon	CenterLat	FE	FN

Code & Projection Id	Array Element				
	8	9	10	11	12
0 Geographic					
1 U T M					
2 State Plane					
3 Albers Equal Area					
4 Lambert Conformal C					
5 Mercator					
6 Polar Stereographic					
7 Polyconic					
8 Equid. Conic A	zero				
Equid. Conic B	one				
9 Transverse Mercator					
10 Stereographic					
11 Lambert Azimuthal					
12 Azimuthal					
13 Gnomonic					
14 Orthographic					
15 Gen. Vert. Near Per					
16 Sinusoidal					
17 Equirectangular					
18 Miller Cylindrical					
19 Van der Grinten					
20 Hotin Oblique Merc A	Long1	Lat1	Long2	Lat2	zero
Hotin Oblique Merc B					one
21 Robinson					
22 Space Oblique Merc A	PSRev	LRat	PFlag		zero
Space Oblique Merc B					one
23 Alaska Conformal					
24 Interrupted Goode					
25 Mollweide					
26 Interrupt Mollweide					
27 Hammer					
28 Wagner IV					
29 Wagner VII					
30 Oblated Equal Area	Angle				

where

Lon/Z	Longitude of any point in the UTM zone or zero. If zero, a zone code must be specified.
Lat/Z	Latitude of any point in the UTM zone or zero. If zero, a zone code must be specified.
SMajor	Semi-major axis of ellipsoid. If zero, Clarke 1866 in meters is assumed.
SMinor	Eccentricity squared of the ellipsoid if less than zero, if zero, a spherical form is assumed, or if greater than zero, the semi-minor axis of ellipsoid.
Sphere	Radius of reference sphere. If zero, 6370997 meters is used.
STDPAR	Latitude of the standard parallel
STDPR1	Latitude of the first standard parallel
STDPR2	Latitude of the second standard parallel
CentMer	Longitude of the central meridian
OriginLat	Latitude of the projection origin

FE	False easting in the same units as the semi-major axis
FN	False northing in the same units as the semi-major axis
TrueScale	Latitude of true scale
LongPol	Longitude down below pole of map
Factor	Scale factor at central meridian (Transverse Mercator) or center of projection (Hotine Oblique Mercator)
CentLon	Longitude of center of projection
CenterLat	Latitude of center of projection
Height	Height of perspective point
Long1	Longitude of first point on center line (Hotine Oblique Mercator, format A)
Long2	Longitude of second point on center line (Hotine Oblique Mercator, format A)
Lat1	Latitude of first point on center line (Hotine Oblique Mercator, format A)
Lat2	Latitude of second point on center line (Hotine Oblique Mercator, format A)
AziAng	Azimuth angle east of north of center line (Hotine Oblique Mercator, format B)
AzmthPt	Longitude of point on central meridian where azimuth occurs (Hotine Oblique Mercator, format B)
IncAng	Inclination of orbit at ascending node, counter-clockwise from equator (SOM, format A)
AscLong	Longitude of ascending orbit at equator (SOM, format A)
PSRev	Period of satellite revolution in minutes (SOM, format A)
LRat	Landsat ratio to compensate for confusion at northern end of orbit (SOM, format A -- use 0.5201613)
PFlag	End of path flag for Landsat: 0 = start of path, 1 = end of path (SOM, format A)
Satnum	Landsat Satellite Number (SOM, format B)
Path	Landsat Path Number (Use WRS-1 for Landsat 1, 2 and 3 and WRS-2 for Landsat 4, 5 and 6.) (SOM, format B)
Shapem	Oblated Equal Area oval shape parameter m
Shapen	Oblated Equal Area oval shape parameter n
Angle	Oblated Equal Area oval rotation angle

Array elements 13 and 14 are set to zero. All array elements with blank fields are set to zero too.

### Parameters:

*iDatum* Output spheroid.

If the datum code is negative, the first two values in the parameter array (parm) are used to define the values as follows:

- If padfPrjParams[0] is a non-zero value and padfPrjParams[1] is greater than one, the semimajor axis is set to padfPrjParams[0] and the semiminor axis is set to padfPrjParams[1].
- If padfPrjParams[0] is nonzero and padfPrjParams[1] is greater than zero but less than or equal to one, the semimajor axis is set to padfPrjParams[0] and the semiminor axis is computed from the eccentricity squared value padfPrjParams[1]:  

$$\text{semiminor} = \sqrt{(1.0 - ES) * \text{semimajor}}$$
where  
ES = eccentricity squared

- If `padfPrjParams[0]` is nonzero and `padfPrjParams[1]` is equal to zero, the semimajor axis and semiminor axis are set to `padfPrjParams[0]`.
- If `padfPrjParams[0]` equals zero and `padfPrjParams[1]` is greater than zero, the default Clarke 1866 is used to assign values to the semimajor axis and semiminor axis.
- If `padfPrjParams[0]` and `padfPrjParams[1]` equals zero, the semimajor axis is set to 6370997.0 and the semiminor axis is set to zero.

If a datum code is zero or greater, the semimajor and semiminor axis are defined by the datum code as found in the following table:

### Supported Datums

```

0: Clarke 1866 (default)
1: Clarke 1880
2: Bessel
3: International 1967
4: International 1909
5: WGS 72
6: Everest
7: WGS 66
8: GRS 1980/WGS 84
9: Airy
10: Modified Everest
11: Modified Airy
12: Walbeck
13: Southeast Asia
14: Australian National
15: Krassovsky
16: Hough
17: Mercury 1960
18: Modified Mercury 1968
19: Sphere of Radius 6370997 meters

```

### Returns:

`OGRERR_NONE` on success or an error code in case of failure.

References `FixupOrdering()`, `IsLocal()`, `IsProjected()`, `SetACEA()`, `SetAE()`, `SetAuthority()`, `SetEC()`, `SetEquiarectangular()`, `SetGeogCS()`, `SetGnomonic()`, `SetHOM()`, `SetHOM2PNO()`, `SetLAEA()`, `SetLCC()`, `SetLinearUnits()`, `SetLocalCS()`, `SetMC()`, `SetMercator()`, `SetMollweide()`, `SetOrthographic()`, `SetPolyconic()`, `SetPS()`, `SetRobinson()`, `SetSinusoidal()`, `SetStatePlane()`, `SetStereographic()`, `SetTM()`, `SetUTM()`, `SetVDG()`, and `SetWellKnownGeogCS()`.

#### 16.29.3.40 OGRErr OGRSpatialReference::importFromWkt (char \*\* *ppszInput*)

Import from WKT string.

This method will wipe the existing SRS definition, and reassign it based on the contents of the passed WKT string. Only as much of the input string as needed to construct this SRS is consumed from the input string, and the input string pointer is then updated to point to the remaining (unused) input.

This method is the same as the C function `OSRImportFromWkt()` (p. 395).

**Parameters:**

*ppszInput* Pointer to pointer to input. The pointer is updated to point to remaining unused input text.

**Returns:**

OGRERR\_NONE if import succeeds, or OGRERR\_CORRUPT\_DATA if it fails for any reason.

References Clear(), and OGR\_SRSNode::importFromWkt().

Referenced by importFromDict(), importFromESRI(), OGRSpatialReference(), SetFromUserInput(), and SetWellKnownGeogCS().

**16.29.3.41 int OGRSpatialReference::IsGeographic () const**

Check if geographic coordinate system.

This method is the same as the C function OSRIsGeographic().

**Returns:**

TRUE if this spatial reference is geographic ... that is the root is a GEOGCS node.

Referenced by AutoIdentifyEPSG(), exportToERM(), exportToProj4(), importFromEPSG(), importFromPCI(), and SetWellKnownGeogCS().

**16.29.3.42 int OGRSpatialReference::IsLocal () const**

Check if local coordinate system.

This method is the same as the C function OSRIsLocal().

**Returns:**

TRUE if this spatial reference is local ... that is the root is a LOCAL\_CS node.

Referenced by exportToPanorama(), exportToPCI(), exportToUSGS(), importFromERM(), importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

**16.29.3.43 int OGRSpatialReference::IsProjected () const**

Check if projected coordinate system.

This method is the same as the C function OSRIsProjected().

**Returns:**

TRUE if this contains a PROJCS node indicating a it is a projected coordinate system.

References OGR\_SRSNode::GetValue().

Referenced by AutoIdentifyEPSG(), exportToERM(), importFromEPSG(), importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), importFromUSGS(), and IsSame().

#### 16.29.3.44 `int OGRSpatialReference::IsSame (const OGRSpatialReference * poOtherSRS) const`

These two spatial references describe the same system.

##### Parameters:

*poOtherSRS* the SRS being compared to.

##### Returns:

TRUE if equivalent or FALSE otherwise.

References `GetAttrNode()`, `GetAttrValue()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, `GetLinearUnits()`, `GetProjParm()`, `GetRoot()`, `OGR_SRSNode::GetValue()`, `IsProjected()`, and `IsSameGeogCS()`.

#### 16.29.3.45 `int OGRSpatialReference::IsSameGeogCS (const OGRSpatialReference * poOther) const`

Do the GeogCS'es match?

This method is the same as the C function `OSRIsSameGeogCS()`.

##### Parameters:

*poOther* the SRS being compared against.

##### Returns:

TRUE if they are the same or FALSE otherwise.

References `CPLAtof()`, and `GetAttrValue()`.

Referenced by `IsSame()`.

#### 16.29.3.46 `OGRERR OGRSpatialReference::morphFromESRI ()`

Convert in place to ESRI WKT format.

The value nodes of this coordinate system as modified in various manners more closely map onto the ESRI concept of WKT format. This includes renaming a variety of projections and arguments, and stripping out nodes not recognised by ESRI (like `AUTHORITY` and `AXIS`).

This does the same as the C function `OSRMorphFromESRI()`.

##### Returns:

`OGRERR_NONE` unless something goes badly wrong.

References `OGR_SRSNode::applyRemapper()`, `FixupOrdering()`, `GetAttrNode()`, `GetAttrValue()`, `OGR_SRSNode::GetChild()`, `GetProjParm()`, `OGR_SRSNode::GetValue()`, `SetNode()`, `SetProjParm()`, and `OGR_SRSNode::SetValue()`.

Referenced by `importFromESRI()`, and `SetFromUserInput()`.

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**16.29.3.47 OGRErr OGRSpatialReference::morphToESRI ()**

Convert in place from ESRI WKT format.

The value notes of this coordinate system as modified in various manners to adhere more closely to the WKT standard. This mostly involves translating a variety of ESRI names for projections, arguments and datums to "standard" names, as defined by Adam Gawne-Cain's reference translation of EPSG to WKT for the CT specification.

This does the same as the C function OSRMorphToESRI().

**Returns:**

OGRERR\_NONE unless something goes badly wrong.

References OGR\_SRSNode::applyRemapper(), OGR\_SRSNode::DestroyChild(), Fixup(), GetAngularUnits(), GetAttrNode(), GetAttrValue(), GetAuthorityCode(), GetAuthorityName(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), GetLinearUnits(), GetProjParm(), GetUTMZone(), OGR\_SRSNode::GetValue(), SetNode(), OGR\_SRSNode::SetValue(), and StripCTParms().

**16.29.3.48 int OGRSpatialReference::Reference ()**

Increments the reference count by one.

The reference count is used keep track of the number of **OGRGeometry** (p. 124) objects referencing this SRS.

The method does the same thing as the C function OSRReference().

**Returns:**

the updated reference count.

Referenced by OGRGeometry::assignSpatialReference().

**16.29.3.49 void OGRSpatialReference::Release ()**

Decrements the reference count by one, and destroy if zero.

The method does the same thing as the C function OSRRelease().

References Dereference().

Referenced by OGRGeometry::assignSpatialReference().

**16.29.3.50 OGRErr OGRSpatialReference::SetACEA (double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Albers Conic Equal Area

References SetNormProjParm(), and SetProjection().

Referenced by importFromESRI(), importFromPCI(), importFromProj4(), and importFromUSGS().

---

### 16.29.3.51 OGRErr OGRSpatialReference::SetAE (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

Azimuthal Equidistant

References SetNormProjParm(), and SetProjection().

Referenced by importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

### 16.29.3.52 OGRErr OGRSpatialReference::SetAngularUnits (const char \* *pszUnitsName*, double *dfInRadians*)

Set the angular units for the geographic coordinate system.

This method creates a UNITS subnode with the specified values as a child of the GEOGCS node.

This method does the same as the C function OSRSetAngularUnits().

#### Parameters:

*pszUnitsName* the units name to be used. Some preferred units names can be found in **ogr\_srs\_api.h** (p. 392) such as SRS\_UA\_DEGREE.

*dfInRadians* the value to multiple by an angle in the indicated units to transform to radians. Some standard conversion factors can be found in **ogr\_srs\_api.h** (p. 392).

#### Returns:

OGRERR\_NONE on success.

References OGR\_SRSNode::AddChild(), OGR\_SRSNode::FindChild(), GetAttrNode(), OGR\_SRSNode::GetChild(), and OGR\_SRSNode::SetValue().

Referenced by Fixup(), and importFromPCI().

### 16.29.3.53 OGRErr OGRSpatialReference::SetAuthority (const char \* *pszTargetKey*, const char \* *pszAuthority*, int *nCode*)

Set the authority for a node.

This method is the same as the C function OSRSetAuthority().

#### Parameters:

*pszTargetKey* the partial or complete path to the node to set an authority on. ie. "PROJCS", "GEOGCS" or "GEOGCS|UNIT".

*pszAuthority* authority name, such as "EPSG".

*nCode* code for value with this authority.

#### Returns:

OGRERR\_NONE on success.

References OGR\_SRSNode::AddChild(), OGR\_SRSNode::DestroyChild(), OGR\_SRSNode::FindChild(), and GetAttrNode().

Referenced by AutoIdentifyEPSG(), importFromEPSG(), importFromPanorama(), importFromPCI(), and importFromUSGS().

**16.29.3.54 OGRErr OGRSpatialReference::SetBonne (double *dfStdP1*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Bonne

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

**16.29.3.55 OGRErr OGRSpatialReference::SetCEA (double *dfStdP1*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Cylindrical Equal Area

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

**16.29.3.56 OGRErr OGRSpatialReference::SetCS (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Cassini-Soldner

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

**16.29.3.57 OGRErr OGRSpatialReference::SetEC (double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Equidistant Conic

References SetNormProjParm(), and SetProjection().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

**16.29.3.58 OGRErr OGRSpatialReference::SetEckert (int *nVariation*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Eckert I-VI

References SetNormProjParm(), and SetProjection().

**16.29.3.59 OGRErr OGRSpatialReference::SetEquirectangular (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Equirectangular

References SetNormProjParm(), and SetProjection().

Referenced by importFromPCI(), importFromProj4(), and importFromUSGS().

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### 16.29.3.60 OGRErr OGRSpatialReference::SetFromUserInput (const char \* *pszDefinition*)

Set spatial reference from various text formats.

This method will examine the provided input, and try to deduce the format, and then use it to initialize the spatial reference system. It may take the following forms:

1. Well Known Text definition - passed on to **importFromWkt()** (p. 240).
2. "EPSG:n" - number passed on to **importFromEPSG()** (p. 232).
3. "AUTO:proj\_id,unit\_id,lon0,lat0" - WMS auto projections.
4. "urn:ogc:def:crs:EPSG::n" - ogc urns
5. PROJ.4 definitions - passed on to **importFromProj4()** (p. 235).
6. filename - file read for WKT, XML or PROJ.4 definition.
7. well known name accepted by **SetWellKnownGeogCS()** (p. 258), such as NAD27, NAD83, WGS84 or WGS72.
8. WKT (directly or in a file) in ESRI format should be prefixed with ESRI:: to trigger an automatic **morphFromESRI()** (p. 242).

It is expected that this method will be extended in the future to support XML and perhaps a simplified "minilanguage" for indicating common UTM and State Plane definitions.

This method is intended to be flexible, but by its nature it is imprecise as it must guess information about the format intended. When possible applications should call the specific method appropriate if the input is known to be in a particular format.

This method does the same thing as the OSRSetFromUserInput() function.

#### Parameters:

*pszDefinition* text definition to try to deduce SRS from.

#### Returns:

OGRErr\_NONE on success, or an error code if the name isn't recognised, the definition is corrupt, or an EPSG value can't be successfully looked up.

References Clear(), importFromDict(), importFromEPSG(), importFromProj4(), importFromUrl(), importFromURN(), importFromWkt(), morphFromESRI(), and SetWellKnownGeogCS().

Referenced by importFromUrl().

### 16.29.3.61 OGRErr OGRSpatialReference::SetGeogCS (const char \* *pszGeogName*, const char \* *pszDatumName*, const char \* *pszSpheroidName*, double *dfSemiMajor*, double *dfInvFlattening*, const char \* *pszPMName* = NULL, double *dfPMOffset* = 0.0, const char \* *pszAngularUnits* = NULL, double *dfConvertToRadians* = 0.0)

Set geographic coordinate system.

This method is used to set the datum, ellipsoid, prime meridian and angular units for a geographic coordinate system. It can be used on its own to establish a geographic spatial reference, or applied to a projected coordinate system to establish the underlying geographic coordinate system.

This method does the same as the C function OSRSetGeogCS().

**Parameters:**

*pszGeogName* user visible name for the geographic coordinate system (not to serve as a key).

*pszDatumName* key name for this datum. The OpenGIS specification lists some known values, and otherwise EPSG datum names with a standard transformation are considered legal keys.

*pszSpheroidName* user visible spheroid name (not to serve as a key)

*dfSemiMajor* the semi major axis of the spheroid.

*dfInvFlattening* the inverse flattening for the spheroid. This can be computed from the semi minor axis as  $1/f = 1.0 / (1.0 - \text{semiminor}/\text{semimajor})$ .

*pszPMName* the name of the prime meridian (not to serve as a key) If this is NULL a default value of "Greenwich" will be used.

*dfPMOffset* the longitude of greenwich relative to this prime meridian.

*pszAngularUnits* the angular units name (see `ogr_srs_api.h` (p. 392) for some standard names). If NULL a value of "degrees" will be assumed.

*dfConvertToRadians* value to multiply angular units by to transform them to radians. A value of SRS\_UL\_DEGREE\_CONV will be used if *pszAngularUnits* is NULL.

**Returns:**

OGRERR\_NONE on success.

References `OGR_SRSNode::AddChild()`, `Clear()`, `CPLAtof()`, `OGR_SRSNode::DestroyChild()`, `OGR_SRSNode::FindChild()`, `GetAttrNode()`, `OGR_SRSNode::InsertChild()`, and `SetRoot()`.

Referenced by `importFromPanorama()`, `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

### 16.29.3.62 OGRErr OGRSpatialReference::SetGEOS (double *dfCentralMeridian*, double *dfSatelliteHeight*, double *dfFalseEasting*, double *dfFalseNorthing*)

Geostationary Satellite

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromProj4()`.

### 16.29.3.63 OGRErr OGRSpatialReference::SetGH (double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)

Goode Homolosine

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromProj4()`.

### 16.29.3.64 OGRErr OGRSpatialReference::SetGnomonic (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

Gnomonic

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromPanorama()`, `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

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### 16.29.3.65 OGRErr OGRSpatialReference::SetGS (double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)

Gall Stereographic

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

### 16.29.3.66 OGRErr OGRSpatialReference::SetHOM (double *dfCenterLat*, double *dfCenterLong*, double *dfAzimuth*, double *dfRectToSkew*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Set a Hotine Oblique Mercator projection using azimuth angle.

This method does the same thing as the C function **OSRSetHOM()** (p. 397).

#### Parameters:

*dfCenterLat* Latitude of the projection origin.

*dfCenterLong* Longitude of the projection origin.

*dfAzimuth* Azimuth, measured clockwise from North, of the projection centerline.

*dfRectToSkew* ?.

*dfScale* Scale factor applies to the projection origin.

*dfFalseEasting* False easting.

*dfFalseNorthing* False northing.

#### Returns:

OGRERR\_NONE on success.

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4(), and importFromUSGS().

### 16.29.3.67 OGRErr OGRSpatialReference::SetHOM2PNO (double *dfCenterLat*, double *dfLat1*, double *dfLong1*, double *dfLat2*, double *dfLong2*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Set a Hotine Oblique Mercator projection using two points on projection centerline.

This method does the same thing as the C function **OSRSetHOM2PNO()** (p. 397).

#### Parameters:

*dfCenterLat* Latitude of the projection origin.

*dfLat1* Latitude of the first point on center line.

*dfLong1* Longitude of the first point on center line.

*dfLat2* Latitude of the second point on center line.

*dfLong2* Longitude of the second point on center line.

*dfScale* Scale factor applies to the projection origin.

*dfFalseEasting* False easting.

*dfFalseNorthing* False northing.

**Returns:**

OGRERR\_NONE on success.

References SetNormProjParm(), and SetProjection().

Referenced by importFromUSGS().

**16.29.3.68 OGRErr OGRSpatialReference::SetKrovak (double *dfCenterLat*, double *dfCenterLong*, double *dfAzimuth*, double *dfPseudoStdParallelLat*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Krovak Oblique Conic Conformal

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

**16.29.3.69 OGRErr OGRSpatialReference::SetLAEA (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Azimuthal Equal-Area

References SetNormProjParm(), and SetProjection().

Referenced by importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

**16.29.3.70 OGRErr OGRSpatialReference::SetLCC (double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic

References SetNormProjParm(), and SetProjection().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

**16.29.3.71 OGRErr OGRSpatialReference::SetLCC1SP (double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic 1SP

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

**16.29.3.72 OGRErr OGRSpatialReference::SetLCCB (double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic (Belgium)

References SetNormProjParm(), and SetProjection().

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### 16.29.3.73 OGRErr OGRSpatialReference::SetLinearUnits (const char \* *pszUnitsName*, double *dfInMeters*)

Set the linear units for the projection.

This method creates a UNITS subnode with the specified values as a child of the PROJCS or LOCAL\_CS node.

This method does the same as the C function OSRSetLinearUnits().

#### Parameters:

*pszUnitsName* the units name to be used. Some preferred units names can be found in **ogr\_srs\_api.h** (p. 392) such as SRS\_UL\_METER, SRS\_UL\_FOOT and SRS\_UL\_US\_FOOT.

*dfInMeters* the value to multiply by a length in the indicated units to transform to meters. Some standard conversion factors can be found in **ogr\_srs\_api.h** (p. 392).

#### Returns:

OGRErr\_NONE on success.

References OGR\_SRSNode::AddChild(), OGR\_SRSNode::DestroyChild(), OGR\_SRSNode::FindChild(), GetAttrNode(), OGR\_SRSNode::GetChild(), and OGR\_SRSNode::SetValue().

Referenced by Fixup(), importFromERM(), importFromPanorama(), importFromPCI(), importFromProj4(), importFromUSGS(), SetLinearUnitsAndUpdateParameters(), SetStatePlane(), and SetUTM().

### 16.29.3.74 OGRErr OGRSpatialReference::SetLinearUnitsAndUpdateParameters (const char \* *pszName*, double *dfInMeters*)

Set the linear units for the projection.

This method creates a UNITS subnode with the specified values as a child of the PROJCS or LOCAL\_CS node. It works the same as the **SetLinearUnits()** (p. 250) method, but it also updates all existing linear projection parameter values from the old units to the new units.

#### Parameters:

*pszUnitsName* the units name to be used. Some preferred units names can be found in **ogr\_srs\_api.h** (p. 392) such as SRS\_UL\_METER, SRS\_UL\_FOOT and SRS\_UL\_US\_FOOT.

*dfInMeters* the value to multiply by a length in the indicated units to transform to meters. Some standard conversion factors can be found in **ogr\_srs\_api.h** (p. 392).

#### Returns:

OGRErr\_NONE on success.

References GetAttrNode(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), GetLinearUnits(), GetProjParm(), OGR\_SRSNode::GetValue(), SetLinearUnits(), and SetProjParm().

Referenced by importFromESRI().

### 16.29.3.75 OGRErr OGRSpatialReference::SetLocalCS (const char \* *pszName*)

Set the user visible LOCAL\_CS name.

This method is the same as the C function `OSRSetLocalCS()`.

This method will ensure a `LOCAL_CS` node is created as the root, and set the provided name on it. It must be used before `SetLinearUnits()` (p. 250).

**Parameters:**

*pszName* the user visible name to assign. Not used as a key.

**Returns:**

`OGRERR_NONE` on success.

References `GetAttrNode()`, and `SetNode()`.

Referenced by `importFromESRI()`, `importFromPanorama()`, `importFromPCI()`, `importFromUSGS()`, and `SetStatePlane()`.

**16.29.3.76 OGRErr OGRSpatialReference::SetMC (double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)**

Miller Cylindrical

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

**16.29.3.77 OGRErr OGRSpatialReference::SetMercator (double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)**

Mercator

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromPanorama()`, `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

**16.29.3.78 OGRErr OGRSpatialReference::SetMollweide (double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)**

Mollweide

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromPanorama()`, `importFromProj4()`, and `importFromUSGS()`.

**16.29.3.79 OGRErr OGRSpatialReference::SetNode (const char \* pszNodePath, const char \* pszNewNodeValue)**

Set attribute value in spatial reference.

Missing intermediate nodes in the path will be created if not already in existence. If the attribute has no children one will be created and assigned the value otherwise the zeroth child will be assigned the value.

This method does the same as the C function `OSRSetAttrValue()`.

**Parameters:**

*pszNodePath* full path to attribute to be set. For instance "PROJCS|GEOGCS|UNITS".

*pszNewNodeValue* value to be assigned to node, such as "meter". This may be NULL if you just want to force creation of the intermediate path.

#### Returns:

OGRERR\_NONE on success.

References OGR\_SRSNode::AddChild(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), OGR\_SRSNode::GetValue(), SetRoot(), and OGR\_SRSNode::SetValue().

Referenced by morphFromESRI(), morphToESRI(), SetLocalCS(), SetProjCS(), SetProjection(), and SetUTM().

### 16.29.3.80 OGRErr OGRSpatialReference::SetNormProjParm (const char \* *pszName*, double *dfValue*)

Set a projection parameter with a normalized value.

This method is the same as **SetProjParm()** (p. 254) except that the value of the parameter passed in is assumed to be in "normalized" form (decimal degrees for angular values, meters for linear values. The values are converted in a form suitable for the GEOGCS and linear units in effect.

This method is the same as the C function OSRSetNormProjParm().

#### Parameters:

*pszName* the parameter name, which should be selected from the macros in **ogr\_srs\_api.h** (p. 392), such as SRS\_PP\_CENTRAL\_MERIDIAN.

*dfValue* value to assign.

#### Returns:

OGRERR\_NONE on success.

References SetProjParm().

Referenced by importFromProj4(), SetACEA(), SetAE(), SetBonne(), SetCEA(), SetCS(), SetEC(), SetEckert(), SetEquirectangular(), SetGEOS(), SetGH(), SetGnomonic(), SetGS(), SetHOM(), SetHOM2PNO(), SetKrovak(), SetLAEA(), SetLCC(), SetLCC1SP(), SetLCCB(), SetMC(), SetMercator(), SetMollweide(), SetNZMG(), SetOrthographic(), SetOS(), SetPolyconic(), SetPS(), SetRobinson(), SetSinusoidal(), SetSOC(), SetStatePlane(), SetStereographic(), SetTM(), SetTMG(), SetTMSO(), SetTMVariant(), SetTPED(), SetUTM(), and SetVDG().

### 16.29.3.81 OGRErr OGRSpatialReference::SetNZMG (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

New Zealand Map Grid

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

### 16.29.3.82 OGRErr OGRSpatialReference::SetOrthographic (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

Orthographic

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References SetNormProjParm(), and SetProjection().

Referenced by importFromPCI(), importFromProj4(), and importFromUSGS().

#### 16.29.3.83 OGRErr OGRSpatialReference::SetOS (double *dfOriginLat*, double *dfCMeridian*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Oblique Stereographic

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

#### 16.29.3.84 OGRErr OGRSpatialReference::SetPolyconic (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

Polyconic

References SetNormProjParm(), and SetProjection().

Referenced by importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

#### 16.29.3.85 OGRErr OGRSpatialReference::SetProjCS (const char \* *pszName*)

Set the user visible PROJCS name.

This method is the same as the C function OSRSetProjCS().

This method will ensure a PROJCS node is created as the root, and set the provided name on it. If used on a GEOGCS coordinate system, the GEOGCS node will be demoted to be a child of the new PROJCS root.

##### Parameters:

*pszName* the user visible name to assign. Not used as a key.

##### Returns:

OGRERR\_NONE on success.

References GetAttrNode(), OGR\_SRSNode::GetValue(), OGR\_SRSNode::InsertChild(), and SetNode().

#### 16.29.3.86 OGRErr OGRSpatialReference::SetProjection (const char \* *pszProjection*)

Set a projection name.

This method is the same as the C function OSRSetProjection().

##### Parameters:

*pszProjection* the projection name, which should be selected from the macros in **ogr\_srs\_api.h** (p. 392), such as SRS\_PT\_TRANSVERSE\_MERCATOR.

##### Returns:

OGRERR\_NONE on success.

---

References `GetAttrNode()`, `OGR_SRSNode::GetValue()`, `OGR_SRSNode::InsertChild()`, and `SetNode()`.

Referenced by `SetACEA()`, `SetAE()`, `SetBonne()`, `SetCEA()`, `SetCS()`, `SetEC()`, `SetEckert()`, `SetEquirectangular()`, `SetGEOS()`, `SetGH()`, `SetGnomonic()`, `SetGS()`, `SetHOM()`, `SetHOM2PNO()`, `SetKrovak()`, `SetLAEA()`, `SetLCC()`, `SetLCC1SP()`, `SetLCCB()`, `SetMC()`, `SetMercator()`, `SetMollweide()`, `SetNZMG()`, `SetOrthographic()`, `SetOS()`, `SetPolyconic()`, `SetPS()`, `SetRobinson()`, `SetSinusoidal()`, `SetSOC()`, `SetStereographic()`, `SetTM()`, `SetTMG()`, `SetTMSO()`, `SetTMVariant()`, `SetTPED()`, `SetUTM()`, and `SetVDG()`.

### 16.29.3.87 **OGRERR OGRSpatialReference::SetProjParm** (*const char \*pszParmName*, *double dfValue*)

Set a projection parameter value.

Adds a new PARAMETER under the PROJCS with the indicated name and value.

This method is the same as the C function `OSRSetProjParm()`.

Please check [http://www.remotesensing.org/geotiff/proj\\_list](http://www.remotesensing.org/geotiff/proj_list) pages for legal parameter names for specific projections.

#### Parameters:

*pszParmName* the parameter name, which should be selected from the macros in `ogr_srs_api.h` (p. 392), such as `SRS_PP_CENTRAL_MERIDIAN`.

*dfValue* value to assign.

#### Returns:

`OGRERR_NONE` on success.

References `OGR_SRSNode::AddChild()`, `GetAttrNode()`, `OGR_SRSNode::GetChild()`, `OGR_SRSNode::GetChildCount()`, `OGR_SRSNode::GetValue()`, and `OGR_SRSNode::SetValue()`.

Referenced by `morphFromESRI()`, `SetLinearUnitsAndUpdateParameters()`, and `SetNormProjParm()`.

### 16.29.3.88 **OGRERR OGRSpatialReference::SetPS** (*double dfCenterLat*, *double dfCenterLong*, *double dfScale*, *double dfFalseEasting*, *double dfFalseNorthing*)

Polar Stereographic

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromESRI()`, `importFromPanorama()`, `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

### 16.29.3.89 **OGRERR OGRSpatialReference::SetRobinson** (*double dfCenterLong*, *double dfFalseEasting*, *double dfFalseNorthing*)

Robinson

References `SetNormProjParm()`, and `SetProjection()`.

Referenced by `importFromPCI()`, `importFromProj4()`, and `importFromUSGS()`.

### 16.29.3.90 **void OGRSpatialReference::SetRoot** (*OGR\_SRSNode \*poNewRoot*)

Set the root SRS node.

If the object has an existing tree of OGR\_SRSNodes, they are destroyed as part of assigning the new root. Ownership of the passed **OGR\_SRSNode** (p. 79) is assumed by the **OGRSpatialReference** (p. 217).

**Parameters:**

*poNewRoot* object to assign as root.

Referenced by CopyGeogCSFrom(), SetGeogCS(), and SetNode().

**16.29.3.91 OGRErr OGRSpatialReference::SetSinusoidal (double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)**

Sinusoidal

References SetNormProjParm(), and SetProjection().

Referenced by importFromPCI(), importFromProj4(), and importFromUSGS().

**16.29.3.92 OGRErr OGRSpatialReference::SetSOC (double dfLatitudeOfOrigin, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)**

Swiss Oblique Cylindrical

References SetNormProjParm(), and SetProjection().

**16.29.3.93 OGRErr OGRSpatialReference::SetStatePlane (int nZone, int bNAD83 = TRUE, const char \* pszOverrideUnitName = NULL, double dfOverrideUnit = 0.0)**

State Plane

Set State Plane projection definition.

This will attempt to generate a complete definition of a state plane zone based on generating the entire SRS from the EPSG tables. If the EPSG tables are unavailable, it will produce a stubbed LOCAL\_CS definition and return OGRERR\_FAILURE.

This method is the same as the C function OSRSetStatePlaneWithUnits().

**Parameters:**

*nZone* State plane zone number, in the USGS numbering scheme (as distinct from the Arc/Info and Erdas numbering scheme).

*bNAD83* TRUE if the NAD83 zone definition should be used or FALSE if the NAD27 zone definition should be used.

*pszOverrideUnitName* Linear unit name to apply overriding the legal definition for this zone.

*dfOverrideUnit* Linear unit conversion factor to apply overriding the legal definition for this zone.

**Returns:**

OGRERR\_NONE on success, or OGRERR\_FAILURE on failure, mostly likely due to the EPSG tables not being accessible.

References Clear(), CPLAtof(), OGR\_SRSNode::DestroyChild(), OGR\_SRSNode::FindChild(), GetAttrNode(), GetLinearUnits(), GetNormProjParm(), importFromEPSG(), SetLinearUnits(), SetLocalCS(), and SetNormProjParm().

Referenced by importFromESRI(), importFromPCI(), and importFromUSGS().

### 16.29.3.94 **OGRERR OGRSpatialReference::SetStereographic** (double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Stereographic

References SetNormProjParm(), and SetProjection().

Referenced by importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

### 16.29.3.95 **OGRERR OGRSpatialReference::SetTM** (double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Transverse Mercator

References SetNormProjParm(), and SetProjection().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

### 16.29.3.96 **OGRERR OGRSpatialReference::SetTMG** (double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

Tunesia Mining Grid

References SetNormProjParm(), and SetProjection().

### 16.29.3.97 **OGRERR OGRSpatialReference::SetTMSO** (double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Transverse Mercator (South Oriented)

References SetNormProjParm(), and SetProjection().

### 16.29.3.98 **OGRERR OGRSpatialReference::SetTMVariant** (const char \* *pszVariantName*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)

Transverse Mercator variants.

References SetNormProjParm(), and SetProjection().

### 16.29.3.99 **OGRERR OGRSpatialReference::SetTOWGS84** (double *dfDX*, double *dfDY*, double *dfDZ*, double *dfEX* = 0.0, double *dfEY* = 0.0, double *dfEZ* = 0.0, double *dfPPM* = 0.0)

Set the Bursa-Wolf conversion to WGS84.

This will create the TOWGS84 node as a child of the DATUM. It will fail if there is no existing DATUM node. Unlike most **OGRSpatialReference** (p.217) methods it will insert itself in the appropriate order, and will replace an existing TOWGS84 node if there is one.

The parameters have the same meaning as EPSG transformation 9606 (Position Vector 7-param. transformation).

This method is the same as the C function OSRSetTOWGS84().

---

**Parameters:**

*dfDX* X child in meters.  
*dfDY* Y child in meters.  
*dfDZ* Z child in meters.  
*dfEX* X rotation in arc seconds (optional, defaults to zero).  
*dfEY* Y rotation in arc seconds (optional, defaults to zero).  
*dfEZ* Z rotation in arc seconds (optional, defaults to zero).  
*dfPPM* scaling factor (parts per million).

**Returns:**

OGRERR\_NONE on success.

References OGR\_SRSNode::AddChild(), OGR\_SRSNode::DestroyChild(), OGR\_SRSNode::FindChild(), GetAttrNode(), OGR\_SRSNode::GetChildCount(), and OGR\_SRSNode::InsertChild().

Referenced by importFromProj4().

### 16.29.3.100 OGRErr OGRSpatialReference::SetTPED (double *dfLat1*, double *dfLong1*, double *dfLat2*, double *dfLong2*, double *dfFalseEasting*, double *dfFalseNorthing*)

Two Point Equidistant

References SetNormProjParm(), and SetProjection().

Referenced by importFromProj4().

### 16.29.3.101 OGRErr OGRSpatialReference::SetUTM (int *nZone*, int *bNorth* = TRUE)

Universal Transverse Mercator

Set UTM projection definition.

This will generate a projection definition with the full set of transverse mercator projection parameters for the given UTM zone. If no PROJCS[] description is set yet, one will be set to look like "UTM Zone %d, {Northern, Southern} Hemisphere".

This method is the same as the C function OSRSetUTM().

**Parameters:**

*nZone* UTM zone.  
*bNorth* TRUE for northern hemisphere, or FALSE for southern hemisphere.

**Returns:**

OGRERR\_NONE on success.

References GetAttrValue(), SetLinearUnits(), SetNode(), SetNormProjParm(), and SetProjection().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), and importFromUSGS().

### 16.29.3.102 OGRErr OGRSpatialReference::SetVDG (double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)

VanDerGrinten

References SetNormProjParm(), and SetProjection().

Referenced by importFromPCI(), importFromProj4(), and importFromUSGS().

### 16.29.3.103 OGRErr OGRSpatialReference::SetWellKnownGeogCS (const char \* *pszName*)

Set a GeogCS based on well known name.

This may be called on an empty **OGRSpatialReference** (p. 217) to make a geographic coordinate system, or on something with an existing PROJCS node to set the underlying geographic coordinate system of a projected coordinate system.

The following well known text values are currently supported:

- "WGS84": same as "EPSG:4326" but has no dependence on EPSG data files.
- "WGS72": same as "EPSG:4322" but has no dependence on EPSG data files.
- "NAD27": same as "EPSG:4267" but has no dependence on EPSG data files.
- "NAD83": same as "EPSG:4269" but has no dependence on EPSG data files.
- "EPSG:n": same as doing an ImportFromEPSG(n).

#### Parameters:

*pszName* name of well known geographic coordinate system.

#### Returns:

OGRErr\_NONE on success, or OGRErr\_FAILURE if the name isn't recognised, the target object is already initialized, or an EPSG value can't be successfully looked up.

References CopyGeogCSFrom(), importFromEPSG(), importFromWkt(), and IsGeographic().

Referenced by importFromESRI(), importFromPanorama(), importFromPCI(), importFromProj4(), importFromURN(), importFromUSGS(), and SetFromUserInput().

### 16.29.3.104 OGRErr OGRSpatialReference::StripCTParms (OGR\_SRSNode \* *poCurrent* = NULL)

Strip OGC CT Parameters.

This method will remove all components of the coordinate system that are specific to the OGC CT Specification. That is it will attempt to strip it down to being compatible with the Simple Features 1.0 specification.

This method is the same as the C function OSRStripCTParms().

#### Parameters:

*poCurrent* node to operate on. NULL to operate on whole tree.

#### Returns:

OGRErr\_NONE on success or an error code.

References OGR\_SRSNode::GetValue(), and OGR\_SRSNode::StripNodes().

Referenced by morphToESRI().

#### 16.29.3.105 OGRErr OGRSpatialReference::Validate ()

Validate SRS tokens.

This method attempts to verify that the spatial reference system is well formed, and consists of known tokens. The validation is not comprehensive.

This method is the same as the C function OSRValidate().

##### Returns:

OGRERR\_NONE if all is fine, OGRERR\_CORRUPT\_DATA if the SRS is not well formed, and OGRERR\_UNSUPPORTED\_SRS if the SRS is well formed, but contains non-standard PROJECTION[] values.

References CPLAtof(), OGR\_SRSNode::GetChild(), OGR\_SRSNode::GetChildCount(), OGR\_SRSNode::GetNode(), and OGR\_SRSNode::GetValue().

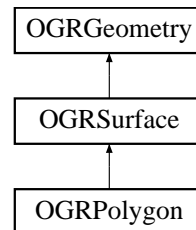
The documentation for this class was generated from the following files:

- **ogr\_spatialref.h**
- ogr\_fromepsg.cpp
- ogr\_srs\_dict.cpp
- ogr\_srs\_erm.cpp
- ogr\_srs\_esri.cpp
- ogr\_srs\_panorama.cpp
- ogr\_srs\_pci.cpp
- ogr\_srs\_proj4.cpp
- ogr\_srs\_usgs.cpp
- ogr\_srs\_validate.cpp
- ogr\_srs\_xml.cpp
- ogrspatialreference.cpp

## 16.30 OGRSurface Class Reference

```
#include <ogr_geometry.h>
```

Inheritance diagram for OGRSurface::



### Public Member Functions

- virtual double **get\_Area** () const =0
- virtual OGRErr **Centroid** (OGRPoint \*poPoint) const =0
- virtual OGRErr **PointOnSurface** (OGRPoint \*poPoint) const =0

### 16.30.1 Detailed Description

Abstract base class for 2 dimensional objects like polygons.

### 16.30.2 Member Function Documentation

#### 16.30.2.1 OGRErr OGRSurface::Centroid (OGRPoint \*poPoint) const [pure virtual]

Compute and return centroid of surface. The centroid is not necessarily within the geometry.

This method relates to the SFCOM ISurface::get\_Centroid() method.

NOTE: Only implemented when GEOS included in build.

#### Parameters:

*poPoint* point to be set with the centroid location.

#### Returns:

OGRErr\_NONE if it succeeds or OGRErr\_FAILURE otherwise.

Implemented in **OGRPolygon** (p. 202).

#### 16.30.2.2 double OGRSurface::get\_Area () const [pure virtual]

Get the area of the surface object.

For polygons the area is computed as the area of the outer ring less the area of all internal rings.

This method relates to the SFCOM ISurface::get\_Area() method.

**Returns:**

the area of the feature in square units of the spatial reference system in use.

Implemented in **OGRPolygon** (p. 204).

**16.30.2.3 OGRErr OGRSurface::PointOnSurface (OGRPoint \* *poPoint*) const** [pure virtual]

This method relates to the SFCOM ISurface::get\_PointOnSurface() method.

NOTE: Only implemented when GEOS included in build.

**Parameters:**

*poPoint* point to be set with an internal point.

**Returns:**

OGRERR\_NONE if it succeeds or OGRERR\_FAILURE otherwise.

Implemented in **OGRPolygon** (p. 208).

The documentation for this class was generated from the following files:

- **ogr\_geometry.h**
- **ogrsurface.cpp**



# Chapter 17

## File Documentation

### 17.1 cpl\_conv.h File Reference

```
#include "cpl_port.h"
#include "cpl_vsi.h"
#include "cpl_error.h"
```

#### Classes

- struct **CPLSharedFileInfo**
- class **CPLLocaleC**

#### Functions

- void \* **CPLMalloc** (size\_t)
- void \* **CPLCalloc** (size\_t, size\_t)
- void \* **CPLRealloc** (void \*, size\_t)
- char \* **CPLStrdup** (const char \*)
- char \* **CPLStrlwr** (char \*)
- char \* **CPLFGets** (char \*, int, FILE \*)
- const char \* **CPLReadLine** (FILE \*)
- const char \* **CPLReadLineL** (FILE \*)
- double **CPLAtof** (const char \*)
- double **CPLAtofDelim** (const char \*, char)
- double **CPLStrtod** (const char \*, char \*\*)
- double **CPLStrtodDelim** (const char \*, char \*\*, char)
- float **CPLStrtof** (const char \*, char \*\*)
- float **CPLStrtofDelim** (const char \*, char \*\*, char)
- double **CPLAtofM** (const char \*)
- char \* **CPLScanString** (const char \*, int, int, int)
- double **CPLScanDouble** (const char \*, int)
- long **CPLScanLong** (const char \*, int)
- unsigned long **CPLScanULong** (const char \*, int)
- GUIntBig **CPLScanUIntBig** (const char \*, int)

- void \* **CPLScanPointer** (const char \*, int)
- int **CPLPrintString** (char \*, const char \*, int)
- int **CPLPrintStringFill** (char \*, const char \*, int)
- int **CPLPrintInt32** (char \*, GInt32, int)
- int **CPLPrintUIntBig** (char \*, GUIntBig, int)
- int **CPLPrintDouble** (char \*, const char \*, double, const char \*)
- int **CPLPrintTime** (char \*, int, const char \*, const struct tm \*, const char \*)
- int **CPLPrintPointer** (char \*, void \*, int)
- void \* **CPLGetSymbol** (const char \*, const char \*)
- int **CPLGetExecPath** (char \*pszPathBuf, int nMaxLength)
- const char \* **CPLGetPath** (const char \*)
- const char \* **CPLGetDirname** (const char \*)
- const char \* **CPLGetFilename** (const char \*)
- const char \* **CPLGetBasename** (const char \*)
- const char \* **CPLGetExtension** (const char \*)
- char \* **CPLGetCurrentDir** (void)
- const char \* **CPLFormFilename** (const char \*pszPath, const char \*pszBasename, const char \*pszExtension)
- const char \* **CPLFormCIFilename** (const char \*pszPath, const char \*pszBasename, const char \*pszExtension)
- const char \* **CPLResetExtension** (const char \*, const char \*)
- const char \* **CPLProjectRelativeFilename** (const char \*pszProjectDir, const char \*pszSecondaryFilename)
- int **CPLIsFilenameRelative** (const char \*pszFilename)
- const char \* **CPLExtractRelativePath** (const char \*, const char \*, int \*)
- const char \* **CPLCleanTrailingSlash** (const char \*)
- char \*\* **CPLCorrespondingPaths** (const char \*pszOldFilename, const char \*pszNewFilename, char \*\*papszFileList)
- int **CPLCheckForFile** (char \*pszFilename, char \*\*papszSiblingList)
- FILE \* **CPLOpenShared** (const char \*, const char \*, int)
- void **CPLCloseShared** (FILE \*)
- CPLSharedFileInfo \* **CPLGetSharedList** (int \*)
- void **CPLDumpSharedList** (FILE \*)
- double **CPLPackedDMSToDec** (double)
- double **CPLDecToPackedDMS** (double dfDec)

### 17.1.1 Detailed Description

Various convenience functions for CPL.

### 17.1.2 Function Documentation

#### 17.1.2.1 double CPLAtof (const char \* *nptr*)

Converts ASCII string to floating point number.

This function converts the initial portion of the string pointed to by *nptr* to double floating point representation. The behaviour is the same as

```
CPLStrtod(nptr, (char **)NULL);
```

---

This function does the same as standard `atof(3)`, but does not take locale in account. That means, the decimal delimiter is always `'.'` (decimal point). Use **CPLAtofDelim()** (p. 265) function if you want to specify custom delimiter.

**IMPORTANT NOTE.** Existence of this function does not mean you should always use it. Sometimes you should use standard locale aware `atof(3)` and its family. When you need to process the user's input (for example, command line parameters) use `atof(3)`, because user works in localized environment and her input will be done accordingly the locale set. In particular that means we should not make assumptions about character used as decimal delimiter, it can be either `"."` or `","`. But when you are parsing some ASCII file in predefined format, you most likely need **CPLAtof()** (p. 264), because such files distributed across the systems with different locales and floating point representation should be considered as a part of file format. If the format uses `","` as a delimiter the same character must be used when parsing number regardless of actual locale setting.

#### Parameters:

*nptr* Pointer to string to convert.

#### Returns:

Converted value, if any.

References `CPLAtof()`, and `CPLStrtod()`.

Referenced by `CPLAtof()`, `CPLScanDouble()`, `OGRSpatialReference::exportToProj4()`, `OGRSpatialReference::Fixup()`, `OGRSpatialReference::GetAngularUnits()`, `OGRSpatialReference::GetInvFlattening()`, `OGRSpatialReference::GetLinearUnits()`, `OGRSpatialReference::GetPrimeMeridian()`, `OGRSpatialReference::GetProjParm()`, `OGRSpatialReference::GetSemiMajor()`, `OGRSpatialReference::GetTOWGS84()`, `OGRSpatialReference::importFromProj4()`, `OGRSpatialReference::IsSameGeogCS()`, `OGRSpatialReference::SetGeogCS()`, `OGRSpatialReference::SetStatePlane()`, and `OGRSpatialReference::Validate()`.

#### 17.1.2.2 double CPLAtofDelim (const char \* *nptr*, char *point*)

Converts ASCII string to floating point number.

This function converts the initial portion of the string pointed to by *nptr* to double floating point representation. The behaviour is the same as

`CPLStrtodDelim(nptr, (char **)NULL, point);`

This function does the same as standard `atof(3)`, but does not take locale in account. Instead of locale defined decimal delimiter you can specify your own one. Also see notes for **CPLAtof()** (p. 264) function.

#### Parameters:

*nptr* Pointer to string to convert.

*point* Decimal delimiter.

#### Returns:

Converted value, if any.

References `CPLAtofDelim()`, and `CPLStrtodDelim()`.

Referenced by `CPLAtofDelim()`.

---

### 17.1.2.3 double CPLAtofM (const char \* *nptr*)

Converts ASCII string to floating point number using any numeric locale.

This function converts the initial portion of the string pointed to by *nptr* to double floating point representation. This function does the same as standard `atof()`, but it allows a variety of locale representations. That is it supports numeric values with either a comma or a period for the decimal delimiter.

PS. The M stands for Multi-lingual.

#### Parameters:

*nptr* The string to convert.

#### Returns:

Converted value, if any. Zero on failure.

References `CPLAtofM()`, and `CPLStrtodDelim()`.

Referenced by `CPLAtofM()`, and `OGRSpatialReference::importFromProj4()`.

### 17.1.2.4 void\* CPLCalloc (size\_t *nCount*, size\_t *nSize*)

Safe version of `calloc()`.

This function is like the C library `calloc()`, but raises a `CE_Fatal` error with **CPLError()** (p. 287) if it fails to allocate the desired memory. It should be used for small memory allocations that are unlikely to fail and for which the application is unwilling to test for out of memory conditions. It uses `VSICalloc()` to get the memory, so any hooking of `VSICalloc()` will apply to **CPLCalloc()** (p. 266) as well. `CPLFree()` or `VSIFree()` can be used free memory allocated by **CPLCalloc()** (p. 266).

#### Parameters:

*nCount* number of objects to allocate.

*nSize* size (in bytes) of object to allocate.

#### Returns:

pointer to newly allocated memory, only NULL if *nSize* \* *nCount* is NULL.

### 17.1.2.5 int CPLCheckForFile (char \* *pszFilename*, char \*\* *papszSiblingFiles*)

Check for file existence.

The function checks if a named file exists in the filesystem, hopefully in an efficient fashion if a sibling file list is available. It exists primarily to do faster file checking for functions like GDAL open methods that get a list of files from the target directory.

If the sibling file list exists (is not NULL) it is assumed to be a list of files in the same directory as the target file, and it will be checked (case insensitively) for a match. If a match is found, *pszFilename* is updated with the correct case and TRUE is returned.

If *papszSiblingFiles* is NULL, a **VSISStatL()** (p. 320) is used to test for the files existence, and no case insensitive testing is done.

---

**Parameters:**

*pszFilename* name of file to check for - filename case updated in some cases.

*papszSiblingFiles* a list of files in the same directory as pszFilename if available, or NULL. This list should have no path components.

**Returns:**

TRUE if a match is found, or FALSE if not.

References CPLGetFilename(), and VSISatL().

**17.1.2.6 const char\* CPLCleanTrailingSlash (const char \*pszFilename)**

Remove trailing forward/backward slash from the path for unix/windows resp.

Returns a string containing the portion of the passed path string with trailing slash removed. If there is no path in the passed filename an empty string will be returned (not NULL).

```
CPLCleanTrailingSlash( "abc/def/" ) == "abc/def"
CPLCleanTrailingSlash( "abc/def" ) == "abc/def"
CPLCleanTrailingSlash( "c:\abc\def\" ) == "c:\abc\def"
CPLCleanTrailingSlash( "c:\abc\def" ) == "c:\abc\def"
CPLCleanTrailingSlash( "abc" ) == "abc"
```

**Parameters:**

*pszPath* the path to be cleaned up

**Returns:**

Path in an internal string which must not be freed. The string may be destroyed by the next CPL filename handling call. The returned will generally not contain a trailing path separator.

References CPLCleanTrailingSlash().

Referenced by CPLCleanTrailingSlash().

**17.1.2.7 void CPLCloseShared (FILE \*fp)**

Close shared file.

Dereferences the indicated file handle, and closes it if the reference count has dropped to zero. A **CPLERROR()** (p. 287) is issued if the file is not in the shared file list.

**Parameters:**

*fp* file handle from **CPLOpenShared()** (p. 275) to deaccess.

References VSIFCloseL().

---

### 17.1.2.8 **char\*\* CPLCorrespondingPaths** (const char \* *pszOldFilename*, const char \* *pszNewFilename*, char \*\* *papszFileList*)

Identify corresponding paths.

Given a prototype old and new filename this function will attempt to determine corresponding names for a set of other old filenames that will rename them in a similar manner. This correspondance assumes there are two possibly kinds of renaming going on. A change of path, and a change of filename stem.

If a consistent renaming cannot be established for all the files this function will return indicating an error.

The returned file list becomes owned by the caller and should be destroyed with **CSLDestroy()** (p. 308).

#### Parameters:

*pszOldFilename* path to old prototype file.

*pszNewFilename* path to new prototype file.

*papszFileList* list of other files associated with *pszOldFilename* to rename similarly.

#### Returns:

a list of files corresponding to *papszFileList* but renamed to correspond to *pszNewFilename*.

References **CPLCorrespondingPaths()**, **CPLFormFilename()**, **CPLGetBasename()**, **CPLGetFilename()**, and **CPLGetPath()**.

Referenced by **CPLCorrespondingPaths()**.

### 17.1.2.9 **double CPLDecToPackedDMS** (double *dfDec*)

Convert decimal degrees into packed DMS value (DDDMMMSSS.SS).

This function converts a value, specified in decimal degrees into packed DMS angle. The standard packed DMS format is:

degrees \* 1000000 + minutes \* 1000 + seconds

See also **CPLPackedDMSToDec()** (p. 275).

#### Parameters:

*dfDec* Angle in decimal degrees.

#### Returns:

Angle in packed DMS format.

### 17.1.2.10 **void CPLDumpSharedList** (FILE \* *fp*)

Report open shared files.

Dumps all open shared files to the indicated file handle. If the file handle is NULL information is sent via the **CPLDebug()** (p. 286) call.

#### Parameters:

*fp* File handle to write to.

---

### 17.1.2.11 **const char\* CPLExtractRelativePath (const char \* *pszBaseDir*, const char \* *pszTarget*, int \* *pbGotRelative*)**

Get relative path from directory to target file.

Computes a relative path for *pszTarget* relative to *pszBaseDir*. Currently this only works if they share a common base path. The returned path is normally into the *pszTarget* string. It should only be considered valid as long as *pszTarget* is valid or till the next call to this function, whichever comes first.

#### Parameters:

*pszBaseDir* the name of the directory relative to which the path should be computed. *pszBaseDir* may be NULL in which case the original target is returned without relativizing.

*pszTarget* the filename to be changed to be relative to *pszBaseDir*.

*pbGotRelative* Pointer to location in which a flag is placed indicating that the returned path is relative to the basename (TRUE) or not (FALSE). This pointer may be NULL if flag is not desired.

#### Returns:

an adjusted path or the original if it could not be made relative to the *pszBaseFile*'s path.

References CPLExtractRelativePath(), and CPLGetPath().

Referenced by CPLExtractRelativePath().

### 17.1.2.12 **char\* CPLFGets (char \* *pszBuffer*, int *nBufferSize*, FILE \* *fp*)**

Reads in at most one less than *nBufferSize* characters from the *fp* stream and stores them into the buffer pointed to by *pszBuffer*. Reading stops after an EOF or a newline. If a newline is read, it is `_not_` stored into the buffer. A `''` is stored after the last character in the buffer. All three types of newline terminators recognized by the **CPLFGets()** (p. 269): single `''` and `'`

`'` and `'`

`'` combination.

#### Parameters:

*pszBuffer* pointer to the targeting character buffer.

*nBufferSize* maximum size of the string to read (not including terminating `''`).

*fp* file pointer to read from.

#### Returns:

pointer to the *pszBuffer* containing a string read from the file or NULL if the error or end of file was encountered.

### 17.1.2.13 **const char\* CPLFormCIFilename (const char \* *pszPath*, const char \* *pszBasename*, const char \* *pszExtension*)**

Case insensitive file searching, returning full path.

This function tries to return the path to a file regardless of whether the file exactly matches the basename, and extension case, or is all upper case, or all lower case. The path is treated as case sensitive. This function is equivalent to **CPLFormFilename()** (p. 270) on case insensitive file systems (like Windows).

---

**Parameters:**

***pszPath*** directory path to the directory containing the file. This may be relative or absolute, and may have a trailing path separator or not. May be NULL.

***pszBaseName*** file basename. May optionally have path and/or extension. May not be NULL.

***pszExtension*** file extension, optionally including the period. May be NULL.

**Returns:**

a fully formed filename in an internal static string. Do not modify or free the returned string. The string may be destroyed by the next CPL call.

References CPLFormCIFilename(), and CPLFormFilename().

Referenced by CPLFormCIFilename().

#### 17.1.2.14 **const char\* CPLFormFilename (const char \* *pszPath*, const char \* *pszBaseName*, const char \* *pszExtension*)**

Build a full file path from a passed path, file basename and extension.

The path, and extension are optional. The basename may in fact contain an extension if desired.

```
CPLFormFilename("abc/xyz","def", ".dat" ) == "abc/xyz/def.dat"
CPLFormFilename(NULL,"def", NULL ) == "def"
CPLFormFilename(NULL,"abc/def.dat", NULL ) == "abc/def.dat"
CPLFormFilename("/abc/xyz/","def.dat", NULL ) == "/abc/xyz/def.dat"
```

**Parameters:**

***pszPath*** directory path to the directory containing the file. This may be relative or absolute, and may have a trailing path separator or not. May be NULL.

***pszBaseName*** file basename. May optionally have path and/or extension. May not be NULL.

***pszExtension*** file extension, optionally including the period. May be NULL.

**Returns:**

a fully formed filename in an internal static string. Do not modify or free the returned string. The string may be destroyed by the next CPL call.

References CPLFormFilename().

Referenced by OGRSFDriverRegistrar::AutoLoadDrivers(), CPLCorrespondingPaths(), CPLFormCIFilename(), and CPLFormFilename().

#### 17.1.2.15 **const char\* CPLGetBaseName (const char \* *pszFullFilename*)**

Extract basename (non-directory, non-extension) portion of filename.

Returns a string containing the file basename portion of the passed name. If there is no basename (passed value ends in trailing directory separator, or filename starts with a dot) an empty string is returned.

```
CPLGetBaseName( "abc/def.xyz" ) == "def"
CPLGetBaseName( "abc/def" ) == "def"
CPLGetBaseName( "abc/def/" ) == ""
```

**Parameters:**

*pszFullFilename* the full filename potentially including a path.

**Returns:**

just the non-directory, non-extension portion of the path in an internal string which must not be freed. The string may be destroyed by the next CPL filename handling call.

References CPLGetBasename().

Referenced by OGRSFDriverRegistrar::AutoLoadDrivers(), CPLCorrespondingPaths(), and CPLGetBase-name().

**17.1.2.16 char\* CPLGetCurrentDir (void)**

Get the current working directory name.

**Returns:**

a pointer to buffer, containing current working directory path or NULL in case of error. User is responsible to free that buffer after usage with CPLFree() function. If HAVE\_GETCWD macro is not defined, the function returns NULL.

References CPLGetCurrentDir().

Referenced by CPLGetCurrentDir().

**17.1.2.17 const char\* CPLGetDirname (const char \* *pszFilename*)**

Extract directory path portion of filename.

Returns a string containing the directory path portion of the passed filename. If there is no path in the passed filename the dot will be returned. It is the only difference from **CPLGetPath()** (p. 273).

```
CPLGetDirname( "abc/def.xyz" ) == "abc"
CPLGetDirname( "/abc/def/" ) == "/abc/def"
CPLGetDirname( "/" ) == "/"
CPLGetDirname( "/abc/def" ) == "/abc"
CPLGetDirname( "abc" ) == "."
```

**Parameters:**

*pszFilename* the filename potentially including a path.

**Returns:**

Path in an internal string which must not be freed. The string may be destroyed by the next CPL filename handling call. The returned will generally not contain a trailing path separator.

References CPLGetDirname().

Referenced by OGRSFDriverRegistrar::AutoLoadDrivers(), and CPLGetDirname().

---

**17.1.2.18 int CPLGetExecPath (char \* *pszPathBuf*, int *nMaxLength*)**

Fetch path of executable.

The path to the executable currently running is returned. This path includes the name of the executable. Currently this only works on win32 platform.

**Parameters:**

*pszPathBuf* the buffer into which the path is placed.

*nMaxLength* the buffer size, MAX\_PATH+1 is suggested.

**Returns:**

FALSE on failure or TRUE on success.

References CPLGetExecPath().

Referenced by OGRSFDriverRegistrar::AutoLoadDrivers(), and CPLGetExecPath().

**17.1.2.19 const char\* CPLGetExtension (const char \* *pszFullFilename*)**

Extract filename extension from full filename.

Returns a string containing the extension portion of the passed name. If there is no extension (the filename has no dot) an empty string is returned. The returned extension will not include the period.

```
CPLGetExtension( "abc/def.xyz" ) == "xyz"
CPLGetExtension( "abc/def" ) == ""
```

**Parameters:**

*pszFullFilename* the full filename potentially including a path.

**Returns:**

just the extension portion of the path in an internal string which must not be freed. The string may be destroyed by the next CPL filename handling call.

References CPLGetExtension().

Referenced by OGRSFDriverRegistrar::AutoLoadDrivers(), and CPLGetExtension().

**17.1.2.20 const char\* CPLGetFilename (const char \* *pszFullFilename*)**

Extract non-directory portion of filename.

Returns a string containing the bare filename portion of the passed filename. If there is no filename (passed value ends in trailing directory separator) an empty string is returned.

```
CPLGetFilename( "abc/def.xyz" ) == "def.xyz"
CPLGetFilename( "/abc/def/" ) == ""
CPLGetFilename( "abc/def" ) == "def"
```

**Parameters:**

*pszFullFilename* the full filename potentially including a path.

**Returns:**

just the non-directory portion of the path (points back into original string).

References CPLGetFilename().

Referenced by CPLCheckForFile(), CPLCorrespondingPaths(), and CPLGetFilename().

**17.1.2.21 const char\* CPLGetPath (const char \* *pszFilename*)**

Extract directory path portion of filename.

Returns a string containing the directory path portion of the passed filename. If there is no path in the passed filename an empty string will be returned (not NULL).

```
CPLGetPath( "abc/def.xyz" ) == "abc"
CPLGetPath( "/abc/def/" ) == "/abc/def"
CPLGetPath( "/" ) == "/"
CPLGetPath( "/abc/def" ) == "/abc"
CPLGetPath( "abc" ) == ""
```

**Parameters:**

*pszFilename* the filename potentially including a path.

**Returns:**

Path in an internal string which must not be freed. The string may be destroyed by the next CPL filename handling call. The returned will generally not contain a trailing path separator.

References CPLGetPath().

Referenced by CPLCorrespondingPaths(), CPLExtractRelativePath(), and CPLGetPath().

**17.1.2.22 CPLSharedFileInfo\* CPLGetSharedList (int \* *pnCount*)**

Fetch list of open shared files.

**Parameters:**

*pnCount* place to put the count of entries.

**Returns:**

the pointer to the first in the array of shared file info structures.

**17.1.2.23 void\* CPLGetSymbol (const char \* *pszLibrary*, const char \* *pszSymbolName*)**

Fetch a function pointer from a shared library / DLL.

---

This function is meant to abstract access to shared libraries and DLLs and performs functions similar to `dlopen()/dlsym()` on Unix and `LoadLibrary() / GetProcAddress()` on Windows.

If no support for loading entry points from a shared library is available this function will always return `NULL`. Rules on when this function issues a **CPLError()** (p. 287) or not are not currently well defined, and will have to be resolved in the future.

Currently **CPLGetSymbol()** (p. 273) doesn't try to:

- prevent the reference count on the library from going up for every request, or given any opportunity to unload the library.
- Attempt to look for the library in non-standard locations.
- Attempt to try variations on the symbol name, like pre-pending or post-pending an underscore.

Some of these issues may be worked on in the future.

#### Parameters:

***pszLibrary*** the name of the shared library or DLL containing the function. May contain path to file. If not system supplies search paths will be used.

***pszSymbolName*** the name of the function to fetch a pointer to.

#### Returns:

A pointer to the function if found, or `NULL` if the function isn't found, or the shared library can't be loaded.

References `CPLGetSymbol()`.

Referenced by `OGRSFDriverRegistrar::AutoLoadDrivers()`, and `CPLGetSymbol()`.

#### 17.1.2.24 `int CPLIsFilenameRelative (const char * pszFilename)`

Is filename relative or absolute?

The test is filesystem convention agnostic. That is it will test for Unix style and windows style path conventions regardless of the actual system in use.

#### Parameters:

***pszFilename*** the filename with path to test.

#### Returns:

`TRUE` if the filename is relative or `FALSE` if it is absolute.

References `CPLIsFilenameRelative()`.

Referenced by `CPLIsFilenameRelative()`, and `CPLProjectRelativeFilename()`.

#### 17.1.2.25 `void* CPLMalloc (size_t nSize)`

Safe version of `malloc()`.

---

This function is like the C library `malloc()`, but raises a `CE_Fatal` error with `CPL_Error()` (p. 287) if it fails to allocate the desired memory. It should be used for small memory allocations that are unlikely to fail and for which the application is unwilling to test for out of memory conditions. It uses `VSIMalloc()` to get the memory, so any hooking of `VSIMalloc()` will apply to `CPLMalloc()` (p. 274) as well. `CPLFree()` or `VSIFree()` can be used free memory allocated by `CPLMalloc()` (p. 274).

**Parameters:**

*nSize* size (in bytes) of memory block to allocate.

**Returns:**

pointer to newly allocated memory, only NULL if *nSize* is zero.

### 17.1.2.26 FILE\* CPOpenShared (const char \*pszFilename, const char \*pszAccess, int bLarge)

Open a shared file handle.

Some operating systems have limits on the number of file handles that can be open at one time. This function attempts to maintain a registry of already open file handles, and reuse existing ones if the same file is requested by another part of the application.

Note that access is only shared for access types "r", "rb", "r+" and "rb+". All others will just result in direct `VSIOpen()` calls. Keep in mind that a file is only reused if the file name is exactly the same. Different names referring to the same file will result in different handles.

The `VSIOpen()` or `VSIFOpenL()` (p. 315) function is used to actually open the file, when an existing file handle can't be shared.

**Parameters:**

*pszFilename* the name of the file to open.

*pszAccess* the normal `fopen()/VSIOpen()` style access string.

*bLarge* If TRUE `VSIFOpenL()` (p. 315) (for large files) will be used instead of `VSIOpen()`.

**Returns:**

a file handle or NULL if opening fails.

References `VSIFOpenL()`.

### 17.1.2.27 double CPLPackedDMSToDec (double dfPacked)

Convert a packed DMS value (DDDDMMSS.SS) into decimal degrees.

This function converts a packed DMS angle to seconds. The standard packed DMS format is:

degrees \* 1000000 + minutes \* 1000 + seconds

Example: `ang = 120025045.25` yields `deg = 120 min = 25 sec = 45.25`

The algorithm used for the conversion is as follows:

1. The absolute value of the angle is used.
  2. The degrees are separated out: `deg = ang/1000000` (fractional portion truncated)
  3. The minutes are separated out: `min = (ang - deg * 1000000) / 1000` (fractional portion truncated)
-

4. The seconds are then computed:  $\text{sec} = \text{ang} - \text{deg} * 1000000 - \text{min} * 1000$
5. The total angle in seconds is computed:  $\text{sec} = \text{deg} * 3600.0 + \text{min} * 60.0 + \text{sec}$
6. The sign of sec is set to that of the input angle.

Packed DMS values used by the USGS GCTP package and probably by other software.

NOTE: This code does not validate input value. If you give the wrong value, you will get the wrong result.

**Parameters:**

*dfPacked* Angle in packed DMS format.

**Returns:**

Angle in decimal degrees.

**17.1.2.28 int CPLPrintDouble (char \*pszBuffer, const char \*pszFormat, double dfValue, const char \*pszLocale)**

Print double value into specified string buffer. Exponential character flag 'E' (or 'e') will be replaced with 'D', as in Fortran. Resulting string will not to be NULL-terminated.

**Parameters:**

*pszBuffer* Pointer to the destination string buffer. Should be large enough to hold the resulting string. Note, that the string will not be NULL-terminated, so user should do this himself, if needed.

*pszFormat* Format specifier (for example, "%16.9E").

*dfValue* Numerical value to print.

*pszLocale* Pointer to a character string containing locale name ("C", "POSIX", "us\_US", "ru\_RU.KOI8-R" etc.). If NULL we will not manipulate with locale settings and current process locale will be used for printing. With the pszLocale option we can control what exact locale will be used for printing a numeric value to the string (in most cases it should be C/POSIX).

**Returns:**

Number of characters printed.

**17.1.2.29 int CPLPrintInt32 (char \*pszBuffer, GInt32 iValue, int nMaxLen)**

Print GInt32 value into specified string buffer. This string will not be NULL-terminated.

**Parameters:**

*pszBuffer* Pointer to the destination string buffer. Should be large enough to hold the resulting string. Note, that the string will not be NULL-terminated, so user should do this himself, if needed.

*iValue* Numerical value to print.

*nMaxLen* Maximum length of the resulting string. If string length is greater than nMaxLen, it will be truncated.

**Returns:**

Number of characters printed.

---

**17.1.2.30 int CPLPrintPointer (char \* *pszBuffer*, void \* *pValue*, int *nMaxLen*)**

Print pointer value into specified string buffer. This string will not be NULL-terminated.

**Parameters:**

*pszBuffer* Pointer to the destination string buffer. Should be large enough to hold the resulting string. Note, that the string will not be NULL-terminated, so user should do this himself, if needed.

*pValue* Pointer to ASCII encode.

*nMaxLen* Maximum length of the resulting string. If string length is greater than *nMaxLen*, it will be truncated.

**Returns:**

Number of characters printed.

**17.1.2.31 int CPLPrintString (char \* *pszDest*, const char \* *pszSrc*, int *nMaxLen*)**

Copy the string pointed to by *pszSrc*, NOT including the terminating “ character, to the array pointed to by *pszDest*.

**Parameters:**

*pszDest* Pointer to the destination string buffer. Should be large enough to hold the resulting string.

*pszDest* Pointer to the source buffer.

*nMaxLen* Maximum length of the resulting string. If string length is greater than *nMaxLen*, it will be truncated.

**Returns:**

Number of characters printed.

**17.1.2.32 int CPLPrintStringFill (char \* *pszDest*, const char \* *pszSrc*, int *nMaxLen*)**

Copy the string pointed to by *pszSrc*, NOT including the terminating “ character, to the array pointed to by *pszDest*. Remainder of the destination string will be filled with space characters. This is only difference from the `PrintString()`.

**Parameters:**

*pszDest* Pointer to the destination string buffer. Should be large enough to hold the resulting string.

*pszDest* Pointer to the source buffer.

*nMaxLen* Maximum length of the resulting string. If string length is greater than *nMaxLen*, it will be truncated.

**Returns:**

Number of characters printed.

---

### 17.1.2.33 **int CPLPrintTime (char \* *pszBuffer*, int *nMaxLen*, const char \* *pszFormat*, const struct tm \* *poBrokenTime*, const char \* *pszLocale*)**

Print specified time value accordingly to the format options and specified locale name. This function does following:

- if locale parameter is not NULL, the current locale setting will be stored and replaced with the specified one;
- format time value with the strftime(3) function;
- restore back current locale, if was saved.

#### **Parameters:**

***pszBuffer*** Pointer to the destination string buffer. Should be large enough to hold the resulting string. Note, that the string will not be NULL-terminated, so user should do this himself, if needed.

***nMaxLen*** Maximum length of the resulting string. If string length is greater than *nMaxLen*, it will be truncated.

***pszFormat*** Controls the output format. Options are the same as for strftime(3) function.

***poBrokenTime*** Pointer to the broken-down time structure. May be requested with the VSIGMTIME() and VSILocalTime() functions.

***pszLocale*** Pointer to a character string containing locale name ("C", "POSIX", "us\_US", "ru\_RU.KOI8-R" etc.). If NULL we will not manipulate with locale settings and current process locale will be used for printing. Be aware that it may be unsuitable to use current locale for printing time, because all names will be printed in your native language, as well as time format settings also may be adjusted differently from the C/POSIX defaults. To solve these problems this option was introduced.

#### **Returns:**

Number of characters printed.

### 17.1.2.34 **int CPLPrintUIntBig (char \* *pszBuffer*, GUIntBig *iValue*, int *nMaxLen*)**

Print GUIntBig value into specified string buffer. This string will not be NULL-terminated.

#### **Parameters:**

***pszBuffer*** Pointer to the destination string buffer. Should be large enough to hold the resulting string. Note, that the string will not be NULL-terminated, so user should do this himself, if needed.

***iValue*** Numerical value to print.

***nMaxLen*** Maximum length of the resulting string. If string length is greater than *nMaxLen*, it will be truncated.

#### **Returns:**

Number of characters printed.

---

### 17.1.2.35 **const char\* CPLProjectRelativeFilename (const char \* *pszProjectDir*, const char \* *pszSecondaryFilename*)**

Find a file relative to a project file.

Given the path to a "project" directory, and a path to a secondary file referenced from that project, build a path to the secondary file that the current application can use. If the secondary path is already absolute, rather than relative, then it will be returned unaltered.

Examples:

```
CPLProjectRelativeFilename("abc/def", "tmp/abc.gif") == "abc/def/tmp/abc.gif"
CPLProjectRelativeFilename("abc/def", "/tmp/abc.gif") == "/tmp/abc.gif"
CPLProjectRelativeFilename("/xy", "abc.gif") == "/xy/abc.gif"
CPLProjectRelativeFilename("/abc/def", "../abc.gif") == "/abc/def/../abc.gif"
CPLProjectRelativeFilename("C:\\WIN", "abc.gif") == "C:\\WIN\\abc.gif"
```

#### Parameters:

***pszProjectDir*** the directory relative to which the secondary files path should be interpreted.

***pszSecondaryFilename*** the filename (potentially with path) that is to be interpreted relative to the project directory.

#### Returns:

a composed path to the secondary file. The returned string is internal and should not be altered, freed, or depending on past the next CPL call.

References CPLIsFilenameRelative(), and CPLProjectRelativeFilename().

Referenced by CPLProjectRelativeFilename().

### 17.1.2.36 **const char\* CPLReadLine (FILE \* *fp*)**

Simplified line reading from text file.

Read a line of text from the given file handle, taking care to capture CR and/or LF and strip off ... equivalent of DKReadLine(). Pointer to an internal buffer is returned. The application shouldn't free it, or depend on it's value past the next call to **CPLReadLine()** (p. 279).

Note that **CPLReadLine()** (p. 279) uses VSIFGets(), so any hooking of VSI file services should apply to **CPLReadLine()** (p. 279) as well.

**CPLReadLine()** (p. 279) maintains an internal buffer, which will appear as a single block memory leak in some circumstances. **CPLReadLine()** (p. 279) may be called with a NULL FILE \* at any time to free this working buffer.

#### Parameters:

***fp*** file pointer opened with VSIFOpen().

#### Returns:

pointer to an internal buffer containing a line of text read from the file or NULL if the end of file was encountered.

**17.1.2.37 const char\* CPLReadLineL (FILE \*fp)**

Simplified line reading from text file.

Similar to **CPLReadLine()** (p. 279), but reading from a large file API handle.

**Parameters:**

*fp* file pointer opened with **VSIFOpenL()** (p. 315).

**Returns:**

pointer to an internal buffer containing a line of text read from the file or NULL if the end of file was encountered.

References **VSIFReadL()**, **VSIFSeekL()**, and **VSIFTellL()**.

**17.1.2.38 void\* CPLRealloc (void \*pData, size\_t nNewSize)**

Safe version of **realloc()**.

This function is like the C library **realloc()**, but raises a **CE\_Fatal** error with **CPLError()** (p. 287) if it fails to allocate the desired memory. It should be used for small memory allocations that are unlikely to fail and for which the application is unwilling to test for out of memory conditions. It uses **VSIRealloc()** to get the memory, so any hooking of **VSIRealloc()** will apply to **CPLRealloc()** (p. 280) as well. **CPLFree()** or **VSIFree()** can be used free memory allocated by **CPLRealloc()** (p. 280).

It is also safe to pass NULL in as the existing memory block for **CPLRealloc()** (p. 280), in which case it uses **VSIMalloc()** to allocate a new block.

**Parameters:**

*pData* existing memory block which should be copied to the new block.

*nNewSize* new size (in bytes) of memory block to allocate.

**Returns:**

pointer to allocated memory, only NULL if *nNewSize* is zero.

**17.1.2.39 const char\* CPLResetExtension (const char \*pszPath, const char \*pszExt)**

Replace the extension with the provided one.

**Parameters:**

*pszPath* the input path, this string is not altered.

*pszExt* the new extension to apply to the given path.

**Returns:**

an altered filename with the new extension. Do not modify or free the returned string. The string may be destroyed by the next CPL call.

References **CPLResetExtension()**.

Referenced by **CPLResetExtension()**.

---

**17.1.2.40 double CPLScanDouble (const char \* *pszString*, int *nMaxLength*)**

Extract double from string.

Scan up to a maximum number of characters from a string and convert the result to a double. This function uses **CPLAtof()** (p. 264) to convert string to double value, so it uses a comma as a decimal delimiter.

**Parameters:**

***pszString*** String containing characters to be scanned. It may be terminated with a null character.

***nMaxLength*** The maximum number of character to consider as part of the number. Less characters will be considered if a null character is encountered.

**Returns:**

Double value, converted from its ASCII form.

References CPLAtof().

**17.1.2.41 long CPLScanLong (const char \* *pszString*, int *nMaxLength*)**

Scan up to a maximum number of characters from a string and convert the result to a long.

**Parameters:**

***pszString*** String containing characters to be scanned. It may be terminated with a null character.

***nMaxLength*** The maximum number of character to consider as part of the number. Less characters will be considered if a null character is encountered.

**Returns:**

Long value, converted from its ASCII form.

**17.1.2.42 void\* CPLScanPointer (const char \* *pszString*, int *nMaxLength*)**

Extract pointer from string.

Scan up to a maximum number of characters from a string and convert the result to a pointer.

**Parameters:**

***pszString*** String containing characters to be scanned. It may be terminated with a null character.

***nMaxLength*** The maximum number of character to consider as part of the number. Less characters will be considered if a null character is encountered.

**Returns:**

pointer value, converted from its ASCII form.

---

**17.1.2.43 char\* CPLScanString (const char \* *pszString*, int *nMaxLength*, int *bTrimSpaces*, int *bNormalize*)**

Scan up to a maximum number of characters from a given string, allocate a buffer for a new string and fill it with scanned characters.

**Parameters:**

*pszString* String containing characters to be scanned. It may be terminated with a null character.

*nMaxLength* The maximum number of character to read. Less characters will be read if a null character is encountered.

*bTrimSpaces* If TRUE, trim ending spaces from the input string. Character considered as empty using isspace(3) function.

*bNormalize* If TRUE, replace ':' symbol with the '\_'. It is needed if resulting string will be used in CPL dictionaries.

**Returns:**

Pointer to the resulting string buffer. Caller responsible to free this buffer with CPLFree().

**17.1.2.44 GUIntBig CPLScanUIntBig (const char \* *pszString*, int *nMaxLength*)**

Extract big integer from string.

Scan up to a maximum number of characters from a string and convert the result to a GUIntBig.

**Parameters:**

*pszString* String containing characters to be scanned. It may be terminated with a null character.

*nMaxLength* The maximum number of character to consider as part of the number. Less characters will be considered if a null character is encountered.

**Returns:**

GUIntBig value, converted from its ASCII form.

**17.1.2.45 unsigned long CPLScanULong (const char \* *pszString*, int *nMaxLength*)**

Scan up to a maximum number of characters from a string and convert the result to a unsigned long.

**Parameters:**

*pszString* String containing characters to be scanned. It may be terminated with a null character.

*nMaxLength* The maximum number of character to consider as part of the number. Less characters will be considered if a null character is encountered.

**Returns:**

Unsigned long value, converted from its ASCII form.

---

**17.1.2.46 char\* CPLStrdup (const char \* *pszString*)**

Safe version of strdup() function.

This function is similar to the C library strdup() function, but if the memory allocation fails it will issue a CE\_Fatal error with **CPLError()** (p. 287) instead of returning NULL. It uses VSIStrdup(), so any hooking of that function will apply to **CPLStrdup()** (p. 283) as well. Memory allocated with **CPLStrdup()** (p. 283) can be freed with CPLFree() or VSIFree().

It is also safe to pass a NULL string into **CPLStrdup()** (p. 283). **CPLStrdup()** (p. 283) will allocate and return a zero length string (as opposed to a NULL string).

**Parameters:**

*pszString* input string to be duplicated. May be NULL.

**Returns:**

pointer to a newly allocated copy of the string. Free with CPLFree() or VSIFree().

**17.1.2.47 char\* CPLStrlwr (char \* *pszString*)**

Convert each characters of the string to lower case.

For example, "ABcdE" will be converted to "abcde". This function is locale dependent.

**Parameters:**

*pszString* input string to be converted.

**Returns:**

pointer to the same string, *pszString*.

**17.1.2.48 double CPLStrtod (const char \* *nptr*, char \*\* *endptr*)**

Converts ASCII string to floating point number.

This function converts the initial portion of the string pointed to by *nptr* to double floating point representation. This function does the same as standard strtod(3), but does not take locale in account. That means, the decimal delimiter is always '.' (decimal point). Use **CPLStrtodDelim()** (p. 284) function if you want to specify custom delimiter. Also see notes for **CPLAtof()** (p. 264) function.

**Parameters:**

*nptr* Pointer to string to convert.

*endptr* If is not NULL, a pointer to the character after the last character used in the conversion is stored in the location referenced by *endptr*.

**Returns:**

Converted value, if any.

References CPLStrtod(), and CPLStrtodDelim().

Referenced by CPLAtof(), and CPLStrtod().

---

**17.1.2.49 double CPLStrtodDelim (const char \* *nptr*, char \*\* *endptr*, char *point*)**

Converts ASCII string to floating point number using specified delimiter.

This function converts the initial portion of the string pointed to by *nptr* to double floating point representation. This function does the same as standard `strtod(3)`, but does not take locale in account. Instead of locale defined decimal delimiter you can specify your own one. Also see notes for **CPLAtof()** (p. 264) function.

**Parameters:**

*nptr* Pointer to string to convert.

*endptr* If is not NULL, a pointer to the character after the last character used in the conversion is stored in the location referenced by *endptr*.

*point* Decimal delimiter.

**Returns:**

Converted value, if any.

References `CPLStrtodDelim()`.

Referenced by `CPLAtofDelim()`, `CPLAtofM()`, `CPLStrtod()`, `CPLStrtodDelim()`, and `CPLStrtofDelim()`.

**17.1.2.50 float CPLStrtof (const char \* *nptr*, char \*\* *endptr*)**

Converts ASCII string to floating point number.

This function converts the initial portion of the string pointed to by *nptr* to single floating point representation. This function does the same as standard `strtof(3)`, but does not take locale in account. That means, the decimal delimiter is always '.' (decimal point). Use **CPLStrtofDelim()** (p. 284) function if you want to specify custom delimiter. Also see notes for **CPLAtof()** (p. 264) function.

**Parameters:**

*nptr* Pointer to string to convert.

*endptr* If is not NULL, a pointer to the character after the last character used in the conversion is stored in the location referenced by *endptr*.

**Returns:**

Converted value, if any.

References `CPLStrtof()`, and `CPLStrtofDelim()`.

Referenced by `CPLStrtof()`.

**17.1.2.51 float CPLStrtofDelim (const char \* *nptr*, char \*\* *endptr*, char *point*)**

Converts ASCII string to floating point number using specified delimiter.

This function converts the initial portion of the string pointed to by *nptr* to single floating point representation. This function does the same as standard `strtof(3)`, but does not take locale in account. Instead of locale defined decimal delimiter you can specify your own one. Also see notes for **CPLAtof()** (p. 264) function.

---

**Parameters:**

*nptr* Pointer to string to convert.

*endptr* If is not NULL, a pointer to the character after the last character used in the conversion is stored in the location referenced by endptr.

*point* Decimal delimiter.

**Returns:**

Converted value, if any.

References CPLStrtodDelim(), and CPLStrtofDelim().

Referenced by CPLStrtof(), and CPLStrtofDelim().

---

## 17.2 cpl\_error.h File Reference

```
#include "cpl_port.h"
```

### Functions

- void **CPL****Error** (CPLerr eErrClass, int err\_no, const char \*fmt,...)
- void **CPL****ErrorReset** (void)
- int **CPL****GetLastErrorNo** (void)
- CPLerr **CPL****GetLastErrorType** (void)
- const char \* **CPL****GetLastErrorMsg** (void)
- CPLErrorHandler **CPL****SetErrorHandler** (CPLErrorHandler)
- void **CPL****PushErrorHandler** (CPLErrorHandler)
- void **CPL****PopErrorHandler** (void)
- void **CPL****Debug** (const char \*, const char \*,...)
- void **\_CPL****Assert** (const char \*, const char \*, int)

### 17.2.1 Detailed Description

CPL error handling services.

### 17.2.2 Function Documentation

#### 17.2.2.1 void **\_CPL****Assert** (const char \* *pszExpression*, const char \* *pszFile*, int *iLine*)

Report failure of a logical assertion.

Applications would normally use the **CPL****Assert**() macro which expands into code calling **\_CPL****Assert**() (p. 286) only if the condition fails. **\_CPL****Assert**() (p. 286) will generate a CE\_Fatal error call to **CPL****Error**() (p. 287), indicating the file name, and line number of the failed assertion, as well as containing the assertion itself.

There is no reason for application code to call **\_CPL****Assert**() (p. 286) directly.

#### 17.2.2.2 void **CPL****Debug** (const char \* *pszCategory*, const char \* *pszFormat*, ...)

Display a debugging message.

The category argument is used in conjunction with the **CPL**\_DEBUG environment variable to establish if the message should be displayed. If the **CPL**\_DEBUG environment variable is not set, no debug messages are emitted (use **CPL****Error**(CE\_Warning,...) to ensure messages are displayed). If **CPL**\_DEBUG is set, but is an empty string or the word "ON" then all debug messages are shown. Otherwise only messages whose category appears somewhere within the **CPL**\_DEBUG value are displayed (as determined by strstr()).

Categories are usually an identifier for the subsystem producing the error. For instance "GDAL" might be used for the GDAL core, and "TIFF" for messages from the TIFF translator.

#### Parameters:

*pszCategory* name of the debugging message category.

*pszFormat* printf() style format string for message to display. Remaining arguments are assumed to be for format.

### 17.2.2.3 void CPLError (CPLErr *eErrClass*, int *err\_no*, const char \**fmt*, ...)

Report an error.

This function reports an error in a manner that can be hooked and reported appropriate by different applications.

The effect of this function can be altered by applications by installing a custom error handling using **CPLSetErrorHandler()** (p. 288).

The *eErrClass* argument can have the value `CE_Warning` indicating that the message is an informational warning, `CE_Failure` indicating that the action failed, but that normal recover mechanisms will be used or `CE_Fatal` meaning that a fatal error has occurred, and that **CPLError()** (p. 287) should not return.

The default behaviour of **CPLError()** (p. 287) is to report errors to stderr, and to abort() after reporting a `CE_Fatal` error. It is expected that some applications will want to suppress error reporting, and will want to install a C++ exception, or longjmp() approach to no local fatal error recovery.

Regardless of how application error handlers or the default error handler choose to handle an error, the error number, and message will be stored for recovery with **CPLGetLastErrorNo()** (p. 287) and **CPLGetLastErrorMsg()** (p. 287).

#### Parameters:

*eErrClass* one of `CE_Warning`, `CE_Failure` or `CE_Fatal`.

*err\_no* the error number (`CPLE_*`) from **cpl\_error.h** (p. 286).

*fmt* a printf() style format string. Any additional arguments will be treated as arguments to fill in this format in a manner similar to printf().

### 17.2.2.4 void CPLErrorReset (void)

Erase any traces of previous errors.

This is normally used to ensure that an error which has been recovered from does not appear to be still in play with high level functions.

### 17.2.2.5 const char\* CPLGetLastErrorMsg (void)

Get the last error message.

Fetches the last error message posted with **CPLError()** (p. 287), that hasn't been cleared by **CPLErrorReset()** (p. 287). The returned pointer is to an internal string that should not be altered or freed.

#### Returns:

the last error message, or NULL if there is no posted error message.

### 17.2.2.6 int CPLGetLastErrorNo (void)

Fetch the last error number.

This is the error number, not the error class.

#### Returns:

the error number of the last error to occur, or `CPLE_None` (0) if there are no posted errors.

---

**17.2.2.7 CPLerr CPLGetLastErrorType (void)**

Fetch the last error type.

This is the error class, not the error number.

**Returns:**

the error number of the last error to occur, or CE\_None (0) if there are no posted errors.

**17.2.2.8 void CPLPopErrorHandler (void)**

Pop error handler off stack.

Discards the current error handler on the error handler stack, and restores the one in use before the last **CPLPushErrorHandler()** (p. 288) call. This method has no effect if there are no error handlers on the current threads error handler stack.

**17.2.2.9 void CPLPushErrorHandler (CPLErrorHandler *pfnErrorHandlerNew*)**

Push a new CPLError handler.

This pushes a new error handler on the thread-local error handler stack. This handler will be used until removed with **CPLPopErrorHandler()** (p. 288).

The **CPLSetErrorHandler()** (p. 288) docs have further information on how CPLError handlers work.

**Parameters:**

*pfnErrorHandlerNew* new error handler function.

**17.2.2.10 CPLErrorHandler CPLSetErrorHandler (CPLErrorHandler *pfnErrorHandlerNew*)**

Install custom error handler.

Allow the library's user to specify his own error handler function. A valid error handler is a C function with the following prototype:

```
void MyErrorHandler(CPLerr eErrClass, int err_no, const char *msg)
```

Pass NULL to come back to the default behavior. The default behaviour (CPLDefaultErrorHandler()) is to write the message to stderr.

The msg will be a partially formatted error message not containing the "ERROR %d:" portion emitted by the default handler. Message formatting is handled by **CPLFormatError()** (p. 287) before calling the handler. If the error handler function is passed a CE\_Fatal class error and returns, then **CPLFormatError()** (p. 287) will call abort(). Applications wanting to interrupt this fatal behaviour will have to use longjmp(), or a C++ exception to indirectly exit the function.

Another standard error handler is CPLQuietErrorHandler() which doesn't make any attempt to report the passed error or warning messages but will process debug messages via CPLDefaultErrorHandler.

Note that error handlers set with **CPLSetErrorHandler()** (p. 288) apply to all threads in an application, while error handlers set with CPLPushErrorHandler are thread-local. However, any error handlers pushed

with `CPLPushErrorHandler` (and not removed with `CPLPopErrorHandler`) take precedence over the global error handlers set with **`CPLSetErrorHandler()`** (p. 288). Generally speaking **`CPLSetErrorHandler()`** (p. 288) would be used to set a desired global error handler, while **`CPLPushErrorHandler()`** (p. 288) would be used to install a temporary local error handler, such as `CPLQuietErrorHandler()` to suppress error reporting in a limited segment of code.

**Parameters:**

***`pfnErrorHandlerNew`*** new error handler function.

**Returns:**

returns the previously installed error handler.

## 17.3 cpl\_list.h File Reference

```
#include "cpl_port.h"
```

### Classes

- struct **\_CPLList**

### Typedefs

- typedef struct **\_CPLList** **CPLList**

### Functions

- **CPLList \* CPLListAppend** (**CPLList** \*psList, void \*pData)
- **CPLList \* CPLListInsert** (**CPLList** \*psList, void \*pData, int nPosition)
- **CPLList \* CPLListGetLast** (**CPLList** \*psList)
- **CPLList \* CPLListGet** (**CPLList** \*psList, int nPosition)
- **int CPLListCount** (**CPLList** \*psList)
- **CPLList \* CPLListRemove** (**CPLList** \*psList, int nPosition)
- **void CPLListDestroy** (**CPLList** \*psList)
- **CPLList \* CPLListGetNext** (**CPLList** \*psElement)
- **void \* CPLListGetData** (**CPLList** \*psElement)

#### 17.3.1 Detailed Description

Simplest list implementation. List contains only pointers to stored objects, not objects itself. All operations regarding allocation and freeing memory for objects should be performed by the caller.

#### 17.3.2 Typedef Documentation

##### 17.3.2.1 typedef struct **\_CPLList** **CPLList**

List element structure.

#### 17.3.3 Function Documentation

##### 17.3.3.1 **CPLList\*** **CPLListAppend** (**CPLList** \* *psList*, void \* *pData*)

Append an object list and return a pointer to the modified list. If the input list is NULL, then a new list is created.

##### Parameters:

*psList* pointer to list head.

*pData* pointer to inserted data object. May be NULL.

---

**Returns:**

pointer to the head of modified list.

References `_CPLList::pData`, and `_CPLList::pNext`.

**17.3.3.2 int CPLListCount (CPLList \* *psList*)**

Return the number of elements in a list.

**Parameters:**

*psList* pointer to list head.

**Returns:**

number of elements in a list.

References `_CPLList::pNext`.

**17.3.3.3 void CPLListDestroy (CPLList \* *psList*)**

Destroy a list. Caller responsible for freeing data objects contained in list elements.

**Parameters:**

*psList* pointer to list head.

References `_CPLList::pNext`.

**17.3.3.4 CPLList\* CPLListGet (CPLList \* *psList*, int *nPosition*)**

Return the pointer to the specified element in a list.

**Parameters:**

*psList* pointer to list head.

**Returns:**

pointer to the specified element in a list.

References `_CPLList::pNext`.

**17.3.3.5 void\* CPLListGetData (CPLList \* *psElement*)**

Return pointer to the data object contained in given list element.

**Parameters:**

*psElement* pointer to list element.

**Returns:**

pointer to the data object contained in given list element.

References `_CPLList::pData`.

---

**17.3.3.6 CPLList\* CPLListGetLast (CPLList \* *psList*)**

Return the pointer to last element in a list.

**Parameters:**

*psList* pointer to list head.

**Returns:**

pointer to last element in a list.

References \_CPLList::psNext.

**17.3.3.7 CPLList\* CPLListGetNext (CPLList \* *psElement*)**

Return the pointer to next element in a list.

**Parameters:**

*psElement* pointer to list element.

**Returns:**

pointer to the list element preceded by the given element.

References \_CPLList::psNext.

**17.3.3.8 CPLList\* CPLListInsert (CPLList \* *psList*, void \* *pData*, int *nPosition*)**

Insert an object into list at specified position (zero based). If the input list is NULL, then a new list is created.

**Parameters:**

*psList* pointer to list head.

*pData* pointer to inserted data object. May be NULL.

*nPosition* position number to insert an object.

**Returns:**

pointer to the head of modified list.

References \_CPLList::pData, and \_CPLList::psNext.

**17.3.3.9 CPLList\* CPLListRemove (CPLList \* *psList*, int *nPosition*)**

Remove the element from the specified position (zero based) in a list. Data object contained in removed element must be freed by the caller first.

**Parameters:**

*psList* pointer to list head.

---

*nPosition* position number to delet an element.

**Returns:**

pointer to the head of modified list.

References \_CPLList::psNext.

## 17.4 cpl\_minixml.h File Reference

```
#include "cpl_port.h"
```

### Classes

- struct **CPLXMLNode**

### Enumerations

- enum **CPLXMLNodeType** {  
    **CXT\_Element** = 0, **CXT\_Text** = 1, **CXT\_Attribute** = 2, **CXT\_Comment** = 3,  
    **CXT\_Literal** = 4 }

### Functions

- **CPLXMLNode \* CPLParseXMLString** (const char \*)  
*Parse an XML string into tree form.*
  - void **CPLDestroyXMLNode** (**CPLXMLNode** \*)  
*Destroy a tree.*
  - **CPLXMLNode \* CPLGetXMLNode** (**CPLXMLNode** \*poRoot, const char \*pszPath)  
*Find node by path.*
  - **CPLXMLNode \* CPLSearchXMLNode** (**CPLXMLNode** \*poRoot, const char \*pszTarget)  
*Search for a node in document.*
  - const char \* **CPLGetXMLValue** (**CPLXMLNode** \*poRoot, const char \*pszPath, const char \*pszDefault)  
*Fetch element/attribute value.*
  - **CPLXMLNode \* CPLCreateXMLNode** (**CPLXMLNode** \*poParent, **CPLXMLNodeType** eType, const char \*pszText)  
*Create an document tree item.*
  - char \* **CPLSerializeXMLTree** (**CPLXMLNode** \*psNode)  
*Convert tree into string document.*
  - void **CPLAddXMLChild** (**CPLXMLNode** \*psParent, **CPLXMLNode** \*psChild)  
*Add child node to parent.*
  - int **CPLRemoveXMLChild** (**CPLXMLNode** \*psParent, **CPLXMLNode** \*psChild)  
*Remove child node from parent.*
  - void **CPLAddXMLSibling** (**CPLXMLNode** \*psOlderSibling, **CPLXMLNode** \*psNewSibling)  
*Add new sibling.*
-

- **CPLXMLNode \* CPLCreateXMLElementAndValue** (CPLXMLNode \*psParent, const char \*pszName, const char \*pszValue)  
*Create an element and text value.*
- **CPLXMLNode \* CPLCloneXMLTree** (CPLXMLNode \*psTree)  
*Copy tree.*
- **int CPLSetXMLValue** (CPLXMLNode \*psRoot, const char \*pszPath, const char \*pszValue)  
*Set element value by path.*
- **void CPLStripXMLNamespace** (CPLXMLNode \*psRoot, const char \*pszNamespace, int bRecurse)  
*Strip indicated namespaces.*
- **void CPLCleanXMLElementName** (char \*)  
*Make string into safe XML token.*
- **CPLXMLNode \* CPLParseXMLFile** (const char \*pszFilename)  
*Parse XML file into tree.*
- **int CPLSerializeXMLTreeToFile** (CPLXMLNode \*psTree, const char \*pszFilename)  
*Write document tree to a file.*

### 17.4.1 Detailed Description

Definitions for CPL mini XML Parser/Serializer.

### 17.4.2 Enumeration Type Documentation

#### 17.4.2.1 enum CPLXMLNodeType

**Enumerator:**

**CXT\_Element** Node is an element  
**CXT\_Text** Node is a raw text value  
**CXT\_Attribute** Node is attribute  
**CXT\_Comment** Node is an XML comment.  
**CXT\_Literal** Node is a special literal

### 17.4.3 Function Documentation

#### 17.4.3.1 void CPLAddXMLChild (CPLXMLNode \* psParent, CPLXMLNode \* psChild)

Add child node to parent.

The passed child is added to the list of children of the indicated parent. Normally the child is added at the end of the parents child list, but attributes (CXT\_Attribute) will be inserted after any other attributes but before any other element type. Ownership of the child node is effectively assumed by the parent node. If the child has siblings (it's psNext is not NULL) they will be trimmed, but if the child has children they are carried with it.

---

**Parameters:**

*psParent* the node to attach the child to. May not be NULL.

*psChild* the child to add to the parent. May not be NULL. Should not be a child of any other parent.

References CXT\_Attribute, CPLXMLNode::eType, CPLXMLNode::psChild, and CPLXMLNode::psNext.

**17.4.3.2 void CPLAddXMLSibling (CPLXMLNode \* *psOlderSibling*, CPLXMLNode \* *psNewSibling*)**

Add new sibling.

The passed *psNewSibling* is added to the end of siblings of the *psOlderSibling* node. That is, it is added to the end of the *psNext* chain. There is no special handling if *psNewSibling* is an attribute. If this is required, use **CPLAddXMLChild()** (p. 295).

**Parameters:**

*psOlderSibling* the node to attach the sibling after.

*psNewSibling* the node to add at the end of *psOlderSibling*'s *psNext* chain.

References CPLXMLNode::psNext.

**17.4.3.3 void CPLCleanXMLElementName (char \* *pszTarget*)**

Make string into safe XML token.

Modifies a string in place to try and make it into a legal XML token that can be used as an element name. This is accomplished by changing any characters not legal in a token into an underscore.

NOTE: This function should implement the rules in section 2.3 of <http://www.w3.org/TR/xml11/> but it doesn't yet do that properly. We only do a rough approximation of that.

**Parameters:**

*pszTarget* the string to be adjusted. It is altered in place.

**17.4.3.4 CPLXMLNode\* CPLCloneXMLTree (CPLXMLNode \* *psTree*)**

Copy tree.

Creates a deep copy of a **CPLXMLNode** (p. 77) tree.

**Parameters:**

*psTree* the tree to duplicate.

**Returns:**

a copy of the whole tree.

References CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

---

### 17.4.3.5 **CPLXMLNode\* CPLCreateXMLElementAndValue** (CPLXMLNode \* *psParent*, const char \* *pszName*, const char \* *pszValue*)

Create an element and text value.

This function is a convenient short form for:

```
CPLXMLNode *psTextNode;
CPLXMLNode *psElementNode;

psElementNode = CPLCreateXMLNode( psParent, CXT_Element, pszName );
psTextNode = CPLCreateXMLNode( psElementNode, CXT_Text, pszValue );

return psElementNode;
```

It creates a CXT\_Element node, with a CXT\_Text child, and attaches the element to the passed parent.

#### Parameters:

*psParent* the parent node to which the resulting node should be attached. May be NULL to keep as freestanding.

*pszName* the element name to create.

*pszValue* the text to attach to the element. Must not be NULL.

#### Returns:

the pointer to the new element node.

References CXT\_Element, and CXT\_Text.

### 17.4.3.6 **CPLXMLNode\* CPLCreateXMLNode** (CPLXMLNode \* *poParent*, CPLXMLNodeType *eType*, const char \* *pszText*)

Create an document tree item.

Create a single **CPLXMLNode** (p. 77) object with the desired value and type, and attach it as a child of the indicated parent.

#### Parameters:

*poParent* the parent to which this node should be attached as a child. May be NULL to keep as free standing.

#### Returns:

the newly created node, now owned by the caller (or parent node).

References CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

### 17.4.3.7 **void CPLDestroyXMLNode** (CPLXMLNode \* *psNode*)

Destroy a tree.

This function frees resources associated with a **CPLXMLNode** (p. 77) and all its children nodes.

---

**Parameters:**

*psNode* the tree to free.

References CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

**17.4.3.8 CPLXMLNode\* CPLGetXMLNode (CPLXMLNode \* *psRoot*, const char \* *pszPath*)**

Find node by path.

Searches the document or subdocument indicated by psRoot for an element (or attribute) with the given path. The path should consist of a set of element names separated by dots, not including the name of the root element (psRoot). If the requested element is not found NULL is returned.

Attribute names may only appear as the last item in the path.

The search is done from the root nodes children, but all intermediate nodes in the path must be specified. Searching for "name" would only find a name element or attribute if it is a direct child of the root, not at any level in the subdocument.

If the pszPath is prefixed by "=" then the search will begin with the root node, and it's siblings, instead of the root nodes children. This is particularly useful when searching within a whole document which is often prefixed by one or more "junk" nodes like the <?xml> declaration.

**Parameters:**

*psRoot* the subtree in which to search. This should be a node of type CXT\_Element. NULL is safe.

*pszPath* the list of element names in the path (dot separated).

**Returns:**

the requested element node, or NULL if not found.

References CXT\_Text, CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

**17.4.3.9 const char\* CPLGetXMLValue (CPLXMLNode \* *psRoot*, const char \* *pszPath*, const char \* *pszDefault*)**

Fetch element/attribute value.

Searches the document for the element/attribute value associated with the path. The corresponding node is internally found with **CPLGetXMLNode()** (p. 298) (see there for details on path handling). Once found, the value is considered to be the first CXT\_Text child of the node.

If the attribute/element search fails, or if the found node has not value then the passed default value is returned.

The returned value points to memory within the document tree, and should not be altered or freed.

**Parameters:**

*psRoot* the subtree in which to search. This should be a node of type CXT\_Element. NULL is safe.

*pszPath* the list of element names in the path (dot separated). An empty path means get the value of the psRoot node.

*pszDefault* the value to return if a corresponding value is not found, may be NULL.

**Returns:**

the requested value or pszDefault if not found.

References CXT\_Attribute, CXT\_Element, CXT\_Text, CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

**17.4.3.10 CPLXMLNode\* CPLParseXMLFile (const char \* *pszFilename*)**

Parse XML file into tree.

The named file is opened, loaded into memory as a big string, and parsed with **CPLParseXMLString()** (p. 299). Errors in reading the file or parsing the XML will be reported by **CPLError()** (p. 287).

The "large file" API is used, so XML files can come from virtualized files.

**Parameters:**

*pszFilename* the file to open.

**Returns:**

NULL on failure, or the document tree on success.

References VSIFCloseL(), VSIFOpenL(), VSIFReadL(), VSIFSeekL(), and VSIFTellL().

**17.4.3.11 CPLXMLNode\* CPLParseXMLString (const char \* *pszString*)**

Parse an XML string into tree form.

The passed document is parsed into a **CPLXMLNode** (p. 77) tree representation. If the document is not well formed XML then NULL is returned, and errors are reported via **CPLError()** (p. 287). No validation beyond wellformedness is done. The **CPLParseXMLFile()** (p. 299) convenience function can be used to parse from a file.

The returned document tree is owned by the caller and should be freed with **CPLDestroyXMLNode()** (p. 297) when no longer needed.

If the document has more than one "root level" element then those after the first will be attached to the first as siblings (via the psNext pointers) even though there is no common parent. A document with no XML structure (no angle brackets for instance) would be considered well formed, and returned as a single CXT\_Text node.

**Parameters:**

*pszString* the document to parse.

**Returns:**

parsed tree or NULL on error.

References CXT\_Attribute, CXT\_Comment, CXT\_Element, CXT\_Literal, CXT\_Text, and CPLXMLNode::pszValue.

---

**17.4.3.12 int CPLRemoveXMLChild (CPLXMLNode \* *psParent*, CPLXMLNode \* *psChild*)**

Remove child node from parent.

The passed child is removed from the child list of the passed parent, but the child is not destroyed. The child retains ownership of it's own children, but is cleanly removed from the child list of the parent.

**Parameters:**

*psParent* the node to the child is attached to.

*psChild* the child to remove.

**Returns:**

TRUE on success or FALSE if the child was not found.

References CPLXMLNode::psChild, and CPLXMLNode::psNext.

**17.4.3.13 CPLXMLNode\* CPLSearchXMLNode (CPLXMLNode \* *psRoot*, const char \* *pszElement*)**

Search for a node in document.

Searches the children (and potentially siblings) of the documented passed in for the named element or attribute. To search following siblings as well as children, prefix the pszElement name with an equal sign. This function does an in-order traversal of the document tree. So it will first match against the current node, then it's first child, that child's first child, and so on.

Use **CPLGetXMLNode()** (p. 298) to find a specific child, or along a specific node path.

**Parameters:**

*psRoot* the subtree to search. This should be a node of type CXT\_Element. NULL is safe.

*pszElement* the name of the element or attribute to search for.

**Returns:**

The matching node or NULL on failure.

References CXT\_Attribute, CXT\_Element, CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

**17.4.3.14 char\* CPLSerializeXMLTree (CPLXMLNode \* *psNode*)**

Convert tree into string document.

This function converts a **CPLXMLNode** (p. 77) tree representation of a document into a flat string representation. White space indentation is used visually preserve the tree structure of the document. The returned document becomes owned by the caller and should be freed with CPLFree() when no longer needed.

**Parameters:**

*psNode*

---

**Returns:**

the document on success or NULL on failure.

References CPLXMLNode::psNext.

**17.4.3.15 int CPLSerializeXMLTreeToFile (CPLXMLNode \* *psTree*, const char \* *pszFilename*)**

Write document tree to a file.

The passed document tree is converted into one big string (with **CPLSerializeXMLTree()** (p. 300)) and then written to the named file. Errors writing the file will be reported by **CPL\_Error()** (p. 287). The source document tree is not altered. If the output file already exists it will be overwritten.

**Parameters:**

*psTree* the document tree to write.

*pszFilename* the name of the file to write to.

**Returns:**

TRUE on success, FALSE otherwise.

References VSIFCloseL(), VSIFOpenL(), and VSIFWriteL().

**17.4.3.16 int CPLSetXMLValue (CPLXMLNode \* *psRoot*, const char \* *pszPath*, const char \* *pszValue*)**

Set element value by path.

Find (or create) the target element or attribute specified in the path, and assign it the indicated value.

Any path elements that do not already exist will be created. The target nodes value (the first CXT\_Text child) will be replaced with the provided value.

If the target node is an attribute instead of an element, the last separator should be a "#" instead of the normal period path separator.

Example: CPLSetXMLValue( "Citation.Id.Description", "DOQ dataset" ); CPLSetXMLValue( "Citation.Id.Description#name", "doq" );

**Parameters:**

*psRoot* the subdocument to be updated.

*pszPath* the dot seperated path to the target element/attribute.

*pszValue* the text value to assign.

**Returns:**

TRUE on success.

References CXT\_Attribute, CXT\_Element, CXT\_Text, CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

---

### 17.4.3.17 void CPLStripXMLNamespace (CPLXMLNode \* *psRoot*, const char \* *pszNamespace*, int *bRecurse*)

Strip indicated namespaces.

The subdocument (*psRoot*) is recursively examined, and any elements with the indicated namespace prefix will have the namespace prefix stripped from the element names. If the passed namespace is NULL, then all namespace prefixes will be stripped.

Nodes other than elements should remain unaffected. The changes are made "in place", and should not alter any node locations, only the *pszValue* field of affected nodes.

#### Parameters:

*psRoot* the document to operate on.

*pszNamespace* the name space prefix (not including colon), or NULL.

*bRecurse* TRUE to recurse over whole document, or FALSE to only operate on the passed node.

References CXT\_Attribute, CXT\_Element, CPLXMLNode::eType, CPLXMLNode::psChild, CPLXMLNode::psNext, and CPLXMLNode::pszValue.

---

## 17.5 cpl\_odbc.h File Reference

```
#include "cpl_port.h"
#include <sql.h>
#include <sqlext.h>
#include <odbcinst.h>
#include "cpl_string.h"
```

### Classes

- class **CPODBCDriverInstaller**
- class **CPODBCSession**
- class **CPODBCStatement**

### 17.5.1 Detailed Description

ODBC Abstraction Layer (C++).

## 17.6 cpl\_port.h File Reference

```
#include "cpl_config.h"
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#include <stdarg.h>
#include <string.h>
#include <ctype.h>
#include <limits.h>
#include <time.h>
#include <errno.h>
#include <locale.h>
```

### 17.6.1 Detailed Description

Core portability definitions for CPL.

## 17.7 cpl\_string.h File Reference

```
#include "cpl_vsi.h"
#include "cpl_error.h"
#include "cpl_conv.h"
#include <string>
```

### Classes

- class **CPLString**

### Functions

- int **CSLCount** (char \*\*papszStrList)
- void **CSLDestroy** (char \*\*papszStrList)
- char \*\* **CSLDuplicate** (char \*\*papszStrList)
- char \*\* **CSLMerge** (char \*\*papszOrig, char \*\*papszOverride)  
*Merge two lists.*
- char \*\* **CSLTokenizeString2** (const char \*pszString, const char \*pszDelimiter, int nCSLTFlags)
- char \*\* **CSLLoad** (const char \*pszFname)
- int **CSLFindString** (char \*\*, const char \*)
- int **CSLPartialFindString** (char \*\*papszHaystack, const char \*pszNeedle)
- int **CSLTestBoolean** (const char \*pszValue)
- const char \* **CPLParseNameValue** (const char \*pszNameValue, char \*\*ppszKey)
- char \*\* **CSLSetNameValue** (char \*\*papszStrList, const char \*pszName, const char \*pszValue)
- void **CSLSetNameValueSeparator** (char \*\*papszStrList, const char \*pszSeparator)
- char \* **CPLEscapeString** (const char \*pszString, int nLength, int nScheme)
- char \* **CPLUnescapeString** (const char \*pszString, int \*pnLength, int nScheme)
- char \* **CPLBinaryToHex** (int nBytes, const GByte \*pabyData)
- GByte \* **CPLHexToBinary** (const char \*pszHex, int \*pnBytes)

### 17.7.1 Detailed Description

Various convenience functions for working with strings and string lists.

A StringList is just an array of strings with the last pointer being NULL. An empty StringList may be either a NULL pointer, or a pointer to a pointer memory location with a NULL value.

A common convention for StringLists is to use them to store name/value lists. In this case the contents are treated like a dictionary of name/value pairs. The actual data is formatted with each string having the format "<name>:<value>" (though "=" is also an acceptable separator). A number of the functions in the file operate on name/value style string lists (such as **CSLSetNameValue**() (p. 310), and **CSLFetchNameValue**()).

---

## 17.7.2 Function Documentation

### 17.7.2.1 `char* CPLBinaryToHex (int nBytes, const GByte * pabyData)`

Binary to hexadecimal translation.

**Parameters:**

*nBytes* number of bytes of binary data in *pabyData*.

*pabyData* array of data bytes to translate.

**Returns:**

hexadecimal translation, zero terminated. Free with `CPLFree()`.

### 17.7.2.2 `char* CPLEscapeString (const char * pszInput, int nLength, int nScheme)`

Apply escaping to string to preserve special characters.

This function will "escape" a variety of special characters to make the string suitable to embed within a string constant or to write within a text stream but in a form that can be reconstituted to its original form. The escaping will even preserve zero bytes allowing preservation of raw binary data.

`CPLES_BackslashQuotable(0)`: This scheme turns a binary string into a form suitable to be placed within double quotes as a string constant. The backslash, quote, " and newline characters are all escaped in the usual C style.

`CPLES_XML(1)`: This scheme converts the '<', '>' and '&' characters into their XML/HTML equivalent (>, < and &) making a string safe to embed as CDATA within an XML element. The " is not escaped and should not be included in the input.

`CPLES_URL(2)`: Everything except alphanumerics and the underscore are converted to a percent followed by a two digit hex encoding of the character (leading zero supplied if needed). This is the mechanism used for encoding values to be passed in URLs.

`CPLES_SQL(3)`: All single quotes are replaced with two single quotes. Suitable for use when constructing literal values for SQL commands where the literal will be enclosed in single quotes.

`CPLES_CSV(4)`: If the values contains commas, double quotes, or newlines it placed in double quotes, and double quotes in the value are doubled. Suitable for use when constructing field values for .csv files. Note that `CPLUnescapeString()` (p. 307) currently does not support this format, only `CPLEscapeString()` (p. 306). See `cpl_csv.cpp` for csv parsing support.

**Parameters:**

*pszInput* the string to escape.

*nLength* The number of bytes of data to preserve. If this is -1 the `strlen(pszString)` function will be used to compute the length.

*nScheme* the encoding scheme to use.

**Returns:**

an escaped, zero terminated string that should be freed with `CPLFree()` when no longer needed.

---

### 17.7.2.3 GByte\* CPLHexToBinary (const char \* *pszHex*, int \* *pnBytes*)

Hexadecimal to binary translation

**Parameters:**

*pszHex* the input hex encoded string.

*pnBytes* the returned count of decoded bytes placed here.

**Returns:**

returns binary buffer of data - free with CPLFree().

### 17.7.2.4 const char\* CPLParseNameValue (const char \* *pszNameValue*, char \*\* *ppszKey*)

Parse NAME=VALUE string into name and value components.

Note that if *ppszKey* is non-NULL, the key (or name) portion will be allocated using VSIMalloc(), and returned in that pointer. It is the applications responsibility to free this string, but the application should not modify or free the returned value portion.

This function also support "NAME:VALUE" strings and will strip white space from around the delimiter when forming name and value strings.

Eventually CSLFetchNameValue() and friends may be modified to use **CPLParseNameValue()** (p. 307).

**Parameters:**

*pszNameValue* string in "NAME=VALUE" format.

*ppszKey* optional pointer though which to return the name portion.

**Returns:**

the value portion (pointing into original string).

### 17.7.2.5 char\* CPLUnescapeString (const char \* *pszInput*, int \* *pnLength*, int *nScheme*)

Unescape a string.

This function does the opposite of **CPLEscapeString()** (p. 306). Given a string with special values escaped according to some scheme, it will return a new copy of the string returned to it's original form.

**Parameters:**

*pszInput* the input string. This is a zero terminated string.

*pnLength* location to return the length of the unescaped string, which may in some cases include embedded " characters.

*nScheme* the escaped scheme to undo (see **CPLEscapeString()** (p. 306) for a list).

**Returns:**

a copy of the unescaped string that should be freed by the application using CPLFree() when no longer needed.

---

**17.7.2.6 int CSLCount (char \*\* *papszStrList*)**

Return number of items in a string list.

Returns the number of items in a string list, not counting the terminating NULL. Passing in NULL is safe, and will result in a count of zero.

Lists are counted by iterating through them so long lists will take more time than short lists. Care should be taken to avoid using **CSLCount()** (p. 308) as an end condition for loops as it will result in  $O(n^2)$  behavior.

**Parameters:**

*papszStrList* the string list to count.

**Returns:**

the number of entries.

**17.7.2.7 void CSLDestroy (char \*\* *papszStrList*)**

Free string list.

Frees the passed string list (null terminated array of strings). It is safe to pass NULL.

**Parameters:**

*papszStrList* the list to free.

**17.7.2.8 char\*\* CSLDuplicate (char \*\* *papszStrList*)**

Clone a string list.

Efficiently allocates a copy of a string list. The returned list is owned by the caller and should be freed with **CSLDestroy()** (p. 308).

**Parameters:**

*papszStrList* the input string list.

**Returns:**

newly allocated copy.

**17.7.2.9 int CSLFindString (char \*\* *papszList*, const char \* *pszTarget*)**

Find a string within a string list.

Returns the index of the entry in the string list that contains the target string. The string in the string list must be a full match for the target, but the search is case insensitive.

**Parameters:**

*papszList* the string list to be searched.

*pszTarget* the string to be searched for.

---

**Returns:**

the index of the string within the list or -1 on failure.

**17.7.2.10 char\*\* CSLLoad (const char \* *pszFname*)**

Load a text file into a string list.

The VSI\*L API is used, so **VSIFOpenL()** (p. 315) supported objects that aren't physical files can also be accessed. Files are returned as a string list, with one item in the string list per line. End of line markers are stripped (by **CPLReadLineL()** (p. 280)).

If reading the file fails a **CPLError()** (p. 287) will be issued and NULL returned.

**Parameters:**

*pszFname* the name of the file to read.

**Returns:**

a string list with the files lines, now owned by caller.

References **VSIFCloseL()**, **VSIFEofL()**, and **VSIFOpenL()**.

**17.7.2.11 char\*\* CSLMerge (char \*\* *papszOrig*, char \*\* *papszOverride*)**

Merge two lists.

The two lists are merged, ensuring that if any keys appear in both that the value from the second (*papszOverride*) list take precedence.

**Parameters:**

*papszOrig* the original list, being modified.

*papszOverride* the list of items being merged in. This list is unaltered and remains owned by the caller.

**Returns:**

updated list.

**17.7.2.12 int CSLPartialFindString (char \*\* *papszHaystack*, const char \* *pszNeedle*)**

Find a substring within a string list.

Returns the index of the entry in the string list that contains the target string as a substring. The search is case sensitive (unlike **CSLFindString()** (p. 308)).

**Parameters:**

*papszHaystack* the string list to be searched.

*pszNeedle* the substring to be searched for.

**Returns:**

the index of the string within the list or -1 on failure.

---

**17.7.2.13 char\*\* CSLSetNameValue (char \*\* *papszList*, const char \* *pszName*, const char \* *pszValue*)**

Assign value to name in StringList.

Set the value for a given name in a StringList of "Name=Value" pairs ("Name:Value" pairs are also supported for backward compatibility with older stuff.)

If there is already a value for that name in the list then the value is changed, otherwise a new "Name=Value" pair is added.

**Parameters:**

*papszList* the original list, the modified version is returned.

*pszName* the name to be assigned a value. This should be a well formed token (no spaces or very special characters).

*pszValue* the value to assign to the name. This should not contain any newlines (CR or LF) but is otherwise pretty much unconstrained. If NULL any corresponding value will be removed.

**Returns:**

modified stringlist.

**17.7.2.14 void CSLSetNameValueSeparator (char \*\* *papszList*, const char \* *pszSeparator*)**

Replace the default separator (":" or "=") with the passed separator in the given name/value list.

Note that if a separator other than ":" or "=" is used, the resulting list will not be manipulatable by the CSL name/value functions any more.

The **CPLParseNameValue()** (p. 307) function is used to break the existing lines, and it also strips white space from around the existing delimiter, thus the old separator, and any white space will be replaced by the new separator. For formatting purposes it may be desirable to include some white space in the new separator. eg. ": " or " = ".

**Parameters:**

*papszList* the list to update. Component strings may be freed but the list array will remain at the same location.

*pszSeparator* the new separator string to insert.

**17.7.2.15 int CSLTestBoolean (const char \* *pszValue*)**

Test what boolean value contained in the string.

If *pszValue* is "NO", "FALSE", "OFF" or "0" will be returned FALSE. Otherwise, TRUE will be returned.

**Parameters:**

*pszValue* the string should be tested.

**Returns:**

TRUE or FALSE.

---

**17.7.2.16 char\*\* CSLTokenizeString2 (const char \* *pszString*, const char \* *pszDelimiters*, int *nCSLTFlags*)**

Tokenize a string.

This function will split a string into tokens based on specified' delimiter(s) with a variety of options. The returned result is a string list that should be freed with **CSLDestroy()** (p. 308) when no longer needed.

The available parsing options are:

- **CSLT\_ALLOWEMPTYTOKENS**: Allow the return of empty tokens when two delimiters in a row occur with no other text between them. If not set, empty tokens will be discarded.
- **CSLT\_HONOURSTRINGS**: double quotes can be used to hold values that should not be broken into multiple tokens.
- **CSLT\_PRESERVEQUOTES**: String quotes are carried into the tokens when this is set, otherwise they are removed.
- **CSLT\_PRESERVEESCAPES**: If set backslash escapes (for backslash itself, and for literal double quotes) will be preserved in the tokens, otherwise the backslashes will be removed in processing.

**Example:**

Parse a string into tokens based on various white space (space, newline, tab) and then print out results and cleanup. Quotes may be used to hold white space in tokens.

```
char **papszTokens;
int i;

papszTokens =
    CSLTokenizeString2( pszCommand, " \t\n",
                       CSLT_HONOURSTRINGS | CSLT_ALLOWEMPTYTOKENS );

for( i = 0; papszTokens != NULL && papszTokens[i] != NULL; i++ )
    printf( "arg %d: '%s'", papszTokens[i] );
CSLDestroy( papszTokens );
```

**Parameters:**

***pszString*** the string to be split into tokens.

***pszDelimiters*** one or more characters to be used as token delimiters.

***nCSLTFlags*** an ORing of one or more of the **CSLT\_** flag values.

**Returns:**

a string list of tokens owned by the caller.

---

## 17.8 cpl\_vsi.h File Reference

```
#include "cpl_port.h"
#include <unistd.h>
#include <sys/stat.h>
```

### Functions

- FILE \* **VSIFOpenL** (const char \*, const char \*)  
*Open file.*
  - int **VSIFCloseL** (FILE \*)  
*Close file.*
  - int **VSIFSeekL** (FILE \*, vsi\_l\_offset, int)  
*Seek to requested offset.*
  - vsi\_l\_offset **VSIFTellL** (FILE \*)  
*Tell current file offset.*
  - size\_t **VSIFReadL** (void \*, size\_t, size\_t, FILE \*)  
*Read bytes from file.*
  - size\_t **VSIFWriteL** (const void \*, size\_t, size\_t, FILE \*)  
*Write bytes to file.*
  - int **VSIFEOF** (FILE \*)  
*Test for end of file.*
  - int **VSIFFlushL** (FILE \*)  
*Flush pending writes to disk.*
  - int **VSIFPrintfL** (FILE \*, const char \*,...)  
*Formatted write to file.*
  - int **VSISStatL** (const char \*, VSISStatBufL \*)  
*Get filesystem object info.*
  - char \*\* **VSIRReadDir** (const char \*)  
*Read names in a directory.*
  - int **VSIMkdir** (const char \*pathname, long mode)  
*Create a directory.*
  - int **VSIRmdir** (const char \*pathname)  
*Delete a directory.*
  - int **VSIUnlink** (const char \*pathname)
-

*Delete a file.*

- **int VSIRename** (const char \*oldpath, const char \*newpath)  
*Rename a file.*
- **void VSIIInstallMemFileHandler** (void)  
*Install "memory" file system handler.*
- **FILE \* VSIFileFromMemBuffer** (const char \*pszFilename, GByte \*pabyData, vsi\_l\_offset nDataLength, int bTakeOwnership)  
*Create memory "file" from a buffer.*
- **GByte \* VSIGetMemFileBuffer** (const char \*pszFilename, vsi\_l\_offset \*pnDataLength, int bUnlinkAndSeize)  
*Fetch buffer underlying memory file.*

### 17.8.1 Detailed Description

Standard C Covers

The VSI functions are intended to be hookable aliases for Standard C I/O, memory allocation and other system functions. They are intended to allow virtualization of disk I/O so that non file data sources can be made to appear as files, and so that additional error trapping and reporting can be interested. The memory access API is aliased so that special application memory management services can be used.

Is intended that each of these functions retains exactly the same calling pattern as the original Standard C functions they relate to. This means we don't have to provide custom documentation, and also means that the default implementation is very simple.

### 17.8.2 Function Documentation

#### 17.8.2.1 int VSIFCloseL (FILE \*fp)

Close file.

This function closes the indicated file.

This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fclose() function.

#### Parameters:

*fp* file handle opened with **VSIFOpenL()** (p. 315).

#### Returns:

0 on success or -1 on failure.

References VSIFCloseL().

Referenced by CPLCloseShared(), CPLParseXMLFile(), CPLSerializeXMLTreeToFile(), CSLLoad(), and VSIFCloseL().

### 17.8.2.2 int VSIFEOF(L) (FILE \*fp)

Test for end of file.

Returns TRUE (non-zero) if the file read/write offset is currently at the end of the file.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX feof() call.

#### Parameters:

*fp* file handle opened with **VSIFOpenL()** (p. 315).

#### Returns:

TRUE if at EOF else FALSE.

References VSIFEOF(L).

Referenced by CSLLoad(), and VSIFEOF(L).

### 17.8.2.3 int VSIFFLUSH(L) (FILE \*fp)

Flush pending writes to disk.

For files in write or update mode and on filesystem types where it is applicable, all pending output on the file is flushed to the physical disk.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fflush() call.

#### Parameters:

*fp* file handle opened with **VSIFOpenL()** (p. 315).

#### Returns:

0 on success or -1 on error.

References VSIFFLUSH(L).

Referenced by VSIFFLUSH(L).

### 17.8.2.4 FILE\* VSIFFileFromMemBuffer (const char \*pszFilename, GByte \*pabyData, vsi\_l\_offset nDataLength, int bTakeOwnership)

Create memory "file" from a buffer.

A virtual memory file is created from the passed buffer with the indicated filename. Under normal conditions the filename would need to be absolute and within the /vsimem/ portion of the filesystem.

If bTakeOwnership is TRUE, then the memory file system handler will take ownership of the buffer, freeing it when the file is deleted. Otherwise it remains the responsibility of the caller, but should not be freed as long as it might be accessed as a file. In no circumstances does this function take a copy of the pabyData contents.

---

**Parameters:**

- pszFilename* the filename to be created.
- pabyData* the data buffer for the file.
- nDataLength* the length of buffer in bytes.
- bTakeOwnership* TRUE to transfer "ownership" of buffer or FALSE.

**Returns:**

open file handle on created file (see **VSIFOpenL()** (p. 315)).

References VSIFFileFromMemBuffer(), and VSIIInstallMemFileHandler().

Referenced by VSIFFileFromMemBuffer().

**17.8.2.5 FILE\* VSIFOpenL (const char \* *pszFilename*, const char \* *pszAccess*)**

Open file.

This function opens a file with the desired access. Large files (larger than 2GB) should be supported. Binary access is always implied and the "b" does not need to be included in the *pszAccess* string.

Note that the "FILE \*" returned by this function is not really a standard C library FILE \*, and cannot be used with any functions other than the "VSI\*L" family of functions. They aren't "real" FILE objects.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fopen() function.

**Parameters:**

- pszFilename* the file to open.
- pszAccess* access requested (ie. "r", "r+", "w").

**Returns:**

NULL on failure, or the file handle.

References VSIFOpenL().

Referenced by CPLOpenShared(), CPLParseXMLFile(), CPLSerializeXMLTreeToFile(), CSLLoad(), and VSIFOpenL().

**17.8.2.6 int VSIFPrintfL (FILE \* *fp*, const char \* *pszFormat*, ...)**

Formatted write to file.

Provides fprintf() style formatted output to a VSI\*L file. This formats an internal buffer which is written using **VSIFWriteL()** (p. 317).

Analog of the POSIX fprintf() call.

**Parameters:**

- fp* file handle opened with **VSIFOpenL()** (p. 315).
- pszFormat* the printf style format string.

---

**Returns:**

the number of bytes written or -1 on an error.

References VSIFPrintfL(), and VSIFWriteL().

Referenced by VSIFPrintfL().

**17.8.2.7 size\_t VSIFReadL (void \* *pBuffer*, size\_t *nSize*, size\_t *nCount*, FILE \* *fp*)**

Read bytes from file.

Reads *nCount* objects of *nSize* bytes from the indicated file at the current offset into the indicated buffer.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fread() call.

**Parameters:**

***pBuffer*** the buffer into which the data should be read (at least *nCount* \* *nSize* bytes in size).

***nSize*** size of objects to read in bytes.

***nCount*** number of objects to read.

***fp*** file handle opened with VSIFOpenL() (p. 315).

**Returns:**

number of objects successfully read.

References VSIFReadL().

Referenced by CPLParseXMLFile(), CPLReadLineL(), and VSIFReadL().

**17.8.2.8 int VSIFSeekL (FILE \* *fp*, vsi\_l\_offset *nOffset*, int *nWhence*)**

Seek to requested offset.

Seek to the desired offset (*nOffset*) in the indicated file.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fseek() call.

**Parameters:**

***fp*** file handle opened with VSIFOpenL() (p. 315).

***nOffset*** offset in bytes.

***nWhence*** one of SEEK\_SET, SEEK\_CUR or SEEK\_END.

**Returns:**

0 on success or -1 one failure.

References VSIFSeekL().

Referenced by CPLParseXMLFile(), CPLReadLineL(), and VSIFSeekL().

---

**17.8.2.9 vsi\_l\_offset VSIFTellL (FILE \*fp)**

Tell current file offset.

Returns the current file read/write offset in bytes from the beginning of the file.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX ftell() call.

**Parameters:**

*fp* file handle opened with **VSIFOpenL()** (p. 315).

**Returns:**

file offset in bytes.

References VSIFTellL().

Referenced by CPLParseXMLFile(), CPLReadLineL(), and VSIFTellL().

**17.8.2.10 size\_t VSIFWriteL (const void \*pBuffer, size\_t nSize, size\_t nCount, FILE \*fp)**

Write bytes to file.

Writes nCount objects of nSize bytes to the indicated file at the current offset into the indicated buffer.

This method goes through the VSIFFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX fwrite() call.

**Parameters:**

*pBuffer* the buffer from which the data should be written (at least nCount \* nSize bytes in size).

*nSize* size of objects to read in bytes.

*nCount* number of objects to read.

*fp* file handle opened with **VSIFOpenL()** (p. 315).

**Returns:**

number of objects successfully written.

References VSIFWriteL().

Referenced by CPLSerializeXMLTreeToFile(), VSIFPrintfL(), and VSIFWriteL().

**17.8.2.11 GByte\* VSIGetMemFileBuffer (const char \*pszFilename, vsi\_l\_offset \*pnDataLength, int bUnlinkAndSeize)**

Fetch buffer underlying memory file.

This function returns a pointer to the memory buffer underlying a virtual "in memory" file. If bUnlinkAndSeize is TRUE the filesystem object will be deleted, and ownership of the buffer will pass to the caller otherwise the underlying file will remain in existence.

---

**Parameters:**

- pszFilename* the name of the file to grab the buffer of.
- pnDataLength* (file) length returned in this variable.
- bUnlinkAndSeize* TRUE to remove the file, or FALSE to leave unaltered.

**Returns:**

pointer to memory buffer or NULL on failure.

References VSIGetMemFileBuffer().

Referenced by VSIGetMemFileBuffer().

**17.8.2.12 void VSIIInstallMemFileHandler (void)**

Install "memory" file system handler.

A special file handler is installed that allows block of memory to be treated as files. All portions of the file system underneath the base path "/vsimem/" will be handled by this driver.

Normal VSI\*L functions can be used freely to create and destroy memory arrays treating them as if they were real file system objects. Some additional methods exist to efficient create memory file system objects without duplicating original copies of the data or to "steal" the block of memory associated with a memory file.

At this time the memory handler does not properly handle directory semantics for the memory portion of the filesystem. The **VSIReadDir()** (p. 319) function is not supported though this will be corrected in the future.

Calling this function repeatedly should do no harm, though it is not necessary. It is already called the first time a virtualizable file access function (ie. **VSIFOpenL()** (p. 315), **VSIMkdir()**, etc) is called.

This code example demonstrates using GDAL to translate from one memory buffer to another.

```

GByte *ConvertBufferFormat( GByte *pabyInData, vsi_l_offset nInDataLength,
                           vsi_l_offset *pnOutDataLength )
{
    // create memory file system object from buffer.
    VSIFCloseL( VSIFFileFromMemBuffer( "/vsimem/work.dat", pabyInData,
                                       nInDataLength, FALSE ) );

    // Open memory buffer for read.
    GDALDatasetH hDS = GDALOpen( "/vsimem/work.dat", GA_ReadOnly );

    // Get output format driver.
    GDALDriverH hDriver = GDALGetDriverByName( "GTiff" );
    GDALDatasetH hOutDS;

    hOutDS = GDALCreateCopy( hDriver, "/vsimem/out.tif", hDS, TRUE, NULL,
                           NULL, NULL );

    // close source file, and "unlink" it.
    GDALClose( hDS );
    VSIUnlink( "/vsimem/work.dat" );

    // seize the buffer associated with the output file.

    return VSIGetMemFileBuffer( "/vsimem/out.tif", pnOutDataLength, TRUE );
}

```

References VSIIInstallMemFileHandler().

Referenced by VSIFileFromMemBuffer(), and VSIIInstallMemFileHandler().

#### 17.8.2.13 int VSIMkdir (const char \* *pszPathname*, long *mode*)

Create a directory.

Create a new directory with the indicated mode. The mode is ignored on some platforms. A reasonable default mode value would be 0666. This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX mkdir() function.

##### Parameters:

*pszPathname* the path to the directory to create.

*mode* the permissions mode.

##### Returns:

0 on success or -1 on an error.

References VSIMkdir().

Referenced by VSIMkdir().

#### 17.8.2.14 char\*\* VSIReadDir (const char \* *pszPath*)

Read names in a directory.

This function abstracts access to directory contents. It returns a list of strings containing the names of files, and directories in this directory. The resulting string list becomes the responsibility of the application and should be freed with **CSLDestroy()** (p. 308) when no longer needed.

Note that no error is issued via **CPLError()** (p. 287) if the directory path is invalid, though NULL is returned.

This function used to be known as CPLReadDir(), but the old name is now deprecated.

##### Parameters:

*pszPath* the relative, or absolute path of a directory to read.

##### Returns:

The list of entries in the directory, or NULL if the directory doesn't exist.

References VSIReadDir().

Referenced by VSIReadDir().

#### 17.8.2.15 int VSIRename (const char \* *oldpath*, const char \* *newpath*)

Rename a file.

Renames a file object in the file system. It should be possible to rename a file onto a new filesystem, but it is safest if this function is only used to rename files that remain in the same directory.

---

This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX rename() function.

**Parameters:**

*oldpath* the name of the file to be renamed.

*newpath* the name the file should be given.

**Returns:**

0 on success or -1 on an error.

References VSIRename().

Referenced by VSIRename().

#### 17.8.2.16 int VSIRmdir (const char \* *pszDirname*)

Delete a directory.

Deletes a directory object from the file system. On some systems the directory must be empty before it can be deleted.

This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX rmdir() function.

**Parameters:**

*pszDirname* the path of the directory to be deleted.

**Returns:**

0 on success or -1 on an error.

References VSIRmdir().

Referenced by VSIRmdir().

#### 17.8.2.17 int VSISatL (const char \* *pszFilename*, VSISatBufL \* *psStatBuf*)

Get filesystem object info.

Fetches status information about a filesystem object (file, directory, etc). The returned information is placed in the VSISatBufL structure. For portability only the st\_size (size in bytes), and st\_mode (file type). This method is similar to VSISat(), but will work on large files on systems where this requires special calls.

This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX stat() function.

**Parameters:**

*pszFilename* the path of the filesystem object to be queried.

---

*psStatBuf* the structure to load with information.

**Returns:**

0 on success or -1 on an error.

References VSISatL().

Referenced by CPLCheckForFile(), and VSISatL().

**17.8.2.18 int VSIUnlink (const char \* *pszFilename*)**

Delete a file.

Deletes a file object from the file system.

This method goes through the VSIFileHandler virtualization and may work on unusual filesystems such as in memory.

Analog of the POSIX unlink() function.

**Parameters:**

*pszFilename* the path of the file to be deleted.

**Returns:**

0 on success or -1 on an error.

References VSIUnlink().

Referenced by VSIUnlink().

---

## 17.9 ogr\_api.h File Reference

```
#include "ogr_core.h"
```

### Functions

- OGRErr **OGR\_G\_CreateFromWkb** (unsigned char \*, OGRSpatialReferenceH, OGRGeometryH \*, int)
- OGRErr **OGR\_G\_CreateFromWkt** (char \*\*, OGRSpatialReferenceH, OGRGeometryH \*)
- void **OGR\_G\_DestroyGeometry** (OGRGeometryH)
- OGRGeometryH **OGR\_G\_CreateGeometry** (**OGRwkbGeometryType**)
- int **OGR\_G\_GetDimension** (OGRGeometryH)
- int **OGR\_G\_GetCoordinateDimension** (OGRGeometryH)
- OGRGeometryH **OGR\_G\_Clone** (OGRGeometryH)
- void **OGR\_G\_GetEnvelope** (OGRGeometryH, **OGREnvelope** \*)
- OGRErr **OGR\_G\_ImportFromWkb** (OGRGeometryH, unsigned char \*, int)
- OGRErr **OGR\_G\_ExportToWkb** (OGRGeometryH, OGRwkbByteOrder, unsigned char \*)
- int **OGR\_G\_WkbSize** (OGRGeometryH hGeom)
- OGRErr **OGR\_G\_ImportFromWkt** (OGRGeometryH, char \*\*)
- OGRErr **OGR\_G\_ExportToWkt** (OGRGeometryH, char \*\*)
- **OGRwkbGeometryType** **OGR\_G\_GetGeometryType** (OGRGeometryH)
- const char \* **OGR\_G\_GetGeometryName** (OGRGeometryH)
- void **OGR\_G\_DumpReadable** (OGRGeometryH, FILE \*, const char \*)
- void **OGR\_G\_FlattenTo2D** (OGRGeometryH)
- void **OGR\_G\_AssignSpatialReference** (OGRGeometryH, OGRSpatialReferenceH)
- OGRSpatialReferenceH **OGR\_G\_GetSpatialReference** (OGRGeometryH)
- OGRErr **OGR\_G\_Transform** (OGRGeometryH, OGRCoordinateTransformationH)
- OGRErr **OGR\_G\_TransformTo** (OGRGeometryH, OGRSpatialReferenceH)
- int **OGR\_G\_Intersects** (OGRGeometryH, OGRGeometryH)
- int **OGR\_G\_Equals** (OGRGeometryH, OGRGeometryH)
- double **OGR\_G\_GetArea** (OGRGeometryH)
- void **OGR\_G\_Empty** (OGRGeometryH)
- int **OGR\_G\_GetPointCount** (OGRGeometryH)
- double **OGR\_G\_GetX** (OGRGeometryH, int)
- double **OGR\_G\_GetY** (OGRGeometryH, int)
- double **OGR\_G\_GetZ** (OGRGeometryH, int)
- void **OGR\_G\_GetPoint** (OGRGeometryH, int iPoint, double \*, double \*, double \*)
- void **OGR\_G\_SetPoint** (OGRGeometryH, int iPoint, double, double, double)
- void **OGR\_G\_SetPoint\_2D** (OGRGeometryH, int iPoint, double, double)
- void **OGR\_G\_AddPoint** (OGRGeometryH, double, double, double)
- void **OGR\_G\_AddPoint\_2D** (OGRGeometryH, double, double)
- int **OGR\_G\_GetGeometryCount** (OGRGeometryH)
- OGRGeometryH **OGR\_G\_GetGeometryRef** (OGRGeometryH, int)
- OGRErr **OGR\_G\_AddGeometry** (OGRGeometryH, OGRGeometryH)
- OGRErr **OGR\_G\_AddGeometryDirectly** (OGRGeometryH, OGRGeometryH)
- OGRErr **OGR\_G\_RemoveGeometry** (OGRGeometryH, int, int)
- OGRGeometryH **OGR\_BuildPolygonFromEdges** (OGRGeometryH hLinesAsCollection, int bBest-Effort, int bAutoClose, double dfTolerance, OGRErr \*peErr)
- OGRFieldDefnH **OGR\_Fld\_Create** (const char \*, **OGRFieldType**)
- void **OGR\_Fld\_Destroy** (OGRFieldDefnH)

- void **OGR\_Fld\_SetName** (OGRFieldDefnH, const char \*)
  - const char \* **OGR\_Fld\_GetNameRef** (OGRFieldDefnH)
  - **OGRFieldType** **OGR\_Fld\_GetType** (OGRFieldDefnH)
  - void **OGR\_Fld\_SetType** (OGRFieldDefnH, **OGRFieldType**)
  - **OGRJustification** **OGR\_Fld\_GetJustify** (OGRFieldDefnH)
  - void **OGR\_Fld\_SetJustify** (OGRFieldDefnH, **OGRJustification**)
  - int **OGR\_Fld\_GetWidth** (OGRFieldDefnH)
  - void **OGR\_Fld\_SetWidth** (OGRFieldDefnH, int)
  - int **OGR\_Fld\_GetPrecision** (OGRFieldDefnH)
  - void **OGR\_Fld\_SetPrecision** (OGRFieldDefnH, int)
  - void **OGR\_Fld\_Set** (OGRFieldDefnH, const char \*, **OGRFieldType**, int, int, **OGRJustification**)
  - const char \* **OGR\_GetFieldTypeName** (**OGRFieldType**)
  - OGRFeatureDefnH **OGR\_FD\_Create** (const char \*)
  - void **OGR\_FD\_Destroy** (OGRFeatureDefnH)
  - void **OGR\_FD\_Release** (OGRFeatureDefnH)
  - const char \* **OGR\_FD\_GetName** (OGRFeatureDefnH)
  - int **OGR\_FD\_GetFieldCount** (OGRFeatureDefnH)
  - OGRFieldDefnH **OGR\_FD\_GetFieldDefn** (OGRFeatureDefnH, int)
  - int **OGR\_FD\_GetFieldIndex** (OGRFeatureDefnH, const char \*)
  - void **OGR\_FD\_AddFieldDefn** (OGRFeatureDefnH, OGRFieldDefnH)
  - **OGRwkbGeometryType** **OGR\_FD\_GetGeomType** (OGRFeatureDefnH)
  - void **OGR\_FD\_SetGeomType** (OGRFeatureDefnH, **OGRwkbGeometryType**)
  - int **OGR\_FD\_Reference** (OGRFeatureDefnH)
  - int **OGR\_FD\_Dereference** (OGRFeatureDefnH)
  - int **OGR\_FD\_GetReferenceCount** (OGRFeatureDefnH)
  - OGRFeatureH **OGR\_F\_Create** (OGRFeatureDefnH)
  - void **OGR\_F\_Destroy** (OGRFeatureH)
  - OGRFeatureDefnH **OGR\_F\_GetDefnRef** (OGRFeatureH)
  - OGRErr **OGR\_F\_SetGeometryDirectly** (OGRFeatureH, OGRGeometryH)
  - OGRErr **OGR\_F\_SetGeometry** (OGRFeatureH, OGRGeometryH)
  - OGRGeometryH **OGR\_F\_GetGeometryRef** (OGRFeatureH)
  - OGRFeatureH **OGR\_F\_Clone** (OGRFeatureH)
  - int **OGR\_F\_Equal** (OGRFeatureH, OGRFeatureH)
  - int **OGR\_F\_GetFieldCount** (OGRFeatureH)
  - OGRFieldDefnH **OGR\_F\_GetFieldDefnRef** (OGRFeatureH, int)
  - int **OGR\_F\_GetFieldIndex** (OGRFeatureH, const char \*)
  - int **OGR\_F\_IsFieldSet** (OGRFeatureH, int)
  - void **OGR\_F\_UnsetField** (OGRFeatureH, int)
  - **OGRField** \* **OGR\_F\_GetRawFieldRef** (OGRFeatureH, int)
  - int **OGR\_F\_GetFieldAsInteger** (OGRFeatureH, int)
  - double **OGR\_F\_GetFieldAsDouble** (OGRFeatureH, int)
  - const char \* **OGR\_F\_GetFieldAsString** (OGRFeatureH, int)
  - const int \* **OGR\_F\_GetFieldAsIntegerList** (OGRFeatureH, int, int \*)
  - const double \* **OGR\_F\_GetFieldAsDoubleList** (OGRFeatureH, int, int \*)
  - char \*\* **OGR\_F\_GetFieldAsStringList** (OGRFeatureH, int)
  - GByte \* **OGR\_F\_GetFieldAsBinary** (OGRFeatureH, int, int \*)
  - int **OGR\_F\_GetFieldAsDateTime** (OGRFeatureH, int, int \*, int \*, int \*, int \*, int \*, int \*, int \*)
  - void **OGR\_F\_SetFieldInteger** (OGRFeatureH, int, int)
  - void **OGR\_F\_SetFieldDouble** (OGRFeatureH, int, double)
  - void **OGR\_F\_SetFieldString** (OGRFeatureH, int, const char \*)
-

- void **OGR\_F\_SetFieldIntegerList** (OGRFeatureH, int, int, int \*)
  - void **OGR\_F\_SetFieldDoubleList** (OGRFeatureH, int, int, double \*)
  - void **OGR\_F\_SetFieldStringList** (OGRFeatureH, int, char \*\*)
  - void **OGR\_F\_SetFieldRaw** (OGRFeatureH, int, **OGRField** \*)
  - void **OGR\_F\_SetFieldBinary** (OGRFeatureH, int, int, GByte \*)
  - void **OGR\_F\_SetFieldDateTime** (OGRFeatureH, int, int, int, int, int, int, int, int)
  - long **OGR\_F\_GetFID** (OGRFeatureH)
  - OGRErr **OGR\_F\_SetFID** (OGRFeatureH, long)
  - void **OGR\_F\_DumpReadable** (OGRFeatureH, FILE \*)
  - OGRErr **OGR\_F\_SetFrom** (OGRFeatureH, OGRFeatureH, int)
  - const char \* **OGR\_F\_GetStyleString** (OGRFeatureH)
  - void **OGR\_F\_SetStyleString** (OGRFeatureH, const char \*)
  - void **OGR\_F\_SetStyleStringDirectly** (OGRFeatureH, char \*)
  - OGRGeometryH **OGR\_L\_GetSpatialFilter** (OGRLayerH)
  - void **OGR\_L\_SetSpatialFilter** (OGRLayerH, OGRGeometryH)
  - OGRErr **OGR\_L\_SetAttributeFilter** (OGRLayerH, const char \*)
  - void **OGR\_L\_ResetReading** (OGRLayerH)
  - OGRFeatureH **OGR\_L\_GetNextFeature** (OGRLayerH)
  - OGRFeatureH **OGR\_L\_GetFeature** (OGRLayerH, long)
  - OGRErr **OGR\_L\_SetFeature** (OGRLayerH, OGRFeatureH)
  - OGRErr **OGR\_L\_CreateFeature** (OGRLayerH, OGRFeatureH)
  - OGRErr **OGR\_L\_DeleteFeature** (OGRLayerH, long)
  - OGRFeatureDefnH **OGR\_L\_GetLayerDefn** (OGRLayerH)
  - OGRSpatialReferenceH **OGR\_L\_GetSpatialRef** (OGRLayerH)
  - OGRErr **OGR\_L\_GetExtent** (OGRLayerH, **OGREnvelope** \*, int)
  - int **OGR\_L\_TestCapability** (OGRLayerH, const char \*)
  - OGRErr **OGR\_L\_CreateField** (OGRLayerH, OGRFieldDefnH, int)
  - OGRErr **OGR\_L\_StartTransaction** (OGRLayerH)
  - OGRErr **OGR\_L\_CommitTransaction** (OGRLayerH)
  - OGRErr **OGR\_L\_RollbackTransaction** (OGRLayerH)
  - const char \* **OGR\_DS\_GetName** (OGRDataSourceH)
  - int **OGR\_DS\_GetLayerCount** (OGRDataSourceH)
  - OGRLayerH **OGR\_DS\_GetLayer** (OGRDataSourceH, int)
  - OGRLayerH **OGR\_DS\_GetLayerByName** (OGRDataSourceH, const char \*)
  - OGRLayerH **OGR\_DS\_CreateLayer** (OGRDataSourceH, const char \*, OGRSpatialReferenceH, **OGRwkbGeometryType**, char \*\*)
  - int **OGR\_DS\_TestCapability** (OGRDataSourceH, const char \*)
  - OGRLayerH **OGR\_DS\_ExecuteSQL** (OGRDataSourceH, const char \*, OGRGeometryH, const char \*)
  - void **OGR\_DS\_ReleaseResultSet** (OGRDataSourceH, OGRLayerH)
  - const char \* **OGR\_Dr\_GetName** (OGRSFDriverH)
  - OGRDataSourceH **OGR\_Dr\_Open** (OGRSFDriverH, const char \*, int)
  - int **OGR\_Dr\_TestCapability** (OGRSFDriverH, const char \*)
  - OGRDataSourceH **OGR\_Dr\_CreateDataSource** (OGRSFDriverH, const char \*, char \*\*)
  - OGRDataSourceH **OGR\_Open** (const char \*, int, OGRSFDriverH \*)
  - void **OGRRegisterDriver** (OGRSFDriverH)
  - int **OGRGetDriverCount** (void)
  - OGRSFDriverH **OGRGetDriver** (int)
  - void **OGRRegisterAll** (void)
  - OGRStyleMgrH **OGR\_SM\_Create** (void \*hStyleTable)
-

- void **OGR\_SM\_Destroy** (OGRStyleMgrH hSM)
- const char \* **OGR\_SM\_InitFromFeature** (OGRStyleMgrH hSM, OGRFeatureH hFeat)
- int **OGR\_SM\_InitStyleString** (OGRStyleMgrH hSM, const char \*pszStyleString)
- int **OGR\_SM\_GetPartCount** (OGRStyleMgrH hSM, const char \*pszStyleString)
- OGRStyleToolH **OGR\_SM\_GetPart** (OGRStyleMgrH hSM, int nPartId, const char \*pszStyleString)
- int **OGR\_SM\_AddPart** (OGRStyleMgrH hSM, OGRStyleToolH hST)
- OGRStyleToolH **OGR\_ST\_Create** (OGRSTClassId eClassId)
- void **OGR\_ST\_Destroy** (OGRStyleToolH hST)
- OGRSTClassId **OGR\_ST\_GetType** (OGRStyleToolH hST)
- OGRSTUnitId **OGR\_ST\_GetUnit** (OGRStyleToolH hST)
- void **OGR\_ST\_SetUnit** (OGRStyleToolH hST, OGRSTUnitId eUnit, double dfGroundPaperScale)
- const char \* **OGR\_ST\_GetParamStr** (OGRStyleToolH hST, int eParam, int \*bValueIsNull)
- int **OGR\_ST\_GetParamNum** (OGRStyleToolH hST, int eParam, int \*bValueIsNull)
- double **OGR\_ST\_GetParamDbl** (OGRStyleToolH hST, int eParam, int \*bValueIsNull)
- void **OGR\_ST\_SetParamStr** (OGRStyleToolH hST, int eParam, const char \*pszValue)
- void **OGR\_ST\_SetParamNum** (OGRStyleToolH hST, int eParam, int nValue)
- const char \* **OGR\_ST\_GetStyleString** (OGRStyleToolH hST)
- int **OGR\_ST\_GetRGBFromString** (OGRStyleToolH hST, const char \*pszColor, int \*pnRed, int \*pnGreen, int \*pnBlue, int \*pnAlpha)

### 17.9.1 Detailed Description

C API and defines for **OGRFeature** (p. 99), **OGRGeometry** (p. 124), and **OGRDataSource** (p. 90) related classes.

See also: **ogr\_geometry.h** (p. 390), **ogr\_feature.h** (p. 389), **ogrsf\_frmts.h** (p. 402), **ogr\_featurestyle.h** (p. ??)

### 17.9.2 Function Documentation

#### 17.9.2.1 OGRDataSourceH OGR\_Dr\_CreateDataSource (OGRSFDriverH *hDriver*, const char \* *pszName*, char \*\* *papszOptions*)

This function attempts to create a new data source based on the passed driver. The *papszOptions* argument can be used to control driver specific creation options. These options are normally documented in the format specific documentation.

This function is the same as the C++ method **OGRSFDriver::CreateDataSource()** (p. 211).

#### Parameters:

***hDriver*** handle to the driver on which data source creation is based.

***pszName*** the name for the new data source.

***papszOptions*** a StringList of name=value options. Options are driver specific, and driver information can be found at the following url: [http://www.gdal.org/ogr/ogr\\_formats.html](http://www.gdal.org/ogr/ogr_formats.html)

#### Returns:

NULL is returned on failure, or a new **OGRDataSource** (p. 90) handle on success.

References **OGRSFDriver::CreateDataSource()**, **OGRDataSource::GetDriver()**, **OGR\_Dr\_CreateDataSource()**, and **OGRDataSource::SetDriver()**.

Referenced by **OGR\_Dr\_CreateDataSource()**.

### 17.9.2.2 `const char * OGR_Dr_GetName (OGRSFDriverH hDriver)`

Fetch name of driver (file format). This name should be relatively short (10-40 characters), and should reflect the underlying file format. For instance "ESRI Shapefile".

This function is the same as the C++ method **OGRSFDriver::GetName()** (p. 212).

#### Parameters:

*hDriver* handle to the driver to get the name from.

#### Returns:

driver name. This is an internal string and should not be modified or freed.

References OGR\_Dr\_GetName().

Referenced by OGR\_Dr\_GetName().

### 17.9.2.3 `OGRDataSourceH OGR_Dr_Open (OGRSFDriverH hDriver, const char * pszName, int bUpdate)`

Attempt to open file with this driver.

This function is the same as the C++ method **OGRSFDriver::Open()** (p. 212).

#### Parameters:

*hDriver* handle to the driver that is used to open file.

*pszName* the name of the file, or data source to try and open.

*bUpdate* TRUE if update access is required, otherwise FALSE (the default).

#### Returns:

NULL on error or if the pass name is not supported by this driver, otherwise an handle to an **OGRDataSource** (p. 90). This **OGRDataSource** (p. 90) should be closed by deleting the object when it is no longer needed.

References OGRDataSource::GetDriver(), OGR\_Dr\_Open(), and OGRDataSource::SetDriver().

Referenced by OGR\_Dr\_Open().

### 17.9.2.4 `int OGR_Dr_TestCapability (OGRSFDriverH hDriver, const char * pszCap)`

Test if capability is available.

One of the following data source capability names can be passed into this function, and a TRUE or FALSE value will be returned indicating whether or not the capability is available for this object.

- **ODrCCreateDataSource**: True if this driver can support creating data sources.
- **ODrCDeleteDataSource**: True if this driver supports deleting data sources.

The define macro forms of the capability names should be used in preference to the strings themselves to avoid misspelling.

This function is the same as the C++ method **OGRSFDriver::TestCapability()** (p. 213).

---

**Parameters:**

*hDriver* handle to the driver to test the capability against.

*pszCap* the capability to test.

**Returns:**

TRUE if capability available otherwise FALSE.

References OGR\_Dr\_TestCapability().

Referenced by OGR\_Dr\_TestCapability().

### 17.9.2.5 OGRLayerH OGR\_DS\_CreateLayer (OGRDataSourceH *hDS*, const char \* *pszName*, OGRSpatialReferenceH *hSpatialRef*, OGRwkbGeometryType *eType*, char \*\* *papszOptions*)

This function attempts to create a new layer on the data source with the indicated name, coordinate system, geometry type. The papszOptions argument can be used to control driver specific creation options. These options are normally documented in the format specific documentation.

This function is the same as the C++ method **OGRDataSource::CreateLayer()** (p. 90).

**Parameters:**

*hDS* The dataset handle.

*pszName* the name for the new layer. This should ideally not match any existing layer on the data-source.

*hSpatialRef* handle to the coordinate system to use for the new layer, or NULL if no coordinate system is available.

*eType* the geometry type for the layer. Use wkbUnknown if there are no constraints on the types geometry to be written.

*papszOptions* a StringList of name=value options. Options are driver specific, and driver information can be found at the following url: [http://www.gdal.org/ogr/ogr\\_formats.html](http://www.gdal.org/ogr/ogr_formats.html)

**Returns:**

NULL is returned on failure, or a new **OGRLayer** (p. 156) handle on success.

**Example:**

```
#include "ogr_sfrmts.h"
#include "cpl_string.h"

...

OGRLayerH *hLayer;
char      *papszOptions;

if( OGR_DS_TestCapability( hDS, ODS_CreateLayer ) )
{
    ...
}

papszOptions = CSLSetNameValue( papszOptions, "DIM", "2" );
hLayer = OGR_DS_CreateLayer( hDS, "NewLayer", NULL, wkbUnknown,
                             papszOptions );
```

```

CSLDestroy( papszOptions );

if( hLayer == NULL )
{
    ...
}

```

References OGR\_DS\_CreateLayer().

Referenced by OGR\_DS\_CreateLayer().

#### 17.9.2.6 OGRLayerH OGR\_DS\_ExecuteSQL (OGRDataSourceH *hDS*, const char \* *pszSQLCommand*, OGRGeometryH *hSpatialFilter*, const char \* *pszDialect*)

Execute an SQL statement against the data store.

The result of an SQL query is either NULL for statements that are in error, or that have no results set, or an **OGRLayer** (p. 156) handle representing a results set from the query. Note that this **OGRLayer** (p. 156) is in addition to the layers in the data store and must be destroyed with OGR\_DS\_ReleaseResultsSet() before the data source is closed (destroyed).

For more information on the SQL dialect supported internally by OGR review the OGR SQL document. Some drivers (ie. Oracle and PostGIS) pass the SQL directly through to the underlying RDBMS.

This function is the same as the C++ method **OGRDataSource::ExecuteSQL()** (p. 92);

##### Parameters:

*hDS* handle to the data source on which the SQL query is executed.

*pszSQLCommand* the SQL statement to execute.

*hSpatialFilter* handle to a geometry which represents a spatial filter.

*pszDialect* allows control of the statement dialect. By default it is assumed to be "generic" SQL, whatever that is.

##### Returns:

an handle to a **OGRLayer** (p. 156) containing the results of the query. Deallocate with OGR\_DS\_ReleaseResultsSet().

References OGR\_DS\_ExecuteSQL().

Referenced by OGR\_DS\_ExecuteSQL().

#### 17.9.2.7 OGRLayerH OGR\_DS\_GetLayer (OGRDataSourceH *hDS*, int *iLayer*)

Fetch a layer by index. The returned layer remains owned by the **OGRDataSource** (p. 90) and should not be deleted by the application.

This function is the same as the C++ method **OGRDataSource::GetLayer()** (p. 93).

##### Parameters:

*hDS* handle to the data source from which to get the layer.

*iLayer* a layer number between 0 and **OGR\_DS\_GetLayerCount()** (p. 329)-1.

##### Returns:

an handle to the layer, or NULL if *iLayer* is out of range or an error occurs.

References OGR\_DS\_GetLayer().

Referenced by OGR\_DS\_GetLayer().

#### 17.9.2.8 OGRLayerH OGR\_DS\_GetLayerByName (OGRDataSourceH *hDS*, const char \* *pszLayerName*)

Fetch a layer by name. The returned layer remains owned by the **OGRDataSource** (p. 90) and should not be deleted by the application.

This function is the same as the C++ method **OGRDataSource::GetLayerByName()** (p. 93).

##### Parameters:

*hDS* handle to the data source from which to get the layer.

*psz* Layer the layer name of the layer to fetch.

##### Returns:

an handle to the layer, or NULL if the layer is not found or an error occurs.

References OGR\_DS\_GetLayerByName().

Referenced by OGR\_DS\_GetLayerByName().

#### 17.9.2.9 int OGR\_DS\_GetLayerCount (OGRDataSourceH *hDS*)

Get the number of layers in this data source.

This function is the same as the C++ method **OGRDataSource::GetLayerCount()** (p. 93).

##### Parameters:

*hDS* handle to the data source from which to get the number of layers.

##### Returns:

layer count.

References OGR\_DS\_GetLayerCount().

Referenced by OGR\_DS\_GetLayerCount().

#### 17.9.2.10 const char \* OGR\_DS\_GetName (OGRDataSourceH *hDS*)

Returns the name of the data source. This string should be sufficient to open the data source if passed to the same **OGRSFDriver** (p. 211) that this data source was opened with, but it need not be exactly the same string that was used to open the data source. Normally this is a filename.

This function is the same as the C++ method **OGRDataSource::GetName()** (p. 93).

##### Parameters:

*hDS* handle to the data source to get the name from.

---

**Returns:**

pointer to an internal name string which should not be modified or freed by the caller.

References OGR\_DS\_GetName().

Referenced by OGR\_DS\_GetName().

**17.9.2.11 void OGR\_DS\_ReleaseResultSet (OGRDataSourceH *hDS*, OGRLayerH *hLayer*)**

Release results of **OGR\_DS\_ExecuteSQL()** (p. 328).

This function should only be used to deallocate OGRLayers resulting from an **OGR\_DS\_ExecuteSQL()** (p. 328) call on the same **OGRDataSource** (p. 90). Failure to deallocate a results set before destroying the **OGRDataSource** (p. 90) may cause errors.

This function is the same as the C++ method **OGRDataSource::ReleaseResultSet()**.

**Parameters:**

***hDS*** an handle to the data source on which was executed an SQL query.

***hLayer*** handle to the result of a previous **OGR\_DS\_ExecuteSQL()** (p. 328) call.

References OGR\_DS\_ReleaseResultSet().

Referenced by OGR\_DS\_ReleaseResultSet().

**17.9.2.12 int OGR\_DS\_TestCapability (OGRDataSourceH *hDS*, const char \* *pszCapability*)**

Test if capability is available.

One of the following data source capability names can be passed into this function, and a TRUE or FALSE value will be returned indicating whether or not the capability is available for this object.

- **ODsCreateLayer**: True if this datasource can create new layers.

The define macro forms of the capability names should be used in preference to the strings themselves to avoid misspelling.

This function is the same as the C++ method **OGRDataSource::TestCapability()** (p. 96).

**Parameters:**

***hDS*** handle to the data source against which to test the capability.

***pszCapability*** the capability to test.

**Returns:**

TRUE if capability available otherwise FALSE.

References OGR\_DS\_TestCapability().

Referenced by OGR\_DS\_TestCapability().

---

### 17.9.2.13 OGRFeatureH OGR\_F\_Clone (OGRFeatureH *hFeat*)

Duplicate feature.

The newly created feature is owned by the caller, and will have it's own reference to the **OGRFeatureDefn** (p. 113).

This function is the same as the C++ method **OGRFeature::Clone()** (p. 100).

#### Parameters:

*hFeat* handle to the feature to clone.

#### Returns:

an handle to the new feature, exactly matching this feature.

References OGR\_F\_Clone().

Referenced by OGR\_F\_Clone().

### 17.9.2.14 OGRFeatureH OGR\_F\_Create (OGRFeatureDefnH *hDefn*)

Feature factory.

Note that the **OGRFeature** (p. 99) will increment the reference count of it's defining **OGRFeatureDefn** (p. 113). Destruction of the **OGRFeatureDefn** (p. 113) before destruction of all OGRFeatures that depend on it is likely to result in a crash.

This function is the same as the C++ method **OGRFeature::OGRFeature()** (p. 100).

#### Parameters:

*hDefn* handle to the feature class (layer) definition to which the feature will adhere.

#### Returns:

an handle to the new feature object with null fields and no geometry.

References OGR\_F\_Create().

Referenced by OGR\_F\_Create().

### 17.9.2.15 void OGR\_F\_Destroy (OGRFeatureH *hFeat*)

Destroy feature

The feature is deleted, but within the context of the GDAL/OGR heap. This is necessary when higher level applications use GDAL/OGR from a DLL and they want to delete a feature created within the DLL. If the delete is done in the calling application the memory will be freed onto the application heap which is inappropriate.

This function is the same as the C++ method **OGRFeature::DestroyFeature()** (p. 101).

#### Parameters:

*hFeat* handle to the feature to destroy.

References OGR\_F\_Destroy().

Referenced by OGR\_F\_Destroy().

---

**17.9.2.16 void OGR\_F\_DumpReadable (OGRFeatureH *hFeat*, FILE \**fpOut*)**

Dump this feature in a human readable form.

This dumps the attributes, and geometry; however, it doesn't definition information (other than field types and names), nor does it report the geometry spatial reference system.

This function is the same as the C++ method **OGRFeature::DumpReadable()** (p. 101).

**Parameters:**

*hFeat* handle to the feature to dump.

*fpOut* the stream to write to, such as strout.

References OGR\_F\_DumpReadable().

Referenced by OGR\_F\_DumpReadable().

**17.9.2.17 int OGR\_F\_Equal (OGRFeatureH *hFeat*, OGRFeatureH *hOtherFeat*)**

Test if two features are the same.

Two features are considered equal if the share them (handle equality) same **OGRFeatureDefn** (p. 113), have the same field values, and the same geometry (as tested by OGR\_G\_Equal()) as well as the same feature id.

This function is the same as the C++ method **OGRFeature::Equal()** (p. 101).

**Parameters:**

*hFeat* handle to one of the feature.

*hOtherFeat* handle to the other feature to test this one against.

**Returns:**

TRUE if they are equal, otherwise FALSE.

References OGR\_F\_Equal().

Referenced by OGR\_F\_Equal().

**17.9.2.18 OGRFeatureDefnH OGR\_F\_GetDefnRef (OGRFeatureH *hFeat*)**

Fetch feature definition.

This function is the same as the C++ method **OGRFeature::GetDefnRef()** (p. 102).

**Parameters:**

*hFeat* handle to the feature to get the feature definition from.

**Returns:**

an handle to the feature definition object on which feature depends.

References OGR\_F\_GetDefnRef().

Referenced by OGR\_F\_GetDefnRef().

---

**17.9.2.19 long OGR\_F\_GetFID (OGRFeatureH *hFeat*)**

Get feature identifier.

This function is the same as the C++ method **OGRFeature::GetFID()** (p. 102).

**Parameters:**

*hFeat* handle to the feature from which to get the feature identifier.

**Returns:**

feature id or OGRNullFID if none has been assigned.

References OGR\_F\_GetFID().

Referenced by OGR\_F\_GetFID().

**17.9.2.20 GByte\* OGR\_F\_GetFieldAsBinary (OGRFeatureH *hFeat*, int *iField*, int \* *pnBytes*)**

Fetch field value as binary.

Currently this method only works for OFTBinary fields.

This function is the same as the C++ method **OGRFeature::GetFieldAsBinary()** (p. 102).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

*pnBytes* location to place count of bytes returned.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief.

References OGR\_F\_GetFieldAsBinary().

Referenced by OGR\_F\_GetFieldAsBinary().

**17.9.2.21 int OGR\_F\_GetFieldAsDateTime (OGRFeatureH *hFeat*, int *iField*, int \* *pnYear*, int \* *pnMonth*, int \* *pnDay*, int \* *pnHour*, int \* *pnMinute*, int \* *pnSecond*, int \* *pnTZFlag*)**

Fetch field value as date and time.

Currently this method only works for OFTDate, OFTTime and OFTDateTime fields.

This function is the same as the C++ method **OGRFeature::GetFieldAsDateTime()** (p. 102).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

*int* *pnYear* (including century)

*int* *pnMonth* (1-12)

---

*int* pnDay (1-31)  
*int* pnHour (0-23)  
*int* pnMinute (0-59)  
*int* pnSecond (0-59)  
*int* pnTZFlag (0=unknown, 1=localtime, 100=GMT, see data model for details)

**Returns:**

TRUE on success or FALSE on failure.

References OGR\_F\_GetFieldAsDateTime().

Referenced by OGR\_F\_GetFieldAsDateTime().

**17.9.2.22 double OGR\_F\_GetFieldAsDouble (OGRFeatureH hFeat, int iField)**

Fetch field value as a double.

OFTString features will be translated using atof(). OFTInteger fields will be cast to double. Other field types, or errors will result in a return value of zero.

This function is the same as the C++ method **OGRFeature::GetFieldAsDouble()** (p. 103).

**Parameters:**

*hFeat* handle to the feature that owned the field.  
*iField* the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

the field value.

References OGR\_F\_GetFieldAsDouble().

Referenced by OGR\_F\_GetFieldAsDouble().

**17.9.2.23 const double\* OGR\_F\_GetFieldAsDoubleList (OGRFeatureH hFeat, int iField, int \*pnCount)**

Fetch field value as a list of doubles.

Currently this function only works for OFTRealList fields.

This function is the same as the C++ method **OGRFeature::GetFieldAsDoubleList()** (p. 103).

**Parameters:**

*hFeat* handle to the feature that owned the field.  
*iField* the field to fetch, from 0 to GetFieldCount()-1.  
*pnCount* an integer to put the list count (number of doubles) into.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief. If \*pnCount is zero on return the returned pointer may be NULL or non-NULL.

References OGR\_F\_GetFieldAsDoubleList().

Referenced by OGR\_F\_GetFieldAsDoubleList().

**17.9.2.24 int OGR\_F\_GetFieldAsInteger (OGRFeatureH *hFeat*, int *iField*)**

Fetch field value as integer.

OFTString features will be translated using atoi(). OFTReal fields will be cast to integer. Other field types, or errors will result in a return value of zero.

This function is the same as the C++ method **OGRFeature::GetFieldAsInteger()** (p. 104).

**Parameters:**

***hFeat*** handle to the feature that owned the field.

***iField*** the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

the field value.

References OGR\_F\_GetFieldAsInteger().

Referenced by OGR\_F\_GetFieldAsInteger().

**17.9.2.25 const int\* OGR\_F\_GetFieldAsIntegerList (OGRFeatureH *hFeat*, int *iField*, int \*  
*pnCount*)**

Fetch field value as a list of integers.

Currently this function only works for OFTIntegerList fields.

This function is the same as the C++ method **OGRFeature::GetFieldAsIntegerList()** (p. 104).

**Parameters:**

***hFeat*** handle to the feature that owned the field.

***iField*** the field to fetch, from 0 to GetFieldCount()-1.

***pnCount*** an integer to put the list count (number of integers) into.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief. If \*pnCount is zero on return the returned pointer may be NULL or non-NULL.

References OGR\_F\_GetFieldAsIntegerList().

Referenced by OGR\_F\_GetFieldAsIntegerList().

**17.9.2.26 const char\* OGR\_F\_GetFieldAsString (OGRFeatureH *hFeat*, int *iField*)**

Fetch field value as a string.

OFTReal and OFTInteger fields will be translated to string using sprintf(), but not necessarily using the established formatting rules. Other field types, or errors will result in a return value of zero.

This function is the same as the C++ method **OGRFeature::GetFieldAsString()** (p. 104).

**Parameters:**

***hFeat*** handle to the feature that owned the field.

---

*iField* the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

the field value. This string is internal, and should not be modified, or freed. It's lifetime may be very brief.

References OGR\_F\_GetFieldAsString().

Referenced by OGR\_F\_GetFieldAsString().

**17.9.2.27 char\*\* OGR\_F\_GetFieldAsStringList (OGRFeatureH hFeat, int iField)**

Fetch field value as a list of strings.

Currently this method only works for OFTStringList fields.

This function is the same as the C++ method **OGRFeature::GetFieldAsStringList()** (p. 105).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

the field value. This list is internal, and should not be modified, or freed. It's lifetime may be very brief.

References OGR\_F\_GetFieldAsStringList().

Referenced by OGR\_F\_GetFieldAsStringList().

**17.9.2.28 int OGR\_F\_GetFieldCount (OGRFeatureH hFeat)**

Fetch number of fields on this feature. This will always be the same as the field count for the **OGRFeatureDefn** (p. 113).

This function is the same as the C++ method **OGRFeature::GetFieldCount()** (p. 105).

**Parameters:**

*hFeat* handle to the feature to get the fields count from.

**Returns:**

count of fields.

References OGR\_F\_GetFieldCount().

Referenced by OGR\_F\_GetFieldCount().

**17.9.2.29 OGRFieldDefnH OGR\_F\_GetFieldDefnRef (OGRFeatureH hFeat, int i)**

Fetch definition for this field.

This function is the same as the C++ method **OGRFeature::GetFieldDefnRef()** (p. 105).

---

**Parameters:**

*hFeat* handle to the feature on which the field is found.

*i* the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

an handle to the field definition (from the **OGRFeatureDefn** (p. 113)). This is an internal reference, and should not be deleted or modified.

References OGR\_F\_GetFieldDefnRef().

Referenced by OGR\_F\_GetFieldDefnRef().

**17.9.2.30 int OGR\_F\_GetFieldIndex (OGRFeatureH hFeat, const char \* pszName)**

Fetch the field index given field name.

This is a cover for the **OGRFeatureDefn::GetFieldIndex()** (p. 115) method.

This function is the same as the C++ method **OGRFeature::GetFieldIndex()** (p. 106).

**Parameters:**

*hFeat* handle to the feature on which the field is found.

*pszName* the name of the field to search for.

**Returns:**

the field index, or -1 if no matching field is found.

References OGR\_F\_GetFieldIndex().

Referenced by OGR\_F\_GetFieldIndex().

**17.9.2.31 OGRGeometryH OGR\_F\_GetGeometryRef (OGRFeatureH hFeat)**

Fetch an handle to feature geometry.

This function is the same as the C++ method **OGRFeature::GetGeometryRef()** (p. 106).

**Parameters:**

*hFeat* handle to the feature to get geometry from.

**Returns:**

an handle to internal feature geometry. This object should not be modified.

References OGR\_F\_GetGeometryRef().

Referenced by OGR\_F\_GetGeometryRef().

**17.9.2.32 OGRField\* OGR\_F\_GetRawFieldRef (OGRFeatureH hFeat, int iField)**

Fetch an handle to the internal field value given the index.

This function is the same as the C++ method **OGRFeature::GetRawFieldRef()** (p. 106).

**Parameters:**

*hFeat* handle to the feature on which field is found.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

**Returns:**

the returned handle is to an internal data structure, and should not be freed, or modified.

References OGR\_F\_GetRawFieldRef().

Referenced by OGR\_F\_GetRawFieldRef().

**17.9.2.33 const char\* OGR\_F\_GetStyleString (OGRFeatureH hFeat)**

Fetch style string for this feature.

Set the OGR Feature Style Specification for details on the format of this string, and **ogr\_featurestyle.h** (p. ??) for services available to parse it.

This function is the same as the C++ method **OGRFeature::GetStyleString()** (p. 107).

**Parameters:**

*hFeat* handle to the feature to get the style from.

**Returns:**

a reference to a representation in string format, or NULL if there isn't one.

References OGR\_F\_GetStyleString().

Referenced by OGR\_F\_GetStyleString().

**17.9.2.34 int OGR\_F\_IsFieldSet (OGRFeatureH hFeat, int iField)**

Test if a field has ever been assigned a value or not.

This function is the same as the C++ method **OGRFeature::IsFieldSet()**.

**Parameters:**

*hFeat* handle to the feature on which the field is.

*iField* the field to test.

**Returns:**

TRUE if the field has been set, otherwise false.

References OGR\_F\_IsFieldSet().

Referenced by OGR\_F\_IsFieldSet().

**17.9.2.35 OGRErr OGR\_F\_SetFID (OGRFeatureH hFeat, long nFID)**

Set the feature identifier.

---

For specific types of features this operation may fail on illegal features ids. Generally it always succeeds. Feature ids should be greater than or equal to zero, with the exception of OGRNullFID (-1) indicating that the feature id is unknown.

This function is the same as the C++ method **OGRFeature::SetFID()** (p. 107).

**Parameters:**

*hFeat* handle to the feature to set the feature id to.

*nFID* the new feature identifier value to assign.

**Returns:**

On success OGRERR\_NONE, or on failure some other value.

References OGR\_F\_SetFID().

Referenced by OGR\_F\_SetFID().

### 17.9.2.36 void OGR\_F\_SetFieldBinary (OGRFeatureH *hFeat*, int *iField*, int *nBytes*, GByte \* *pabyData*)

Set field to binary data.

This function currently on has an effect of OFTBinary fields.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to set, from 0 to GetFieldCount()-1.

*nBytes* the number of bytes in pabyData array.

*pabyData* the data to apply.

References OGR\_F\_SetFieldBinary().

Referenced by OGR\_F\_SetFieldBinary().

### 17.9.2.37 void OGR\_F\_SetFieldDateTime (OGRFeatureH *hFeat*, int *iField*, int *nYear*, int *nMonth*, int *nDay*, int *nHour*, int *nMinute*, int *nSecond*, int *nTZFlag*)

Set field to datetime.

This method currently only has an effect for OFTDate, OFTTime and OFTDateTime fields.

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to set, from 0 to GetFieldCount()-1.

*nYear* (including century)

*nMonth* (1-12)

*nDay* (1-31)

*nHour* (0-23)

*nMinute* (0-59)

*nSecond* (0-59)

*nTZFlag* (0=unknown, 1=localtime, 100=GMT, see data model for details)

References OGR\_F\_SetFieldDateTime().

Referenced by OGR\_F\_SetFieldDateTime().

#### 17.9.2.38 void OGR\_F\_SetFieldDouble (OGRFeatureH *hFeat*, int *iField*, double *dfValue*)

Set field to double value.

OFTInteger and OFTReal fields will be set directly. OFTString fields will be assigned a string representation of the value, but not necessarily taking into account formatting constraints on this field. Other field types may be unaffected.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

##### Parameters:

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

*dfValue* the value to assign.

References OGR\_F\_SetFieldDouble().

Referenced by OGR\_F\_SetFieldDouble().

#### 17.9.2.39 void OGR\_F\_SetFieldDoubleList (OGRFeatureH *hFeat*, int *iField*, int *nCount*, double \* *padfValues*)

Set field to list of doubles value.

This function currently on has an effect of OFTRealList fields.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

##### Parameters:

*hFeat* handle to the feature that owned the field.

*iField* the field to set, from 0 to GetFieldCount()-1.

*nCount* the number of values in the list being assigned.

*padfValues* the values to assign.

References OGR\_F\_SetFieldDoubleList().

Referenced by OGR\_F\_SetFieldDoubleList().

#### 17.9.2.40 void OGR\_F\_SetFieldInteger (OGRFeatureH *hFeat*, int *iField*, int *nValue*)

Set field to integer value.

OFTInteger and OFTReal fields will be set directly. OFTString fields will be assigned a string representation of the value, but not necessarily taking into account formatting constraints on this field. Other field types may be unaffected.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

*nValue* the value to assign.

References OGR\_F\_SetFieldInteger().

Referenced by OGR\_F\_SetFieldInteger().

**17.9.2.41 void OGR\_F\_SetFieldIntegerList (OGRFeatureH hFeat, int iField, int nCount, int \* panValues)**

Set field to list of integers value.

This function currently on has an effect of OFTIntegerList fields.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to set, from 0 to GetFieldCount()-1.

*nCount* the number of values in the list being assigned.

*panValues* the values to assign.

References OGR\_F\_SetFieldIntegerList().

Referenced by OGR\_F\_SetFieldIntegerList().

**17.9.2.42 void OGR\_F\_SetFieldRaw (OGRFeatureH hFeat, int iField, OGRField \* psValue)**

Set field.

The passed value **OGRField** (p. 118) must be of exactly the same type as the target field, or an application crash may occur. The passed value is copied, and will not be affected. It remains the responsibility of the caller.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

*hFeat* handle to the feature that owned the field.

*iField* the field to fetch, from 0 to GetFieldCount()-1.

*psValue* handle on the value to assign.

References OGR\_F\_SetFieldRaw().

Referenced by OGR\_F\_SetFieldRaw().

---

**17.9.2.43 void OGR\_F\_SetFieldString (OGRFeatureH *hFeat*, int *iField*, const char \* *pszValue*)**

Set field to string value.

OFTInteger fields will be set based on an atoi() conversion of the string. OFTReal fields will be set based on an atof() conversion of the string. Other field types may be unaffected.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

***hFeat*** handle to the feature that owned the field.

***iField*** the field to fetch, from 0 to GetFieldCount()-1.

***pszValue*** the value to assign.

References OGR\_F\_SetFieldString().

Referenced by OGR\_F\_SetFieldString().

**17.9.2.44 void OGR\_F\_SetFieldStringList (OGRFeatureH *hFeat*, int *iField*, char \*\* *papszValues*)**

Set field to list of strings value.

This function currently on has an effect of OFTStringList fields.

This function is the same as the C++ method **OGRFeature::SetField()** (p. 110).

**Parameters:**

***hFeat*** handle to the feature that owned the field.

***iField*** the field to set, from 0 to GetFieldCount()-1.

***papszValues*** the values to assign.

References OGR\_F\_SetFieldStringList().

Referenced by OGR\_F\_SetFieldStringList().

**17.9.2.45 OGRErr OGR\_F\_SetFrom (OGRFeatureH *hFeat*, OGRFeatureH *hOtherFeat*, int *bForgiving*)**

Set one feature from another.

Overwrite the contents of this feature from the geometry and attributes of another. The *hOtherFeature* does not need to have the same **OGRFeatureDefn** (p. 113). Field values are copied by corresponding field names. Field types do not have to exactly match. OGR\_F\_SetField\*() function conversion rules will be applied as needed.

This function is the same as the C++ method **OGRFeature::SetFrom()** (p. 110).

**Parameters:**

***hFeat*** handle to the feature to set to.

***hOtherFeat*** handle to the feature from which geometry, and field values will be copied.

***bForgiving*** TRUE if the operation should continue despite lacking output fields matching some of the source fields.

---

**Returns:**

OGRERR\_NONE if the operation succeeds, even if some values are not transferred, otherwise an error code.

References OGR\_F\_SetFrom().

Referenced by OGR\_F\_SetFrom().

**17.9.2.46 OGRERR OGR\_F\_SetGeometry (OGRFeatureH *hFeat*, OGRGeometryH *hGeom*)**

Set feature geometry.

This function updates the features geometry, and operate exactly as SetGeometryDirectly(), except that this function does not assume ownership of the passed geometry, but instead makes a copy of it.

This function is the same as the C++ **OGRFeature::SetGeometry()** (p. 111).

**Parameters:**

***hFeat*** handle to the feature on which new geometry is applied to.

***hGeom*** handle to the new geometry to apply to feature.

**Returns:**

OGRERR\_NONE if successful, or OGR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the **OGRFeatureDefn** (p. 113) (checking not yet implemented).

References OGR\_F\_SetGeometry().

Referenced by OGR\_F\_SetGeometry().

**17.9.2.47 OGRERR OGR\_F\_SetGeometryDirectly (OGRFeatureH *hFeat*, OGRGeometryH *hGeom*)**

Set feature geometry.

This function updates the features geometry, and operate exactly as SetGeometry(), except that this function assumes ownership of the passed geometry.

This function is the same as the C++ method **OGRFeature::SetGeometryDirectly** (p. 111).

**Parameters:**

***hFeat*** handle to the feature on which to apply the geometry.

***hGeom*** handle to the new geometry to apply to feature.

**Returns:**

OGRERR\_NONE if successful, or OGR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the **OGRFeatureDefn** (p. 113) (checking not yet implemented).

References OGR\_F\_SetGeometryDirectly().

Referenced by OGR\_F\_SetGeometryDirectly().

---

**17.9.2.48 void OGR\_F\_SetStyleString (OGRFeatureH *hFeat*, const char \* *pszStyle*)**

Set feature style string. This method operate exactly as **OGR\_F\_SetStyleStringDirectly()** (p. 344) except that it does not assume ownership of the passed string, but instead makes a copy of it.

This function is the same as the C++ method **OGRFeature::SetStyleString()** (p. 111).

**Parameters:**

***hFeat*** handle to the feature to set style to.

***pszStyle*** the style string to apply to this feature, cannot be NULL.

References OGR\_F\_SetStyleString().

Referenced by OGR\_F\_SetStyleString().

**17.9.2.49 void OGR\_F\_SetStyleStringDirectly (OGRFeatureH *hFeat*, char \* *pszStyle*)**

Set feature style string. This method operate exactly as **OGR\_F\_SetStyleString()** (p. 344) except that it assumes ownership of the passed string.

This function is the same as the C++ method **OGRFeature::SetStyleStringDirectly()** (p. 112).

**Parameters:**

***hFeat*** handle to the feature to set style to.

***pszStyle*** the style string to apply to this feature, cannot be NULL.

References OGR\_F\_SetStyleStringDirectly().

Referenced by OGR\_F\_SetStyleStringDirectly().

**17.9.2.50 void OGR\_F\_UnsetField (OGRFeatureH *hFeat*, int *iField*)**

Clear a field, marking it as unset.

This function is the same as the C++ method **OGRFeature::UnsetField()** (p. 112).

**Parameters:**

***hFeat*** handle to the feature on which the field is.

***iField*** the field to unset.

References OGR\_F\_UnsetField().

Referenced by OGR\_F\_UnsetField().

**17.9.2.51 void OGR\_FD\_AddFieldDefn (OGRFeatureDefnH *hDefn*, OGRFieldDefnH *hNewField*)**

Add a new field definition to the passed feature definition.

This function should only be called while there are no **OGRFeature** (p. 99) objects in existence based on this **OGRFeatureDefn** (p. 113). The **OGRFieldDefn** (p. 119) passed in is copied, and remains the responsibility of the caller.

This function is the same as the C++ method **OGRFeatureDefn::AddFieldDefn** (p. 114).

---

**Parameters:**

*hDefn* handle to the feature definition to add the field definition to.

*hNewField* handle to the new field definition.

References OGR\_FD\_AddFieldDefn().

Referenced by OGR\_FD\_AddFieldDefn().

**17.9.2.52 OGRFeatureDefnH OGR\_FD\_Create (const char \* pszName)**

Create a new feature definition object to hold the field definitions.

The **OGRFeatureDefn** (p. 113) maintains a reference count, but this starts at zero, and should normally be incremented by the owner.

This function is the same as the C++ method **OGRFeatureDefn::OGRFeatureDefn()** (p. 113).

**Parameters:**

*pszName* the name to be assigned to this layer/class. It does not need to be unique.

**Returns:**

handle to the newly created feature definition.

References OGR\_FD\_Create().

Referenced by OGR\_FD\_Create().

**17.9.2.53 int OGR\_FD\_Dereference (OGRFeatureDefnH hDefn)**

Decrements the reference count by one.

This function is the same as the C++ method **OGRFeatureDefn::Dereference()** (p. 114).

**Parameters:**

*hDefn* handle to the feature definition on which **OGRFeature** (p. 99) are based on.

**Returns:**

the updated reference count.

References OGR\_FD\_Dereference().

Referenced by OGR\_FD\_Dereference().

**17.9.2.54 void OGR\_FD\_Destroy (OGRFeatureDefnH hDefn)**

Destroy a feature definition object and release all memory associated with it.

This function is the same as the C++ method **OGRFeatureDefn::~~OGRFeatureDefn()**.

**Parameters:**

*hDefn* handle to the feature definition to be destroyed.

References OGR\_FD\_Destroy().

Referenced by OGR\_FD\_Destroy().

---

**17.9.2.55 int OGR\_FD\_GetFieldCount (OGRFeatureDefnH *hDefn*)**

Fetch number of fields on the passed feature definition.

This function is the same as the C++ **OGRFeatureDefn::GetFieldCount()** (p. 114).

**Parameters:**

*hDefn* handle to the feature definition to get the fields count from.

**Returns:**

count of fields.

References OGR\_FD\_GetFieldCount().

Referenced by OGR\_FD\_GetFieldCount().

**17.9.2.56 OGRFieldDefnH OGR\_FD\_GetFieldDefn (OGRFeatureDefnH *hDefn*, int *iField*)**

Fetch field definition of the passed feature definition.

This function is the same as the C++ method **OGRFeatureDefn::GetFieldDefn()** (p. 115).

**Parameters:**

*hDefn* handle to the feature definition to get the field definition from.

*iField* the field to fetch, between 0 and GetFieldCount()-1.

**Returns:**

an handle to an internal field definition object. This object should not be modified or freed by the application.

References OGR\_FD\_GetFieldDefn().

Referenced by OGR\_FD\_GetFieldDefn().

**17.9.2.57 int OGR\_FD\_GetFieldIndex (OGRFeatureDefnH *hDefn*, const char \* *pszFieldName*)**

Find field by name.

The field index of the first field matching the passed field name (case insensitively) is returned.

This function is the same as the C++ method **OGRFeatureDefn::GetFieldIndex** (p. 115).

**Parameters:**

*hDefn* handle to the feature definition to get field index from.

*pszFieldName* the field name to search for.

**Returns:**

the field index, or -1 if no match found.

References OGR\_FD\_GetFieldIndex().

Referenced by OGR\_FD\_GetFieldIndex().

---

**17.9.2.58 OGRwkbGeometryType OGR\_FD\_GetGeomType (OGRFieldDefnH *hDefn*)**

Fetch the geometry base type of the passed feature definition.

This function is the same as the C++ method **OGRFeatureDefn::GetGeomType()** (p. 115).

**Parameters:**

*hDefn* handle to the feature definition to get the geometry type from.

**Returns:**

the base type for all geometry related to this definition.

References OGR\_FD\_GetGeomType().

Referenced by OGR\_FD\_GetGeomType().

**17.9.2.59 const char\* OGR\_FD\_GetName (OGRFeatureDefnH *hDefn*)**

Get name of the **OGRFeatureDefn** (p. 113) passed as an argument.

This function is the same as the C++ method **OGRFeatureDefn::GetName()** (p. 116).

**Parameters:**

*hDefn* handle to the feature definition to get the name from.

**Returns:**

the name. This name is internal and should not be modified, or freed.

References OGR\_FD\_GetName().

Referenced by OGR\_FD\_GetName().

**17.9.2.60 int OGR\_FD\_GetReferenceCount (OGRFeatureDefnH *hDefn*)**

Fetch current reference count.

This function is the same as the C++ method **OGRFeatureDefn::GetReferenceCount()** (p. 116).

**Parameters:**

*hDefn* handle to the feature definition on which **OGRFeature** (p. 99) are based on.

**Returns:**

the current reference count.

References OGR\_FD\_GetReferenceCount().

Referenced by OGR\_FD\_GetReferenceCount().

---

**17.9.2.61 int OGR\_FD\_Reference (OGRFeatureDefnH *hDefn*)**

Increments the reference count by one.

The reference count is used keep track of the number of **OGRFeature** (p. 99) objects referencing this definition.

This function is the same as the C++ method **OGRFeatureDefn::Reference()** (p. 116).

**Parameters:**

*hDefn* handle to the feature definition on witch **OGRFeature** (p. 99) are based on.

**Returns:**

the updated reference count.

References OGR\_FD\_Reference().

Referenced by OGR\_FD\_Reference().

**17.9.2.62 void OGR\_FD\_Release (OGRFeatureDefnH *hDefn*)**

Drop a reference, and destroy if unreferenced.

This function is the same as the C++ method **OGRFeatureDefn::Release()** (p. 116).

**Parameters:**

*hDefn* handle to the feature definition to be released.

References OGR\_FD\_Release().

Referenced by OGR\_FD\_Release().

**17.9.2.63 void OGR\_FD\_SetGeomType (OGRFeatureDefnH *hDefn*, OGRwkbGeometryType *eType*)**

Assign the base geometry type for the passed layer (the same as the feature definition).

All geometry objects using this type must be of the defined type or a derived type. The default upon creation is wkbUnknown which allows for any geometry type. The geometry type should generally not be changed after any OGRFeatures have been created against this definition.

This function is the same as the C++ method **OGRFeatureDefn::SetGeomType()** (p. 116).

**Parameters:**

*hDefn* handle to the layer or feature definition to set the geometry type to.

*eType* the new type to assign.

References OGR\_FD\_SetGeomType().

Referenced by OGR\_FD\_SetGeomType().

---

**17.9.2.64 OGRFieldDefnH OGR\_Fld\_Create (const char \* *pszName*, OGRFieldType *eType*)**

Create a new field definition.

This function is the same as the CPP method **OGRFieldDefn::OGRFieldDefn()** (p. 119).

**Parameters:**

*pszName* the name of the new field definition.

*eType* the type of the new field definition.

**Returns:**

handle to the new field definition.

References OGR\_Fld\_Create().

Referenced by OGR\_Fld\_Create().

**17.9.2.65 void OGR\_Fld\_Destroy (OGRFieldDefnH *hDefn*)**

Destroy a field definition.

**Parameters:**

*hDefn* handle to the field definition to destroy.

References OGR\_Fld\_Destroy().

Referenced by OGR\_Fld\_Destroy().

**17.9.2.66 OGRJustification OGR\_Fld\_GetJustify (OGRFieldDefnH *hDefn*)**

Get the justification for this field.

This function is the same as the CPP method **OGRFieldDefn::GetJustify()** (p. 120).

**Parameters:**

*hDefn* handle to the field definition to get justification from.

**Returns:**

the justification.

References OGR\_Fld\_GetJustify().

Referenced by OGR\_Fld\_GetJustify().

**17.9.2.67 const char\* OGR\_Fld\_GetNameRef (OGRFieldDefnH *hDefn*)**

Fetch name of this field.

This function is the same as the CPP method **OGRFieldDefn::GetNameRef()** (p. 120).

---

**Parameters:**

*hDefn* handle to the field definition.

**Returns:**

the name of the field definition.

References OGR\_Fld\_GetNameRef().

Referenced by OGR\_Fld\_GetNameRef().

**17.9.2.68 int OGR\_Fld\_GetPrecision (OGRFieldDefnH *hDefn*)**

Get the formatting precision for this field. This should normally be zero for fields of types other than OFTReal.

This function is the same as the CPP method **OGRFieldDefn::GetPrecision()** (p. 120).

**Parameters:**

*hDefn* handle to the field definition to get precision from.

**Returns:**

the precision.

References OGR\_Fld\_GetPrecision().

Referenced by OGR\_Fld\_GetPrecision().

**17.9.2.69 OGRFieldType OGR\_Fld\_GetType (OGRFieldDefnH *hDefn*)**

Fetch type of this field.

This function is the same as the CPP method **OGRFieldDefn::GetType()** (p. 121).

**Parameters:**

*hDefn* handle to the field definition to get type from.

**Returns:**

field type.

References OGR\_Fld\_GetType().

Referenced by OGR\_Fld\_GetType().

**17.9.2.70 int OGR\_Fld\_GetWidth (OGRFieldDefnH *hDefn*)**

Get the formatting width for this field.

This function is the same as the CPP method **OGRFieldDefn::GetWidth()** (p. 121).

**Parameters:**

*hDefn* handle to the field definition to get width from.

---

**Returns:**

the width, zero means no specified width.

References OGR\_Fld\_GetWidth().

Referenced by OGR\_Fld\_GetWidth().

**17.9.2.71 void OGR\_Fld\_Set (OGRFieldDefnH *hDefn*, const char \* *pszNameIn*, OGRFieldType *eTypeIn*, int *nWidthIn*, int *nPrecisionIn*, OGRJustification *eJustifyIn*)**

Set defining parameters for a field in one call.

This function is the same as the CPP method **OGRFieldDefn::Set()** (p. 121).

**Parameters:**

***hDefn*** handle to the field definition to set to.

***pszNameIn*** the new name to assign.

***eTypeIn*** the new type (one of the OFT values like OFTInteger).

***nWidthIn*** the preferred formatting width. Defaults to zero indicating undefined.

***nPrecisionIn*** number of decimals places for formatting, defaults to zero indicating undefined.

***eJustifyIn*** the formatting justification (OJLeft or OJRight), defaults to OJUndefined.

References OGR\_Fld\_Set().

Referenced by OGR\_Fld\_Set().

**17.9.2.72 void OGR\_Fld\_SetJustify (OGRFieldDefnH *hDefn*, OGRJustification *eJustify*)**

Set the justification for this field.

This function is the same as the CPP method **OGRFieldDefn::SetJustify()** (p. 122).

**Parameters:**

***hDefn*** handle to the field definition to set justification to.

***eJustify*** the new justification.

References OGR\_Fld\_SetJustify().

Referenced by OGR\_Fld\_SetJustify().

**17.9.2.73 void OGR\_Fld\_SetName (OGRFieldDefnH *hDefn*, const char \* *pszName*)**

Reset the name of this field.

This function is the same as the CPP method **OGRFieldDefn::SetName()** (p. 122).

**Parameters:**

***hDefn*** handle to the field definition to apply the new name to.

***pszName*** the new name to apply.

References OGR\_Fld\_SetName().

Referenced by OGR\_Fld\_SetName().

---

**17.9.2.74 void OGR\_Fld\_SetPrecision (OGRFieldDefnH *hDefn*, int *nPrecision*)**

Set the formatting precision for this field in characters.

This should normally be zero for fields of types other than OFTReal.

This function is the same as the CPP method **OGRFieldDefn::SetPrecision()** (p. 122).

**Parameters:**

*hDefn* handle to the field definition to set precision to.

*nPrecision* the new precision.

References OGR\_Fld\_SetPrecision().

Referenced by OGR\_Fld\_SetPrecision().

**17.9.2.75 void OGR\_Fld\_SetType (OGRFieldDefnH *hDefn*, OGRFieldType *eType*)**

Set the type of this field. This should never be done to an **OGRFieldDefn** (p. 119) that is already part of an **OGRFeatureDefn** (p. 113).

This function is the same as the CPP method **OGRFieldDefn::SetType()** (p. 122).

**Parameters:**

*hDefn* handle to the field definition to set type to.

*eType* the new field type.

References OGR\_Fld\_SetType().

Referenced by OGR\_Fld\_SetType().

**17.9.2.76 void OGR\_Fld\_SetWidth (OGRFieldDefnH *hDefn*, int *nNewWidth*)**

Set the formatting width for this field in characters.

This function is the same as the CPP method **OGRFieldDefn::SetWidth()** (p. 123).

**Parameters:**

*hDefn* handle to the field definition to set width to.

*nNewWidth* the new width.

References OGR\_Fld\_SetWidth().

Referenced by OGR\_Fld\_SetWidth().

**17.9.2.77 OGRErr OGR\_G\_AddGeometry (OGRGeometryH *hGeom*, OGRGeometryH *hNewSubGeom*)**

Add a geometry to a geometry container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. The passed geometry is cloned to make an internal copy.

---

There is no SFCOM analog to this method.

This function is the same as the CPP method **OGRGeometryCollection::addGeometry** (p. 142).

**Parameters:**

*hGeom* existing geometry container.

*hNewSubGeom* geometry to add to the container.

**Returns:**

OGRERR\_NONE if successful, or OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of existing geometry.

References OGRLineString::getGeometryType(), wkbGeometryCollection, wkbLineString, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, wkbPolygon, and OGRLinearRing::WkbSize().

### 17.9.2.78 OGRErr OGR\_G\_AddGeometryDirectly (OGRGeometryH *hGeom*, OGRGeometryH *hNewSubGeom*)

Add a geometry directly to an existing geometry container.

Some subclasses of **OGRGeometryCollection** (p. 141) restrict the types of geometry that can be added, and may return an error. Ownership of the passed geometry is taken by the container rather than cloning as addGeometry() does.

This function is the same as the CPP method **OGRGeometryCollection::addGeometryDirectly** (p. 142).

There is no SFCOM analog to this method.

**Parameters:**

*hGeom* existing geometry.

*hNewSubGeom* geometry to add to the existing geometry.

**Returns:**

OGRERR\_NONE if successful, or OGRERR\_UNSUPPORTED\_GEOMETRY\_TYPE if the geometry type is illegal for the type of geometry container.

References OGRLineString::getGeometryType(), wkbGeometryCollection, wkbLineString, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, wkbPolygon, and OGRLinearRing::WkbSize().

### 17.9.2.79 void OGR\_G\_AddPoint (OGRGeometryH *hGeom*, double *dfX*, double *dfY*, double *dfZ*)

Add a point to a geometry (line string or point).

The vertex count of the line string is increased by one, and assigned from the passed location value.

**Parameters:**

*hGeom* handle to the geometry to add a point to.

*dfX* x coordinate of point to add.

*dfY* y coordinate of point to add.

*dfZ* z coordinate of point to add.

References wkbLineString, and wkbPoint.

**17.9.2.80 void OGR\_G\_AddPoint\_2D (OGRGeometryH *hGeom*, double *dfX*, double *dfY*)**

Add a point to a geometry (line string or point).

The vertex count of the line string is increased by one, and assigned from the passed location value.

**Parameters:**

*hGeom* handle to the geometry to add a point to.

*dfX* x coordinate of point to add.

*dfY* y coordinate of point to add.

References `wkbLineString`, and `wkbPoint`.

**17.9.2.81 void OGR\_G\_AssignSpatialReference (OGRGeometryH *hGeom*, OGRSpatialReferenceH *hSRS*)**

Assign spatial reference to this object. Any existing spatial reference is replaced, but under no circumstances does this result in the object being reprojected. It is just changing the interpretation of the existing geometry. Note that assigning a spatial reference increments the reference count on the **OGRSpatialReference** (p. 217), but does not copy it.

This is similar to the SFCOM `IGeometry::put_SpatialReference()` method.

This function is the same as the CPP method **OGRGeometry::assignSpatialReference** (p. 125).

**Parameters:**

*hGeom* handle on the geometry to apply the new spatial reference system.

*hSRS* handle on the new spatial reference system to apply.

References `OGR_G_AssignSpatialReference()`.

Referenced by `OGR_G_AssignSpatialReference()`.

**17.9.2.82 OGRGeometryH OGR\_G\_Clone (OGRGeometryH *hGeom*)**

Make a copy of this object.

This function relates to the SFCOM `IGeometry::clone()` method.

This function is the same as the CPP method **OGRGeometry::clone()** (p. 126).

**Parameters:**

*hGeom* handle on the geometry to clone from.

**Returns:**

an handle on the copy of the geometry with the spatial reference system as the original.

References `OGR_G_Clone()`.

Referenced by `OGR_G_Clone()`.

---

### 17.9.2.83 OGRErr OGR\_G\_CreateFromWkb (unsigned char \* *pabyData*, OGRSpatialReferenceH *hSRS*, OGRGeometryH \* *phGeometry*, int *nBytes*)

Create a geometry object of the appropriate type from it's well known binary representation.

Note that if *nBytes* is passed as zero, no checking can be done on whether the *pabyData* is sufficient. This can result in a crash if the input data is corrupt. This function returns no indication of the number of bytes from the data source actually used to represent the returned geometry object. Use **OGR\_G\_WkbSize()** (p. 366) on the returned geometry to establish the number of bytes it required in WKB format.

The **OGRGeometryFactory::createFromWkb()** (p. 151) CPP method is the same as this function.

#### Parameters:

*pabyData* pointer to the input BLOB data.

*hSRS* handle to the spatial reference to be assigned to the created geometry object. This may be NULL.

*phGeometry* the newly created geometry object will be assigned to the indicated handle on return. This will be NULL in case of failure.

*nBytes* the number of bytes of data available in *pabyData*, or -1 if it is not known, but assumed to be sufficient.

#### Returns:

OGRErr\_NONE if all goes well, otherwise any of OGRErr\_NOT\_ENOUGH\_DATA, OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRErr\_CORRUPT\_DATA may be returned.

References OGRGeometryFactory::createFromWkb(), and OGR\_G\_CreateFromWkb().

Referenced by OGR\_G\_CreateFromWkb().

### 17.9.2.84 OGRErr OGR\_G\_CreateFromWkt (char \*\* *ppszData*, OGRSpatialReferenceH *hSRS*, OGRGeometryH \* *phGeometry*)

Create a geometry object of the appropriate type from it's well known text representation.

The **OGRGeometryFactory::createFromWkt()** (p. 152) CPP method is the same as this function.

#### Parameters:

*ppszData* input zero terminated string containing well known text representation of the geometry to be created. The pointer is updated to point just beyond that last character consumed.

*hSRS* handle to the spatial reference to be assigned to the created geometry object. This may be NULL.

*phGeometry* the newly created geometry object will be assigned to the indicated handle on return. This will be NULL if the method fails.

#### Returns:

OGRErr\_NONE if all goes well, otherwise any of OGRErr\_NOT\_ENOUGH\_DATA, OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRErr\_CORRUPT\_DATA may be returned.

References OGRGeometryFactory::createFromWkt(), and OGR\_G\_CreateFromWkt().

Referenced by OGR\_G\_CreateFromWkt().

---

**17.9.2.85 OGRGeometryH OGR\_G\_CreateGeometry (OGRwkbGeometryType *eGeometryType*)**

Create an empty geometry of desired type.

This is equivalent to allocating the desired geometry with new, but the allocation is guaranteed to take place in the context of the GDAL/OGR heap.

This function is the same as the CPP method **OGRGeometryFactory::createGeometry** (p. 153).

**Parameters:**

*eGeometryType* the type code of the geometry to be created.

**Returns:**

handle to the newly create geometry or NULL on failure.

References OGRGeometryFactory::createGeometry(), and OGR\_G\_CreateGeometry().

Referenced by OGR\_G\_CreateGeometry().

**17.9.2.86 void OGR\_G\_DestroyGeometry (OGRGeometryH *hGeom*)**

Destroy geometry object.

Equivalent to invoking delete on a geometry, but it guaranteed to take place within the context of the GDAL/OGR heap.

This function is the same as the CPP method **OGRGeometryFactory::destroyGeometry** (p. 153).

**Parameters:**

*hGeom* handle to the geometry to delete.

References OGRGeometryFactory::destroyGeometry(), and OGR\_G\_DestroyGeometry().

Referenced by OGR\_G\_DestroyGeometry().

**17.9.2.87 void OGR\_G\_DumpReadable (OGRGeometryH *hGeom*, FILE \* *fp*, const char \* *pszPrefix*)**

Dump geometry in well known text format to indicated output file.

This method is the same as the CPP method **OGRGeometry::dumpReadable** (p. 129).

**Parameters:**

*hGeom* handle on the geometry to dump.

*fp* the text file to write the geometry to.

*pszPrefix* the prefix to put on each line of output.

References OGR\_G\_DumpReadable().

Referenced by OGR\_G\_DumpReadable().

---

**17.9.2.88 void OGR\_G\_Empty (OGRGeometryH *hGeom*)**

Clear geometry information. This restores the geometry to it's initial state after construction, and before assignment of actual geometry.

This function relates to the SFCOM IGeometry::Empty() method.

This function is the same as the CPP method **OGRGeometry::empty()** (p. 129).

**Parameters:**

*hGeom* handle on the geometry to empty.

References OGR\_G\_Empty().

Referenced by OGR\_G\_Empty().

**17.9.2.89 int OGR\_G\_Equals (OGRGeometryH *hGeom*, OGRGeometryH *hOther*)**

Returns two if two geometries are equivalent.

This function is the same as the CPP method **OGRGeometry::Equals()** (p. 129) method.

**Parameters:**

*hGeom* handle on the first geometry.

*hOther* handle on the other geometry to test against.

**Returns:**

TRUE if equivalent or FALSE otherwise.

References OGR\_G\_Equals().

Referenced by OGR\_G\_Equals().

**17.9.2.90 OGRErr OGR\_G\_ExportToWkb (OGRGeometryH *hGeom*, OGRwkbByteOrder *eOrder*, unsigned char \* *pabyDstBuffer*)**

Convert a geometry into well known binary format.

This function relates to the SFCOM IWks::ExportToWKB() method.

This function is the same as the CPP method **OGRGeometry::exportToWkb()** (p. 130).

**Parameters:**

*hGeom* handle on the geometry to convert to a well know binary data from.

*eOrder* One of wkbXDR or wkbNDR indicating MSB or LSB byte order respectively.

*pabyDstBuffer* a buffer into which the binary representation is written. This buffer must be at least **OGR\_G\_WkbSize()** (p. 366) byte in size.

**Returns:**

Currently OGRErr\_NONE is always returned.

References OGR\_G\_ExportToWkb().

Referenced by OGR\_G\_ExportToWkb().

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**17.9.2.91 OGRErr OGR\_G\_ExportToWkt (OGRGeometryH *hGeom*, char \*\**ppszSrcText*)**

Convert a geometry into well known text format.

This function relates to the SFCOM IWks::ExportToWKT() method.

This function is the same as the CPP method **OGRGeometry::exportToWkt()** (p. 130).

**Parameters:**

*hGeom* handle on the geometry to convert to a text format from.

*ppszSrcText* a text buffer is allocated by the program, and assigned to the passed pointer.

**Returns:**

Currently OGRErr\_NONE is always returned.

References OGR\_G\_ExportToWkt().

Referenced by OGR\_G\_ExportToWkt().

**17.9.2.92 void OGR\_G\_FlattenTo2D (OGRGeometryH *hGeom*)**

Convert geometry to strictly 2D. In a sense this converts all Z coordinates to 0.0.

This function is the same as the CPP method **OGRGeometry::flattenTo2D()** (p. 131).

**Parameters:**

*hGeom* handle on the geometry to convert.

References OGR\_G\_FlattenTo2D().

Referenced by OGR\_G\_FlattenTo2D().

**17.9.2.93 double OGR\_G\_GetArea (OGRGeometryH *hGeom*)**

Compute geometry area.

Computes the area for an **OGRLinearRing** (p. 167), **OGRPolygon** (p. 201) or **OGRMultiPolygon** (p. 189). Undefined for all other geometry types (returns zero).

This function utilizes the C++ `get_Area()` methods such as **OGRPolygon::get\_Area()** (p. 204).

**Parameters:**

*hGeom* the geometry to operate on.

**Returns:**

the area or 0.0 for unsupported geometry types.

References `wkbGeometryCollection`, `wkbLinearRing`, `wkbLineString`, `wkbMultiPolygon`, and `wkbPolygon`.

---

**17.9.2.94 int OGR\_G\_GetCoordinateDimension (OGRGeometryH *hGeom*)**

Get the dimension of the coordinates in this geometry.

This function corresponds to the SFCOM IGeometry::GetDimension() method.

This function is the same as the CPP method **OGRGeometry::getCoordinateDimension()** (p. 131).

**Parameters:**

*hGeom* handle on the geometry to get the dimension of the coordinates from.

**Returns:**

in practice this always returns 2 indicating that coordinates are specified within a two dimensional space.

References OGR\_G\_GetCoordinateDimension().

Referenced by OGR\_G\_GetCoordinateDimension().

**17.9.2.95 int OGR\_G\_GetDimension (OGRGeometryH *hGeom*)**

Get the dimension of this geometry.

This function corresponds to the SFCOM IGeometry::GetDimension() method. It indicates the dimension of the geometry, but does not indicate the dimension of the underlying space (as indicated by **OGR\_G\_GetCoordinateDimension()** (p. 359) function).

This function is the same as the CPP method **OGRGeometry::getDimension()** (p. 132).

**Parameters:**

*hGeom* handle on the geometry to get the dimension from.

**Returns:**

0 for points, 1 for lines and 2 for surfaces.

References OGR\_G\_GetDimension().

Referenced by OGR\_G\_GetDimension().

**17.9.2.96 void OGR\_G\_GetEnvelope (OGRGeometryH *hGeom*, OGREnvelope \* *psEnvelope*)**

Computes and returns the bounding envelope for this geometry in the passed *psEnvelope* structure.

This function is the same as the CPP method **OGRGeometry::getEnvelope()** (p. 132).

**Parameters:**

*hGeom* handle of the geometry to get envelope from.

*psEnvelope* the structure in which to place the results.

References OGR\_G\_GetEnvelope().

Referenced by OGR\_G\_GetEnvelope().

---

**17.9.2.97 int OGR\_G\_GetGeometryCount (OGRGeometryH *hGeom*)**

Fetch the number of elements in a geometry or number of geometries in container.

**Parameters:**

*hGeom* single geometry or geometry container from which to get the number of elements.

**Returns:**

the number of elements.

References wkbGeometryCollection, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, and wkbPolygon.

**17.9.2.98 const char\* OGR\_G\_GetGeometryName (OGRGeometryH *hGeom*)**

Fetch WKT name for geometry type.

There is no SFCOM analog to this function.

This function is the same as the CPP method **OGRGeometry::getGeometryName()** (p. 132).

**Parameters:**

*hGeom* handle on the geometry to get name from.

**Returns:**

name used for this geometry type in well known text format.

References OGR\_G\_GetGeometryName().

Referenced by OGR\_G\_GetGeometryName().

**17.9.2.99 OGRGeometryH OGR\_G\_GetGeometryRef (OGRGeometryH *hGeom*, int *iSubGeom*)**

Fetch geometry from a geometry container.

This function returns an handle to a geometry within the container. The returned geometry remains owned by the container, and should not be modified. The handle is only valid until the next change to the geometry container. Use **OGR\_G\_Clone()** (p. 354) to make a copy.

This function relates to the SFCOM IGeometryCollection::get\_Geometry() method.

This function is the same as the CPP method **OGRGeometryCollection::getGeometryRef()** (p. 146).

**Parameters:**

*hGeom* handle to the geometry container from which to get a geometry from.

*iSubGeom* the index of the geometry to fetch, between 0 and getNumGeometries() - 1.

**Returns:**

handle to the requested geometry.

References wkbGeometryCollection, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, and wkbPolygon.

---

**17.9.2.100 OGRwkbGeometryType OGR\_G\_GetGeometryType (OGRGeometryH *hGeom*)**

Fetch geometry type.

Note that the geometry type may include the 2.5D flag. To get a 2D flattened version of the geometry type apply the `wkbFlatten()` macro to the return result.

This function is the same as the CPP method `OGRGeometry::getGeometryType()` (p. 133).

**Parameters:**

*hGeom* handle on the geometry to get type from.

**Returns:**

the geometry type code.

References `OGR_G_GetGeometryType()`.

Referenced by `OGR_G_GetGeometryType()`.

**17.9.2.101 void OGR\_G\_GetPoint (OGRGeometryH *hGeom*, int *i*, double \**pdfX*, double \**pdfY*, double \**pdfZ*)**

Fetch a point in line string or a point geometry.

**Parameters:**

*hGeom* handle to the geometry from which to get the coordinates.

*i* the vertex to fetch, from 0 to `getNumPoints()-1`, zero for a point.

*pdfX* value of x coordinate.

*pdfY* value of y coordinate.

*pdfZ* value of z coordinate.

References `wkbLineString`, and `wkbPoint`.

**17.9.2.102 int OGR\_G\_GetPointCount (OGRGeometryH *hGeom*)**

Fetch number of points from a geometry.

**Parameters:**

*hGeom* handle to the geometry from which to get the number of points.

**Returns:**

the number of points.

References `OGRLineString::getNumPoints()`, `wkbLineString`, and `wkbPoint`.

---

**17.9.2.103 OGRSpatialReferenceH OGR\_G\_GetSpatialReference (OGRGeometryH *hGeom*)**

Returns spatial reference system for geometry.

This function relates to the SFCOM IGeometry::get\_SpatialReference() method.

This function is the same as the CPP method **OGRGeometry::getSpatialReference()** (p. 133).

**Parameters:**

*hGeom* handle on the geometry to get spatial reference from.

**Returns:**

a reference to the spatial reference geometry.

References OGR\_G\_GetSpatialReference().

Referenced by OGR\_G\_GetSpatialReference().

**17.9.2.104 double OGR\_G\_GetX (OGRGeometryH *hGeom*, int *i*)**

Fetch the x coordinate of a point from a geometry.

**Parameters:**

*hGeom* handle to the geometry from which to get the x coordinate.

*i* point to get the x coordinate.

**Returns:**

the X coordinate of this point.

References wkbLineString, and wkbPoint.

**17.9.2.105 double OGR\_G\_GetY (OGRGeometryH *hGeom*, int *i*)**

Fetch the x coordinate of a point from a geometry.

**Parameters:**

*hGeom* handle to the geometry from which to get the y coordinate.

*i* point to get the Y coordinate.

**Returns:**

the Y coordinate of this point.

References wkbLineString, and wkbPoint.

**17.9.2.106 double OGR\_G\_GetZ (OGRGeometryH *hGeom*, int *i*)**

Fetch the z coordinate of a point from a geometry.

---

**Parameters:**

*hGeom* handle to the geometry from which to get the Z coordinate.

*i* point to get the Z coordinate.

**Returns:**

the Z coordinate of this point.

References wkbLineString, and wkbPoint.

### 17.9.2.107 OGRErr OGR\_G\_ImportFromWkb (OGRGeometryH *hGeom*, unsigned char \* *pabyData*, int *nSize*)

Assign geometry from well known binary data.

The object must have already been instantiated as the correct derived type of geometry object to match the binaries type.

This function relates to the SFCOM IWks::ImportFromWKB() method.

This function is the same as the CPP method **OGRGeometry::importFromWkb()** (p. 133).

**Parameters:**

*hGeom* handle on the geometry to assign the well know binary data to.

*pabyData* the binary input data.

*nSize* the size of pabyData in bytes, or zero if not known.

**Returns:**

OGRErr\_NONE if all goes well, otherwise any of OGRErr\_NOT\_ENOUGH\_DATA, OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRErr\_CORRUPT\_DATA may be returned.

References OGR\_G\_ImportFromWkb().

Referenced by OGR\_G\_ImportFromWkb().

### 17.9.2.108 OGRErr OGR\_G\_ImportFromWkt (OGRGeometryH *hGeom*, char \*\* *ppszSrcText*)

Assign geometry from well known text data.

The object must have already been instantiated as the correct derived type of geometry object to match the text type.

This function relates to the SFCOM IWks::ImportFromWKT() method.

This function is the same as the CPP method **OGRGeometry::importFromWkt()** (p. 134).

**Parameters:**

*hGeom* handle on the geometry to assign well know text data to.

*ppszSrcText* pointer to a pointer to the source text. The pointer is updated to pointer after the consumed text.

**Returns:**

OGRErr\_NONE if all goes well, otherwise any of OGRErr\_NOT\_ENOUGH\_DATA, OGRErr\_UNSUPPORTED\_GEOMETRY\_TYPE, or OGRErr\_CORRUPT\_DATA may be returned.

References OGR\_G\_ImportFromWkt().

Referenced by OGR\_G\_ImportFromWkt().

#### 17.9.2.109 int OGR\_G\_Intersects (OGRGeometryH *hGeom*, OGRGeometryH *hOtherGeom*)

Do these features intersect?

Currently this is not implemented in a rigorous fashion, and generally just tests whether the envelopes of the two features intersect. Eventually this will be made rigorous.

This function is the same as the CPP method **OGRGeometry::Intersects** (p. 135).

##### Parameters:

*hGeom* handle on the first geometry.

*hOtherGeom* handle on the other geometry to test against.

##### Returns:

TRUE if the geometries intersect, otherwise FALSE.

References OGR\_G\_Intersects().

Referenced by OGR\_G\_Intersects().

#### 17.9.2.110 OGRErr OGR\_G\_RemoveGeometry (OGRGeometryH *hGeom*, int *iGeom*, int *bDelete*)

Remove a geometry from an existing geometry container.

Removing a geometry will cause the geometry count to drop by one, and all "higher" geometries will shuffle down one in index.

There is no SFCOM analog to this method.

This function is the same as the CPP method **OGRGeometryCollection::removeGeometry()** (p. 148).

##### Parameters:

*hGeom* the existing geometry to delete from.

*iGeom* the index of the geometry to delete. A value of -1 is a special flag meaning that all geometries should be removed.

*bDelete* if TRUE the geometry will be destroyed, otherwise it will not. The default is TRUE as the existing geometry is considered to own the geometries in it.

##### Returns:

OGRERR\_NONE if successful, or OGRERR\_FAILURE if the index is out of range.

References wkbGeometryCollection, wkbMultiLineString, wkbMultiPoint, wkbMultiPolygon, and wkbPolygon.

---

**17.9.2.111 void OGR\_G\_SetPoint (OGRGeometryH *hGeom*, int *i*, double *dfX*, double *dfY*, double *dfZ*)**

Set the location of a vertex in a point or linestring geometry.

If *i*Point is larger than the number of existing points in the linestring, the point count will be increased to accomodate the request.

**Parameters:**

*hGeom* handle to the geometry to add a vertex to.

*i* the index of the vertex to assign (zero based) or zero for a point.

*dfX* input X coordinate to assign.

*dfY* input Y coordinate to assign.

*dfZ* input Z coordinate to assign (defaults to zero).

References `wkbLineString`, and `wkbPoint`.

**17.9.2.112 void OGR\_G\_SetPoint\_2D (OGRGeometryH *hGeom*, int *i*, double *dfX*, double *dfY*)**

Set the location of a vertex in a point or linestring geometry.

If *i*Point is larger than the number of existing points in the linestring, the point count will be increased to accomodate the request.

**Parameters:**

*hGeom* handle to the geometry to add a vertex to.

*i* the index of the vertex to assign (zero based) or zero for a point.

*dfX* input X coordinate to assign.

*dfY* input Y coordinate to assign.

References `wkbLineString`, and `wkbPoint`.

**17.9.2.113 OGRErr OGR\_G\_Transform (OGRGeometryH *hGeom*, OGRCoordinateTransformationH *hTransform*)**

Apply arbitrary coordinate transformation to geometry.

This function will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

Note that this function does not require that the geometry already have a spatial reference system. It will be assumed that they can be treated as having the source spatial reference system of the **OGRCoordinateTransformation** (p. 86) object, and the actual SRS of the geometry will be ignored. On successful completion the output **OGRSpatialReference** (p. 217) of the **OGRCoordinateTransformation** (p. 86) will be assigned to the geometry.

This function is the same as the CPP method **OGRGeometry::transform** (p. 138).

**Parameters:**

*hGeom* handle on the geometry to apply the transform to.

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*hTransform* handle on the transformation to apply.

**Returns:**

OGRERR\_NONE on success or an error code.

References OGR\_G\_Transform().

Referenced by OGR\_G\_Transform().

### 17.9.2.114 OGRErr OGR\_G\_TransformTo (OGRGeometryH *hGeom*, OGRSpatialReferenceH *hSRS*)

Transform geometry to new spatial reference system.

This function will transform the coordinates of a geometry from their current spatial reference system to a new target spatial reference system. Normally this means reprojecting the vectors, but it could include datum shifts, and changes of units.

This function will only work if the geometry already has an assigned spatial reference system, and if it is transformable to the target coordinate system.

Because this function requires internal creation and initialization of an **OGRCoordinateTransformation** (p. 86) object it is significantly more expensive to use this function to transform many geometries than it is to create the **OGRCoordinateTransformation** (p. 86) in advance, and call transform() with that transformation. This function exists primarily for convenience when only transforming a single geometry.

This function is the same as the CPP method **OGRGeometry::transformTo** (p. 139).

**Parameters:**

*hGeom* handle on the geometry to apply the transform to.

*hSRS* handle on the spatial reference system to apply.

**Returns:**

OGRERR\_NONE on success, or an error code.

References OGR\_G\_TransformTo().

Referenced by OGR\_G\_TransformTo().

### 17.9.2.115 int OGR\_G\_WkbSize (OGRGeometryH *hGeom*)

Returns size of related binary representation.

This function returns the exact number of bytes required to hold the well known binary representation of this geometry object. Its computation may be slightly expensive for complex geometries.

This function relates to the SFCOM IWks::WkbSize() method.

This function is the same as the CPP method **OGRGeometry::WkbSize()** (p. 140).

**Parameters:**

*hGeom* handle on the geometry to get the binary size from.

**Returns:**

size of binary representation in bytes.

References OGR\_G\_WkbSize().

Referenced by OGR\_G\_WkbSize().

**17.9.2.116 const char\* OGR\_GetFieldName (OGRFieldType *eType*)**

Fetch human readable name for a field type.

This function is the same as the CPP method **OGRFieldDefn::GetFieldName()** (p. 120).

**Parameters:**

*eType* the field type to get name for.

**Returns:**

the name.

References OGRFieldDefn::GetFieldName(), and OGR\_GetFieldName().

Referenced by OGR\_GetFieldName().

**17.9.2.117 OGRErr OGR\_L\_CommitTransaction (OGRLayerH *hLayer*)**

For datasources which support transactions, CommitTransaction commits a transaction. If no transaction is active, or the commit fails, will return OGRErr\_FAILURE. Datasources which do not support transactions will always return OGRErr\_NONE.

This function is the same as the C++ method **OGRLayer::CommitTransaction()**.

**Parameters:**

*hLayer* handle to the layer

**Returns:**

OGRErr\_NONE on success.

References OGR\_L\_CommitTransaction().

Referenced by OGR\_L\_CommitTransaction().

**17.9.2.118 OGRErr OGR\_L\_CreateFeature (OGRLayerH *hLayer*, OGRFeatureH *hFeat*)**

Create and write a new feature within a layer.

The passed feature is written to the layer as a new feature, rather than overwriting an existing one. If the feature has a feature id other than OGRNullFID, then the native implementation may use that as the feature id of the new feature, but not necessarily. Upon successful return the passed feature will have been updated with the new feature id.

This function is the same as the C++ method **OGRLayer::CreateFeature()** (p. 156).

---

**Parameters:**

*hLayer* handle to the layer to write the feature to.

*hFeat* the handle of the feature to write to disk.

**Returns:**

OGRERR\_NONE on success.

References OGR\_L\_CreateFeature().

Referenced by OGR\_L\_CreateFeature().

**17.9.2.119 OGRERR OGR\_L\_CreateField (OGRLayerH hLayer, OGRFieldDefnH hField, int bApproxOK)**

Create a new field on a layer. You must use this to create new fields on a real layer. Internally the **OGRFeatureDefn** (p. 113) for the layer will be updated to reflect the new field. Applications should never modify the **OGRFeatureDefn** (p. 113) used by a layer directly.

This function is the same as the C++ method **OGRLayer::CreateField()** (p. 157).

**Parameters:**

*hLayer* handle to the layer to write the field definition.

*hField* handle of the field definition to write to disk.

*bApproxOK* If TRUE, the field may be created in a slightly different form depending on the limitations of the format driver.

**Returns:**

OGRERR\_NONE on success.

References OGR\_L\_CreateField().

Referenced by OGR\_L\_CreateField().

**17.9.2.120 OGRERR OGR\_L\_DeleteFeature (OGRLayerH hLayer, long nFID)**

Delete feature from layer.

The feature with the indicated feature id is deleted from the layer if supported by the driver. Most drivers do not support feature deletion, and will return OGRERR\_UNSUPPORTED\_OPERATION. The **OGR\_L\_TestCapability()** (p. 374) function may be called with OLCDeleteFeature to check if the driver supports feature deletion.

This method is the same as the C++ method **OGRLayer::DeleteFeature()** (p. 157).

**Parameters:**

*poFeature* the feature to write to disk.

**Returns:**

OGRERR\_NONE on success.

References OGR\_L\_DeleteFeature().

Referenced by OGR\_L\_DeleteFeature().

---

**17.9.2.121 OGRErr OGR\_L\_GetExtent (OGRLayerH *hLayer*, OGREnvelope \* *psExtent*, int *bForce*)**

Fetch the extent of this layer.

Returns the extent (MBR) of the data in the layer. If *bForce* is FALSE, and it would be expensive to establish the extent then OGRERR\_FAILURE will be returned indicating that the extent isn't know. If *bForce* is TRUE then some implementations will actually scan the entire layer once to compute the MBR of all the features in the layer.

The returned extent does not take the spatial filter into account. If a spatial filter was previously set then it should be ignored but some implementations may be unable to do that, so it is safer to call **OGR\_L\_GetExtent()** (p. 369) without setting a spatial filter.

Layers without any geometry may return OGRERR\_FAILURE just indicating that no meaningful extents could be collected.

This function is the same as the C++ method **OGRLayer::GetExtent()** (p. 158).

**Parameters:**

*hLayer* handle to the layer from which to get extent.

*psExtent* the structure in which the extent value will be returned.

*bForce* Flag indicating whether the extent should be computed even if it is expensive.

**Returns:**

OGRERR\_NONE on success, OGRERR\_FAILURE if extent not known.

References OGR\_L\_GetExtent().

Referenced by OGR\_L\_GetExtent().

**17.9.2.122 OGRFeatureH OGR\_L\_GetFeature (OGRLayerH *hLayer*, long *nFeatureId*)**

Fetch a feature by it's identifier.

This function will attempt to read the identified feature. The *nFID* value cannot be OGRNullFID. Success or failure of this operation is unaffected by the spatial or attribute filters.

If this function returns a non-NULL feature, it is guaranteed that it's feature id (**OGR\_F\_GetFID()** (p. 333)) will be the same as *nFID*.

Use **OGR\_L\_TestCapability(OLCRandomRead)** to establish if this layer supports efficient random access reading via **OGR\_L\_GetFeature()** (p. 369); however, the call should always work if the feature exists as a fallback implementation just scans all the features in the layer looking for the desired feature.

Sequential reads are generally considered interrupted by a **OGR\_L\_GetFeature()** (p. 369) call.

This function is the same as the C++ method **OGRLayer::GetFeature()** (p. 159).

**Parameters:**

*hLayer* handle to the layer that owned the feature.

*nFeatureId* the feature id of the feature to read.

**Returns:**

an handle to a feature now owned by the caller, or NULL on failure.

References `OGR_L_GetFeature()`.

Referenced by `OGR_L_GetFeature()`.

#### 17.9.2.123 `OGRFeatureDefnH OGR_L_GetLayerDefn (OGRLayerH hLayer)`

Fetch the schema information for this layer.

The returned handle to the **`OGRFeatureDefn`** (p. 113) is owned by the **`OGRLayer`** (p. 156), and should not be modified or freed by the application. It encapsulates the attribute schema of the features of the layer.

This function is the same as the C++ method **`OGRLayer::GetLayerDefn()`** (p. 160).

##### Parameters:

*hLayer* handle to the layer to get the schema information.

##### Returns:

an handle to the feature definition.

References `OGR_L_GetLayerDefn()`.

Referenced by `OGR_L_GetLayerDefn()`.

#### 17.9.2.124 `OGRFeatureH OGR_L_GetNextFeature (OGRLayerH hLayer)`

Fetch the next available feature from this layer. The returned feature becomes the responsibility of the caller to delete. It is critical that all features associated with an **`OGRLayer`** (p. 156) (more specifically an **`OGRFeatureDefn`** (p. 113)) be deleted before that layer/datasource is deleted.

Only features matching the current spatial filter (set with `SetSpatialFilter()`) will be returned.

This function implements sequential access to the features of a layer. The **`OGR_L_ResetReading()`** (p. 371) function can be used to start at the beginning again. Random reading, writing and spatial filtering will be added to the **`OGRLayer`** (p. 156) in the future.

This function is the same as the C++ method **`OGRLayer::GetNextFeature()`** (p. 161).

##### Parameters:

*hLayer* handle to the layer from which feature are read.

##### Returns:

an handle to a feature, or NULL if no more features are available.

References `OGR_L_GetNextFeature()`.

Referenced by `OGR_L_GetNextFeature()`.

#### 17.9.2.125 `OGRGeometryH OGR_L_GetSpatialFilter (OGRLayerH hLayer)`

This function returns the current spatial filter for this layer.

The returned pointer is to an internally owned object, and should not be altered or deleted by the caller.

This function is the same as the C++ method **`OGRLayer::GetSpatialFilter()`** (p. 161).

---

**Parameters:**

*hLayer* handle to the layer to get the spatial filter from.

**Returns:**

an handle to the spatial filter geometry.

References OGR\_L\_GetSpatialFilter().

Referenced by OGR\_L\_GetSpatialFilter().

**17.9.2.126 OGRSpatialReferenceH OGR\_L\_GetSpatialRef (OGRLayerH hLayer)**

Fetch the spatial reference system for this layer.

The returned object is owned by the **OGRLayer** (p. 156) and should not be modified or freed by the application.

This function is the same as the C++ method **OGRLayer::GetSpatialRef()** (p. 161).

**Parameters:**

*hLayer* handle to the layer to get the spatial reference from.

**Returns:**

spatial reference, or NULL if there isn't one.

References OGR\_L\_GetSpatialRef().

Referenced by OGR\_L\_GetSpatialRef().

**17.9.2.127 void OGR\_L\_ResetReading (OGRLayerH hLayer)**

Reset feature reading to start on the first feature. This affects GetNextFeature().

This function is the same as the C++ method **OGRLayer::ResetReading()** (p. 162).

**Parameters:**

*hLayer* handle to the layer on which features are read.

References OGR\_L\_ResetReading().

Referenced by OGR\_L\_ResetReading().

**17.9.2.128 OGRErr OGR\_L\_RollbackTransaction (OGRLayerH hLayer)**

For datasources which support transactions, RollbackTransaction will roll back a datasource to its state before the start of the current transaction. If no transaction is active, or the rollback fails, will return OGRERR\_FAILURE. Datasources which do not support transactions will always return OGRERR\_NONE.

This function is the same as the C++ method **OGRLayer::RollbackTransaction()**.

---

**Parameters:**

*hLayer* handle to the layer

**Returns:**

OGRERR\_NONE on success.

References OGR\_L\_RollbackTransaction().

Referenced by OGR\_L\_RollbackTransaction().

**17.9.2.129 OGRErr OGR\_L\_SetAttributeFilter (OGRLayerH *hLayer*, const char \* *pszQuery*)**

Set a new attribute query.

This function sets the attribute query string to be used when fetching features via the **OGR\_L\_GetNextFeature()** (p. 370) function. Only features for which the query evaluates as true will be returned.

The query string should be in the format of an SQL WHERE clause. For instance "population > 1000000 and population < 5000000" where population is an attribute in the layer. The query format is a restricted form of SQL WHERE clause as defined "eq\_format=restricted\_where" about half way through this document:

<http://ogdi.sourceforge.net/prop/6.2.CapabilitiesMetadata.html>

Note that installing a query string will generally result in resetting the current reading position (ala **OGR\_L\_ResetReading()** (p. 371)).

This function is the same as the C++ method **OGRLayer::SetAttributeFilter()** (p. 162).

**Parameters:**

*hLayer* handle to the layer on which attribute query will be executed.

*pszQuery* query in restricted SQL WHERE format, or NULL to clear the current query.

**Returns:**

OGRERR\_NONE if successfully installed, or an error code if the query expression is in error, or some other failure occurs.

References OGR\_L\_SetAttributeFilter().

Referenced by OGR\_L\_SetAttributeFilter().

**17.9.2.130 OGRErr OGR\_L\_SetFeature (OGRLayerH *hLayer*, OGRFeatureH *hFeat*)**

Rewrite an existing feature.

This function will write a feature to the layer, based on the feature id within the **OGRFeature** (p. 99).

Use OGR\_L\_TestCapability(OLCRandomWrite) to establish if this layer supports random access writing via **OGR\_L\_SetFeature()** (p. 372).

This function is the same as the C++ method **OGRLayer::SetFeature()** (p. 163).

**Parameters:**

*hLayer* handle to the layer to write the feature.

---

*hFeat* the feature to write.

**Returns:**

OGRERR\_NONE if the operation works, otherwise an appropriate error code.

References OGR\_L\_SetFeature().

Referenced by OGR\_L\_SetFeature().

### 17.9.2.131 void OGR\_L\_SetSpatialFilter (OGRLayerH *hLayer*, OGRGeometryH *hGeom*)

Set a new spatial filter.

This function set the geometry to be used as a spatial filter when fetching features via the **OGR\_L\_GetNextFeature()** (p. 370) function. Only features that geometrically intersect the filter geometry will be returned.

Currently this test is may be inaccurately implemented, but it is guaranteed that all features who's envelope (as returned by **OGR\_G\_GetEnvelope()** (p. 359)) overlaps the envelope of the spatial filter will be returned. This can result in more shapes being returned that should strictly be the case.

This function makes an internal copy of the passed geometry. The passed geometry remains the responsibility of the caller, and may be safely destroyed.

For the time being the passed filter geometry should be in the same SRS as the layer (as returned by **OGR\_L\_GetSpatialRef()** (p. 371)). In the future this may be generalized.

This function is the same as the C++ method **OGRLayer::SetSpatialFilter** (p. 163).

**Parameters:**

*hLayer* handle to the layer on which to set the spatial filter.

*hGeom* handle to the geometry to use as a filtering region. NULL may be passed indicating that the current spatial filter should be cleared, but no new one instituted.

References OGR\_L\_SetSpatialFilter().

Referenced by OGR\_L\_SetSpatialFilter().

### 17.9.2.132 OGRErr OGR\_L\_StartTransaction (OGRLayerH *hLayer*)

For datasources which support transactions, StartTransaction creates a transaction. If starting the transaction fails, will return OGRERR\_FAILURE. Datasources which do not support transactions will always return OGRERR\_NONE.

This function is the same as the C++ method **OGRLayer::StartTransaction()**.

**Parameters:**

*hLayer* handle to the layer

**Returns:**

OGRERR\_NONE on success.

References OGR\_L\_StartTransaction().

Referenced by OGR\_L\_StartTransaction().

### 17.9.2.133 `int OGR_L_TestCapability (OGRLayerH hLayer, const char * pszCap)`

Test if this layer supported the named capability.

The capability codes that can be tested are represented as strings, but defined constants exists to ensure correct spelling. Specific layer types may implement class specific capabilities, but this can't generally be discovered by the caller.

- **OLCRandomRead** / "RandomRead": TRUE if the **OGR\_L\_GetFeature()** (p. 369) function works for this layer.
- **OLCSequentialWrite** / "SequentialWrite": TRUE if the **OGR\_L\_CreateFeature()** (p. 367) function works for this layer. Note this means that this particular layer is writable. The same **OGRLayer** (p. 156) class may returned FALSE for other layer instances that are effectively read-only.
- **OLCRandomWrite** / "RandomWrite": TRUE if the **OGR\_L\_SetFeature()** (p. 372) function is operational on this layer. Note this means that this particular layer is writable. The same **OGRLayer** (p. 156) class may returned FALSE for other layer instances that are effectively read-only.
- **OLCFastSpatialFilter** / "FastSpatialFilter": TRUE if this layer implements spatial filtering efficiently. Layers that effectively read all features, and test them with the **OGRFeature** (p. 99) intersection methods should return FALSE. This can be used as a clue by the application whether it should build and maintain it's own spatial index for features in this layer.
- **OLCFastFeatureCount** / "FastFeatureCount": TRUE if this layer can return a feature count (via **OGR\_L\_GetFeatureCount()**) efficiently ... ie. without counting the features. In some cases this will return TRUE until a spatial filter is installed after which it will return FALSE.
- **OLCFastGetExtent** / "FastGetExtent": TRUE if this layer can return its data extent (via **OGR\_L\_GetExtent()** (p. 369)) efficiently ... ie. without scanning all the features. In some cases this will return TRUE until a spatial filter is installed after which it will return FALSE.

This function is the same as the C++ method **OGRLayer::TestCapability()** (p. 165).

#### Parameters:

***hLayer*** handle to the layer to get the capability from.

***pszCap*** the name of the capability to test.

#### Returns:

TRUE if the layer has the requested capability, or FALSE otherwise. OGRLayers will return FALSE for any unrecognised capabilities.

References **OGR\_L\_TestCapability()**.

Referenced by **OGR\_L\_TestCapability()**.

### 17.9.2.134 `int OGR_SM_AddPart (OGRStyleMgrH hSM, OGRStyleToolH hST)`

Add a part (style tool) to the current style.

This function is the same as the C++ method **OGRStyleMgr::AddPart()**.

#### Parameters:

***hSM*** handle to the style manager.

*hST* the style tool defining the part to add.

**Returns:**

TRUE on success, FALSE on errors.

References OGR\_SM\_AddPart().

Referenced by OGR\_SM\_AddPart().

**17.9.2.135 OGRStyleMgrH OGR\_SM\_Create (void \* *hStyleTable*)**

OGRStyleMgr factory.

This function is the same as the C++ method OGRStyleMgr::OGRStyleMgr().

**Parameters:**

*hStyleTable* (currently unused, reserved for future use), pointer to OGRStyleTable. Pass NULL for now.

**Returns:**

an handle to the new style manager object.

References OGR\_SM\_Create().

Referenced by OGR\_SM\_Create().

**17.9.2.136 void OGR\_SM\_Destroy (OGRStyleMgrH *hSM*)**

Destroy Style Manager

**Parameters:**

*hSM* handle to the style manager to destroy.

References OGR\_SM\_Destroy().

Referenced by OGR\_SM\_Destroy().

**17.9.2.137 OGRStyleToolH OGR\_SM\_GetPart (OGRStyleMgrH *hSM*, int *nPartId*, const char \* *pszStyleString*)**

Fetch a part (style tool) from the current style.

This function is the same as the C++ method OGRStyleMgr::GetPart().

**Parameters:**

*hSM* handle to the style manager.

*nPartId* the part number (0-based index)

*pszStyleString* (optional) the style string on which to operate. If NULL then the current style string stored in the style manager is used.

---

**Returns:**

OGRStyleToolH of the requested part (style tools) or NULL on error.

References OGR\_SM\_GetPart().

Referenced by OGR\_SM\_GetPart().

**17.9.2.138 int OGR\_SM\_GetPartCount (OGRStyleMgrH *hSM*, const char \* *pszStyleString*)**

Add a part (style tool) to the current style.

This function is the same as the C++ method OGRStyleMgr::GetPartCount().

**Parameters:**

*hSM* handle to the style manager.

*pszStyleString* (optional) the style string on which to operate. If NULL then the current style string stored in the style manager is used.

**Returns:**

the number of parts (style tools) in the style.

References OGR\_SM\_GetPartCount().

Referenced by OGR\_SM\_GetPartCount().

**17.9.2.139 const char\* OGR\_SM\_InitFromFeature (OGRStyleMgrH *hSM*, OGRFeatureH *hFeat*)**

Initialize style manager from the style string of a feature.

This function is the same as the C++ method OGRStyleMgr::InitFromFeature().

**Parameters:**

*hSM* handle to the style manager.

*hFeature* handle to the new feature from which to read the style.

**Returns:**

a reference to the style string read from the feature, or NULL in case of error..

References OGR\_SM\_InitFromFeature().

Referenced by OGR\_SM\_InitFromFeature().

**17.9.2.140 int OGR\_SM\_InitStyleString (OGRStyleMgrH *hSM*, const char \* *pszStyleString*)**

Initialize style manager from the style string.

This function is the same as the C++ method OGRStyleMgr::InitStyleString().

**Parameters:**

*hSM* handle to the style manager.

---

*pszStyleString* the style string to use (can be NULL).

**Returns:**

TRUE on success, FALSE on errors.

References OGR\_SM\_InitStyleString().

Referenced by OGR\_SM\_InitStyleString().

### 17.9.2.141 OGRStyleToolH OGR\_ST\_Create (OGRSTClassId *eClassId*)

OGRStyleTool factory.

This function is a constructor for OGRStyleTool derived classes.

**Parameters:**

*eClassId* subclass of style tool to create. One of OGRSTCPen (1), OGRSTCBrush (2), OGRSTC-Symbol (3) or OGRSTCLabel (4).

**Returns:**

an handle to the new style tool object or NULL if the creation failed.

References OGR\_ST\_Create().

Referenced by OGR\_ST\_Create().

### 17.9.2.142 void OGR\_ST\_Destroy (OGRStyleToolH *hST*)

Destroy Style Tool

**Parameters:**

*hST* handle to the style tool to destroy.

References OGR\_ST\_Destroy().

Referenced by OGR\_ST\_Destroy().

### 17.9.2.143 double OGR\_ST\_GetParamDbl (OGRStyleToolH *hST*, int *eParam*, int \* *bValueIsNull*)

Get Style Tool parameter value as a double

Maps to the OGRStyleTool subclasses' GetParamDbl() methods.

**Parameters:**

*hST* handle to the style tool.

*eParam* the parameter id from the enumeration corresponding to the type of this style tool (one of the OGRSTPenParam, OGRSTBrushParam, OGRSTSymbolParam or OGRSTLabelParam enumerations)

*bValueIsNull* pointer to an integer that will be set to TRUE or FALSE to indicate whether the parameter value is NULL.

**Returns:**

the parameter value as double and sets bValueIsNull.

References OGR\_ST\_GetParamDbl().

Referenced by OGR\_ST\_GetParamDbl().

**17.9.2.144 int OGR\_ST\_GetParamNum (OGRStyleToolH *hST*, int *eParam*, int \* *bValueIsNull*)**

Get Style Tool parameter value as an integer

Maps to the OGRStyleTool subclasses' GetParamNum() methods.

**Parameters:**

***hST*** handle to the style tool.

***eParam*** the parameter id from the enumeration corresponding to the type of this style tool (one of the OGRSTPenParam, OGRSTBrushParam, OGRSTSymbolParam or OGRSTLabelParam enumerations)

***bValueIsNull*** pointer to an integer that will be set to TRUE or FALSE to indicate whether the parameter value is NULL.

**Returns:**

the parameter value as integer and sets bValueIsNull.

References OGR\_ST\_GetParamNum().

Referenced by OGR\_ST\_GetParamNum().

**17.9.2.145 const char\* OGR\_ST\_GetParamStr (OGRStyleToolH *hST*, int *eParam*, int \* *bValueIsNull*)**

Get Style Tool parameter value as string

Maps to the OGRStyleTool subclasses' GetParamStr() methods.

**Parameters:**

***hST*** handle to the style tool.

***eParam*** the parameter id from the enumeration corresponding to the type of this style tool (one of the OGRSTPenParam, OGRSTBrushParam, OGRSTSymbolParam or OGRSTLabelParam enumerations)

***bValueIsNull*** pointer to an integer that will be set to TRUE or FALSE to indicate whether the parameter value is NULL.

**Returns:**

the parameter value as string and sets bValueIsNull.

References OGR\_ST\_GetParamStr().

Referenced by OGR\_ST\_GetParamStr().

---

**17.9.2.146 int OGR\_ST\_GetRGBFromString (OGRStyleToolH *hST*, const char \* *pszColor*, int \* *pnRed*, int \* *pnGreen*, int \* *pnBlue*, int \* *pnAlpha*)**

Return the r,g,b,a components of a color encoded in RRGGBB[AA] format

Maps to OGRStyleTool::GetRGBFromString().

**Parameters:**

*hST* handle to the style tool.

*pszColor* the color to parse

*pnRed* pointer to an int in which the red value will be returned

*pnGreen* pointer to an int in which the green value will be returned

*pnBlue* pointer to an int in which the blue value will be returned

*pnAlpha* pointer to an int in which the (optional) alpha value will be returned

**Returns:**

TRUE if the color could be successfully parsed, or FALSE in case of errors.

References OGR\_ST\_GetRGBFromString().

Referenced by OGR\_ST\_GetRGBFromString().

**17.9.2.147 const char\* OGR\_ST\_GetStyleString (OGRStyleToolH *hST*)**

Get the style string for this Style Tool

Maps to the OGRStyleTool subclasses' GetStyleString() methods.

**Parameters:**

*hST* handle to the style tool.

**Returns:**

the style string for this style tool or "" if the *hST* is invalid.

References OGR\_ST\_GetStyleString().

Referenced by OGR\_ST\_GetStyleString().

**17.9.2.148 OGRSTCClassId OGR\_ST\_GetType (OGRStyleToolH *hST*)**

Determine type of Style Tool

**Parameters:**

*hST* handle to the style tool.

**Returns:**

the style tool type, one of OGRSTCPen (1), OGRSTCBrush (2), OGRSTCSymbol (3) or OGRSTCLabel (4). Returns OGRSTCNone (0) if the OGRStyleToolH is invalid.

References OGR\_ST\_GetType().

Referenced by OGR\_ST\_GetType().

---

**17.9.2.149 OGRSTUnitId OGR\_ST\_GetUnit (OGRStyleToolH *hST*)**

Get Style Tool units

**Parameters:**

*hST* handle to the style tool.

**Returns:**

the style tool units.

References OGR\_ST\_GetUnit().

Referenced by OGR\_ST\_GetUnit().

**17.9.2.150 void OGR\_ST\_SetParamNum (OGRStyleToolH *hST*, int *eParam*, int *nValue*)**

Set Style Tool parameter value from an integer

Maps to the OGRStyleTool subclasses' SetParamNum() methods.

**Parameters:**

*hST* handle to the style tool.

*eParam* the parameter id from the enumeration corresponding to the type of this style tool (one of the OGRSTPenParam, OGRSTBrushParam, OGRSTSymbolParam or OGRSTLabelParam enumerations)

*nValue* the new parameter value

References OGR\_ST\_SetParamNum().

Referenced by OGR\_ST\_SetParamNum().

**17.9.2.151 void OGR\_ST\_SetParamStr (OGRStyleToolH *hST*, int *eParam*, const char \* *pszValue*)**

Set Style Tool parameter value from a string

Maps to the OGRStyleTool subclasses' SetParamStr() methods.

**Parameters:**

*hST* handle to the style tool.

*eParam* the parameter id from the enumeration corresponding to the type of this style tool (one of the OGRSTPenParam, OGRSTBrushParam, OGRSTSymbolParam or OGRSTLabelParam enumerations)

*pszValue* the new parameter value

References OGR\_ST\_SetParamStr().

Referenced by OGR\_ST\_SetParamStr().

---

### 17.9.2.152 void OGR\_ST\_SetUnit (OGRStyleToolH *hST*, OGRSTUnitId *eUnit*, double *dfGroundPaperScale*)

Set Style Tool units

This function is the same as OGRStyleTool::SetUnit()

#### Parameters:

*hST* handle to the style tool.

*eUnit* the new unit.

*dfGroundPaperScale* ground to paper scale factor.

References OGR\_ST\_SetUnit().

Referenced by OGR\_ST\_SetUnit().

### 17.9.2.153 OGRGeometryH OGRBuildPolygonFromEdges (OGRGeometryH *hLines*, int *bBestEffort*, int *bAutoClose*, double *dfTolerance*, OGRErr \**peErr*)

Build a ring from a bunch of arcs.

#### Parameters:

*hLines* handle to an **OGRGeometryCollection** (p. 141) (or **OGRMultiLineString** (p. 183)) containing the line string geometries to be built into rings.

*bBestEffort* not yet implemented???

*bAutoClose* indicates if the ring should be close when first and last points of the ring are the same.

*dfTolerance* tolerance into which two arcs are considered close enough to be joined.

*peErr* OGRErr\_NONE on success, or OGRErr\_FAILURE on failure.

#### Returns:

an handle to the new geometry, a polygon.

References OGRLineString::addPoint(), OGRPolygon::addRingDirectly(), OGRGeometryCollection::getGeometryRef(), OGRGeometryCollection::getNumGeometries(), OGRPolygon::getNumInteriorRings(), OGRLineString::getNumPoints(), OGRLineString::getX(), OGRLineString::getY(), OGRLineString::getZ(), and OGRBuildPolygonFromEdges().

Referenced by OGRBuildPolygonFromEdges().

### 17.9.2.154 OGRSFDriverH OGRGetDriver (int *iDriver*)

Fetch the indicated driver.

This function is the same as the C++ method **OGRSFDriverRegistrar::GetDriver()** (p. 214).

#### Parameters:

*iDriver* the driver index, from 0 to GetDriverCount()-1.

#### Returns:

handle to the driver, or NULL if *iDriver* is out of range.

References OGRSFDriverRegistrar::GetDriver(), and OGRGetDriver().

Referenced by OGRGetDriver().

### 17.9.2.155 int OGRGetDriverCount (void)

Fetch the number of registered drivers.

This function is the same as the C++ method **OGRSFDriverRegistrar::GetDriverCount()** (p. 215).

#### Returns:

the drivers count.

References OGRSFDriverRegistrar::GetDriverCount(), and OGRGetDriverCount().

Referenced by OGRGetDriverCount().

### 17.9.2.156 OGRDataSourceH OGROpen (const char \* pszName, int bUpdate, OGRSFDriverH \* pahDriverList)

Open a file / data source with one of the registered drivers.

This function loops through all the drivers registered with the driver manager trying each until one succeeds with the given data source. This function is static. Applications don't normally need to use any other **OGRSFDriverRegistrar** (p. 214) function, not do they normally need to have a pointer to an **OGRSFDriverRegistrar** (p. 214) instance.

If this function fails, **CPLGetLastErrorMsg()** (p. 287) can be used to check if there is an error message explaining why.

This function is the same as the C++ method **OGRSFDriverRegistrar::Open()** (p. 215).

#### Parameters:

**pszName** the name of the file, or data source to open.

**bUpdate** FALSE for read-only access (the default) or TRUE for read-write access.

**pahDriverList** if non-NULL, this argument will be updated with a pointer to the driver which was used to open the data source.

#### Returns:

NULL on error or if the pass name is not supported by this driver, otherwise an handle to an **OGRDataSource** (p. 90). This **OGRDataSource** (p. 90) should be closed by deleting the object when it is no longer needed.

#### Example:

```
OGRDataSourceH hDS;
OGRSFDriverH    *pahDriver;

hDS = OGROpen( "polygon.shp", 0, pahDriver );
if( hDS == NULL )
{
    return;
}
```

```
... use the data source ...
```

```
OGRReleaseDataSource( hDS );
```

References OGROpen(), and OGRSFDriverRegistrar::Open().

Referenced by OGROpen().

#### 17.9.2.157 int OGRRegisterAll (void)

Register all drivers.

Referenced by OGRRegisterAll().

#### 17.9.2.158 void OGRRegisterDriver (OGRSFDriverH *hDriver*)

Add a driver to the list of registered drivers.

If the passed driver is already registered (based on handle comparison) then the driver isn't registered. New drivers are added at the end of the list of registered drivers.

This function is the same as the C++ method **OGRSFDriverRegistrar::RegisterDriver()** (p. 216).

##### Parameters:

*hDriver* handle to the driver to add.

References OGRSFDriverRegistrar::GetRegistrar(), OGRRegisterDriver(), and OGRSFDriverRegistrar::RegisterDriver().

Referenced by OGRRegisterDriver().

---

## 17.10 ogr\_core.h File Reference

```
#include "cpl_port.h"
#include "gdal_version.h"
```

### Classes

- class **OGREnvelope**
- union **OGRField**

### Defines

- #define **GDAL\_CHECK\_VERSION**(pszCallingComponentName) GDALCheckVersion(GDAL\_VERSION\_MAJOR, GDAL\_VERSION\_MINOR, pszCallingComponentName)

### Typedefs

- typedef enum **ogr\_style\_tool\_class\_id** OGRSTClassId
- typedef enum **ogr\_style\_tool\_units\_id** OGRSTUnitId
- typedef enum **ogr\_style\_tool\_param\_pen\_id** OGRSTPenParam
- typedef enum **ogr\_style\_tool\_param\_brush\_id** OGRSTBrushParam
- typedef enum **ogr\_style\_tool\_param\_symbol\_id** OGRSTSymbolParam
- typedef enum **ogr\_style\_tool\_param\_label\_id** OGRSTLabelParam

### Enumerations

- enum **OGRwkbGeometryType** {  
**wkbUnknown** = 0, **wkbPoint** = 1, **wkbLineString** = 2, **wkbPolygon** = 3,  
**wkbMultiPoint** = 4, **wkbMultiLineString** = 5, **wkbMultiPolygon** = 6, **wkbGeometryCollection** = 7,  
**wkbNone** = 100, **wkbLinearRing** = 101, **wkbPoint25D** = 0x80000001, **wkbLineString25D** = 0x80000002,  
**wkbPolygon25D** = 0x80000003, **wkbMultiPoint25D** = 0x80000004, **wkbMultiLineString25D** = 0x80000005, **wkbMultiPolygon25D** = 0x80000006,  
**wkbGeometryCollection25D** = 0x80000007 }
  - enum **OGRFieldType** {  
**OFTInteger** = 0, **OFTIntegerList** = 1, **OFTReal** = 2, **OFTRealList** = 3,  
**OFTString** = 4, **OFTStringList** = 5, **OFTWideString** = 6, **OFTWideStringList** = 7,  
**OFTBinary** = 8, **OFTDate** = 9, **OFTTime** = 10, **OFTDateTime** = 11 }
  - enum **OGRJustification**
  - enum **ogr\_style\_tool\_class\_id**
  - enum **ogr\_style\_tool\_units\_id**
  - enum **ogr\_style\_tool\_param\_pen\_id**
  - enum **ogr\_style\_tool\_param\_brush\_id**
  - enum **ogr\_style\_tool\_param\_symbol\_id**
  - enum **ogr\_style\_tool\_param\_label\_id**
-

## Functions

- const char \* **OGRGeometryTypeToName** (OGRwkbGeometryType eType)
- int **OGRParseDate** (const char \*pszInput, OGRField \*psOutput, int nOptions)
- int CPL\_STDCALL **GDALCheckVersion** (int nVersionMajor, int nVersionMinor, const char \*pszCallingComponentName)

### 17.10.1 Detailed Description

Core portability services for cross-platform OGR code.

### 17.10.2 Define Documentation

**17.10.2.1** `#define GDAL_CHECK_VERSION(pszCallingComponentName) GDALCheckVersion(GDAL_VERSION_MAJOR, GDAL_VERSION_MINOR, pszCallingComponentName)`

Helper macro for GDALCheckVersion

### 17.10.3 Typedef Documentation

**17.10.3.1** `typedef enum ogr_style_tool_param_brush_id OGRSTBrushParam`

List of parameters for use with OGRStyleBrush.

**17.10.3.2** `typedef enum ogr_style_tool_class_id OGRSTClassId`

OGRStyleTool derived class types (returned by GetType()).

**17.10.3.3** `typedef enum ogr_style_tool_param_label_id OGRSTLabelParam`

List of parameters for use with OGRStyleLabel.

**17.10.3.4** `typedef enum ogr_style_tool_param_pen_id OGRSTPenParam`

List of parameters for use with OGRStylePen.

**17.10.3.5** `typedef enum ogr_style_tool_param_symbol_id OGRSTSymbolParam`

List of parameters for use with OGRStyleSymbol.

**17.10.3.6** `typedef enum ogr_style_tool_units_id OGRSTUnitId`

List of units supported by OGRStyleTools.

---

## 17.10.4 Enumeration Type Documentation

### 17.10.4.1 enum ogr\_style\_tool\_class\_id

OGRStyleTool derived class types (returned by GetType()).

### 17.10.4.2 enum ogr\_style\_tool\_param\_brush\_id

List of parameters for use with OGRStyleBrush.

### 17.10.4.3 enum ogr\_style\_tool\_param\_label\_id

List of parameters for use with OGRStyleLabel.

### 17.10.4.4 enum ogr\_style\_tool\_param\_pen\_id

List of parameters for use with OGRStylePen.

### 17.10.4.5 enum ogr\_style\_tool\_param\_symbol\_id

List of parameters for use with OGRStyleSymbol.

### 17.10.4.6 enum ogr\_style\_tool\_units\_id

List of units supported by OGRStyleTools.

### 17.10.4.7 enum OGRFieldType

List of feature field types. This list is likely to be extended in the future ... avoid coding applications based on the assumption that all field types can be known.

#### Enumerator:

- OFTInteger* Simple 32bit integer
  - OFTIntegerList* List of 32bit integers
  - OFTReal* Double Precision floating point
  - OFTRealList* List of doubles
  - OFTString* String of ASCII chars
  - OFTStringList* Array of strings
  - OFTWideString* Double byte string (unsupported)
  - OFTWideStringList* List of wide strings (unsupported)
  - OFTBinary* Raw Binary data
  - OFTDate* Date
  - OFTTime* Time
  - OFTDateTime* Date and Time
-

#### 17.10.4.8 enum OGRJustification

Display justification for field values.

#### 17.10.4.9 enum OGRwkbGeometryType

List of well known binary geometry types. These are used within the BLOBs but are also returned from **OGRGeometry::getGeometryType()** (p. 133) to identify the type of a geometry object.

##### Enumerator:

- wkbUnknown** unknown type, non-standard
- wkbPoint** 0-dimensional geometric object, standard WKB
- wkbLineString** 1-dimensional geometric object with linear interpolation between Points, standard WKB
- wkbPolygon** planar 2-dimensional geometric object defined by 1 exterior boundary and 0 or more interior boundaries, standard WKB
- wkbMultiPoint** GeometryCollection of Points, standard WKB
- wkbMultiLineString** GeometryCollection of LineStrings, standard WKB
- wkbMultiPolygon** GeometryCollection of Polygons, standard WKB
- wkbGeometryCollection** geometric object that is a collection of 1 or more geometric objects, standard WKB
- wkbNone** non-standard, for pure attribute records
- wkbLinearRing** non-standard, just for createGeometry()
- wkbPoint25D** 2.5D extension as per 99-402
- wkbLineString25D** 2.5D extension as per 99-402
- wkbPolygon25D** 2.5D extension as per 99-402
- wkbMultiPoint25D** 2.5D extension as per 99-402
- wkbMultiLineString25D** 2.5D extension as per 99-402
- wkbMultiPolygon25D** 2.5D extension as per 99-402
- wkbGeometryCollection25D** 2.5D extension as per 99-402

### 17.10.5 Function Documentation

#### 17.10.5.1 int CPL\_STDCALL GDALCheckVersion (int *nVersionMajor*, int *nVersionMinor*, const char \* *pszCallingComponentName*)

Return TRUE if GDAL library version at runtime matches *nVersionMajor*.*nVersionMinor*.

The purpose of this method is to ensure that calling code will run with the GDAL version it is compiled for. It is primarily intended for external plugins.

##### Parameters:

- nVersionMajor*** Major version to be tested against
- nVersionMinor*** Minor version to be tested against
- pszCallingComponentName*** If not NULL, in case of version mismatch, the method will issue a failure mentioning the name of the calling component.

### 17.10.5.2 `const char* OGRGeometryTypeToName (OGRwkbGeometryType eType)`

Fetch a human readable name corresponding to an OGRwkbGeometryType value. The returned value should not be modified, or freed by the application.

This function is C callable.

#### Parameters:

*eType* the geometry type.

#### Returns:

internal human readable string, or NULL on failure.

References OGRGeometryTypeToName(), wkbGeometryCollection, wkbGeometryCollection25D, wkbLineString, wkbLineString25D, wkbMultiLineString, wkbMultiLineString25D, wkbMultiPoint, wkbMultiPoint25D, wkbMultiPolygon, wkbMultiPolygon25D, wkbNone, wkbPoint, wkbPoint25D, wkbPolygon, wkbPolygon25D, and wkbUnknown.

Referenced by OGRGeometryTypeToName().

### 17.10.5.3 `int OGRParseDate (const char * pszInput, OGRField * psField, int nOptions)`

Parse date string.

This function attempts to parse a date string in a variety of formats into the OGRField.Date format suitable for use with OGR. Generally speaking this function is expecting values like:

YYYY-MM-DD HH:MM:SS+nn

The seconds may also have a decimal portion (which is ignored). And just dates (YYYY-MM-DD) or just times (HH:MM:SS) are also supported. The date may also be in YYYY/MM/DD format. If the year is less than 100 and greater than 30 a "1900" century value will be set. If it is less than 30 and greater than -1 then a "2000" century value will be set. In the future this function may be generalized, and additional control provided through nOptions, but an nOptions value of "0" should always do a reasonable default form of processing.

The value of psField will be indeterminate if the function fails (returns FALSE).

#### Parameters:

*pszInput* the input date string.

*psField* the **OGRField** (p. 118) that will be updated with the parsed result.

*nOptions* parsing options, for now always 0.

#### Returns:

TRUE if apparently successful or FALSE on failure.

References OGRField::Date, OGRField::Day, OGRField::Hour, OGRField::Minute, OGRField::Month, OGRParseDate(), OGRField::Second, OGRField::TZFlag, and OGRField::Year.

Referenced by OGRParseDate(), and OGRFeature::SetField().

## 17.11 ogr\_feature.h File Reference

```
#include "ogr_geometry.h"
#include "ogr_featurestyle.h"
```

### Classes

- class **OGRFieldDefn**
- class **OGRFeatureDefn**
- class **OGRFeature**
- class **OGRFeatureQuery**

### 17.11.1 Detailed Description

Simple feature classes.

## 17.12 ogr\_geometry.h File Reference

```
#include "ogr_core.h"
#include "ogr_spatialref.h"
```

### Classes

- class **OGRRawPoint**
- class **OGRGeometry**
- class **OGRPoint**
- class **OGRCurve**
- class **OGRLineString**
- class **OGRLinearRing**
- class **OGRSurface**
- class **OGRPolygon**
- class **OGRGeometryCollection**
- class **OGRMultiPolygon**
- class **OGRMultiPoint**
- class **OGRMultiLineString**
- class **OGRGeometryFactory**

### 17.12.1 Detailed Description

Simple feature geometry classes.

## 17.13 ogr\_spatialref.h File Reference

```
#include "ogr_srs_api.h"
```

### Classes

- class **OGR\_SRSNode**
- class **OGRSpatialReference**
- class **OGRCoordinateTransformation**

### Functions

- **OGRCoordinateTransformation \* OGRCreateCoordinateTransformation (OGRSpatialReference \*poSource, OGRSpatialReference \*poTarget)**

#### 17.13.1 Detailed Description

Coordinate systems services.

#### 17.13.2 Function Documentation

##### 17.13.2.1 OGRCoordinateTransformation\* OGRCreateCoordinateTransformation (OGRSpatialReference \* *poSource*, OGRSpatialReference \* *poTarget*)

Create transformation object.

This is the same as the C function OCTNewCoordinateTransformation().

Input spatial reference system objects are assigned by copy (calling clone() method) and no ownership transfer occurs.

The delete operator, or OCTDestroyCoordinateTransformation() should be used to destroy transformation objects.

#### Parameters:

*poSource* source spatial reference system.

*poTarget* target spatial reference system.

#### Returns:

NULL on failure or a ready to use transformation object.

References OGRCreateCoordinateTransformation().

Referenced by OGRCreateCoordinateTransformation(), and OGRGeometry::transformTo().

---

## 17.14 ogr\_srs\_api.h File Reference

```
#include "ogr_core.h"
```

### Functions

- OGRErr **OSRImportFromWkt** (OGRSpatialReferenceH, char \*\*)
- OGRErr CPL\_STDCALL **OSRExportToWkt** (OGRSpatialReferenceH, char \*\*)
- OGRErr **OSRSetACEA** (OGRSpatialReferenceH hSRS, double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetAE** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetBonne** (OGRSpatialReferenceH hSRS, double dfStandardParallel, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetCEA** (OGRSpatialReferenceH hSRS, double dfStdP1, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetCS** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetEC** (OGRSpatialReferenceH hSRS, double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetEckert** (OGRSpatialReferenceH hSRS, int nVariation, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetEckertIV** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetEckertVI** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetEquirectangular** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetGS** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetGH** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetGEOS** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfSatelliteHeight, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetGnomonic** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetHOM** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfAzimuth, double dfRectToSkew, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetHOM2PNO** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfLat1, double dfLong1, double dfLat2, double dfLong2, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetKrovak** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfAzimuth, double dfPseudoStdParallelLat, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetLAEA** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetLCC** (OGRSpatialReferenceH hSRS, double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetLCC1SP** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)

- OGRErr **OSRSetLCCB** (OGRSpatialReferenceH hSRS, double dfStdP1, double dfStdP2, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetMC** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetMercator** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetMollweide** (OGRSpatialReferenceH hSRS, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetNZMG** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetOS** (OGRSpatialReferenceH hSRS, double dfOriginLat, double dfCMeridian, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetOrthographic** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetPolyconic** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetPS** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetRobinson** (OGRSpatialReferenceH hSRS, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetSinusoidal** (OGRSpatialReferenceH hSRS, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetStereographic** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetSOC** (OGRSpatialReferenceH hSRS, double dfLatitudeOfOrigin, double dfCentralMeridian, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetTM** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetTMVariant** (OGRSpatialReferenceH hSRS, const char \*pszVariantName, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetTMG** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetTMSO** (OGRSpatialReferenceH hSRS, double dfCenterLat, double dfCenterLong, double dfScale, double dfFalseEasting, double dfFalseNorthing)
- OGRErr **OSRSetVDG** (OGRSpatialReferenceH hSRS, double dfCenterLong, double dfFalseEasting, double dfFalseNorthing)
- char \*\* **OPTGetProjectionMethods** ()
- char \*\* **OPTGetParameterList** (const char \*pszProjectionMethod, char \*\*ppszUserName)
- int **OPTGetParameterInfo** (const char \*pszProjectionMethod, const char \*pszParameterName, char \*\*ppszUserName, char \*\*ppszType, double \*pdfDefaultValue)

### 17.14.1 Detailed Description

C spatial reference system services and defines.

See also: **ogr\_spatialref.h** (p. 391)

## 17.14.2 Function Documentation

**17.14.2.1** `int OPTGetParameterInfo (const char * pszProjectionMethod, const char * pszParameterName, char ** ppszUserName, char ** ppszType, double * pdfDefaultValue)`

Fetch information about a single parameter of a projection method.

### Parameters:

*pszProjectionMethod* name of projection method for which the parameter applies. Not currently used, but in the future this could affect defaults. This is the internal projection method name, such as "Transverse\_Mercator".

*pszParameterName* name of the parameter to fetch information about. This is the internal name such as "central\_meridian" (SRS\_PP\_CENTRAL\_MERIDIAN).

*ppszUserName* location at which to return the user visible name for the parameter. This pointer may be NULL to skip the user name. The returned name should not be modified or freed.

*ppszType* location at which to return the parameter type for the parameter. This pointer may be NULL to skip. The returned type should not be modified or freed. The type values are described above.

*pdfDefaultValue* location at which to put the default value for this parameter. The pointer may be NULL.

### Returns:

TRUE if parameter found, or FALSE otherwise.

**17.14.2.2** `char** OPTGetParameterList (const char * pszProjectionMethod, char ** ppszUserName)`

Fetch the parameters for a given projection method.

### Parameters:

*pszProjectionMethod* internal name of projection methods to fetch the parameters for, such as "Transverse\_Mercator" (SRS\_PT\_TRANSVERSE\_MERCATOR).

*ppszUserName* pointer in which to return a user visible name for the projection name. The returned string should not be modified or freed by the caller. Legal to pass in NULL if user name not required.

### Returns:

returns a NULL terminated list of internal parameter names that should be freed by the caller when no longer needed. Returns NULL if projection method is unknown.

**17.14.2.3** `char** OPTGetProjectionMethods ()`

Fetch list of possible projection methods.

### Returns:

Returns NULL terminated list of projection methods. This should be freed with `CSLDestroy()` (p. 308) when no longer needed.

---

**17.14.2.4 OGRErr CPL\_STDCALL OSRExportToWkt (OGRSpatialReferenceH *hSRS*, char \*\**ppszReturn*)**

Convert this SRS into WKT format.

This function is the same as **OGRSpatialReference::exportToWkt()** (p. 224).

References OSRExportToWkt().

Referenced by OSRExportToWkt().

**17.14.2.5 OGRErr OSRImportFromWkt (OGRSpatialReferenceH *hSRS*, char \*\**ppszInput*)**

Import from WKT string.

This function is the same as **OGRSpatialReference::importFromWkt()** (p. 240).

References OSRImportFromWkt().

Referenced by OSRImportFromWkt().

**17.14.2.6 OGRErr OSRSetACEA (OGRSpatialReferenceH *hSRS*, double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Albers Conic Equal Area

References OSRSetACEA().

Referenced by OSRSetACEA().

**17.14.2.7 OGRErr OSRSetAE (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Azimuthal Equidistant

References OSRSetAE().

Referenced by OSRSetAE().

**17.14.2.8 OGRErr OSRSetBonne (OGRSpatialReferenceH *hSRS*, double *dfStandardParallel*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Bonne

References OSRSetBonne().

Referenced by OSRSetBonne().

**17.14.2.9 OGRErr OSRSetCEA (OGRSpatialReferenceH *hSRS*, double *dfStdP1*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Cylindrical Equal Area

References OSRSetCEA().

Referenced by OSRSetCEA().

---

**17.14.2.10 OGRErr OSRSetCS (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Cassini-Soldner

References OSRSetCS().

Referenced by OSRSetCS().

**17.14.2.11 OGRErr OSRSetEC (OGRSpatialReferenceH *hSRS*, double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Equidistant Conic

References OSRSetEC().

Referenced by OSRSetEC().

**17.14.2.12 OGRErr OSRSetEckert (OGRSpatialReferenceH *hSRS*, int *nVariation*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Eckert I-VI

References OSRSetEckert().

Referenced by OSRSetEckert().

**17.14.2.13 OGRErr OSRSetEckertIV (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Eckert IV

References OSRSetEckertIV().

Referenced by OSRSetEckertIV().

**17.14.2.14 OGRErr OSRSetEckertVI (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Eckert VI

References OSRSetEckertVI().

Referenced by OSRSetEckertVI().

**17.14.2.15 OGRErr OSRSetEquirectangular (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Equirectangular

References OSRSetEquirectangular().

Referenced by OSRSetEquirectangular().

---

**17.14.2.16 OGRErr OSRSetGEOS (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfSatelliteHeight*, double *dfFalseEasting*, double *dfFalseNorthing*)**

GEOS - Geostationary Satellite View

References OSRSetGEOS().

Referenced by OSRSetGEOS().

**17.14.2.17 OGRErr OSRSetGH (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Goode Homolosine

References OSRSetGH().

Referenced by OSRSetGH().

**17.14.2.18 OGRErr OSRSetGnomonic (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Gnomonic

References OSRSetGnomonic().

Referenced by OSRSetGnomonic().

**17.14.2.19 OGRErr OSRSetGS (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Gall Stereographic

References OSRSetGS().

Referenced by OSRSetGS().

**17.14.2.20 OGRErr OSRSetHOM (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfAzimuth*, double *dfRectToSkew*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Hotine Oblique Mercator using azimuth angle

References OSRSetHOM().

Referenced by OSRSetHOM().

**17.14.2.21 OGRErr OSRSetHOM2PNO (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfLat1*, double *dfLong1*, double *dfLat2*, double *dfLong2*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Hotine Oblique Mercator using two points on centerline

References OSRSetHOM2PNO().

Referenced by OSRSetHOM2PNO().

---

**17.14.2.22 OGRErr OSRSetKrovak (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfAzimuth*, double *dfPseudoStdParallelLat*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Krovak Oblique Conic Conformal

References OSRSetKrovak().

Referenced by OSRSetKrovak().

**17.14.2.23 OGRErr OSRSetLAEA (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Azimuthal Equal-Area

References OSRSetLAEA().

Referenced by OSRSetLAEA().

**17.14.2.24 OGRErr OSRSetLCC (OGRSpatialReferenceH *hSRS*, double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic

References OSRSetLCC().

Referenced by OSRSetLCC().

**17.14.2.25 OGRErr OSRSetLCC1SP (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic 1SP

References OSRSetLCC1SP().

Referenced by OSRSetLCC1SP().

**17.14.2.26 OGRErr OSRSetLCCB (OGRSpatialReferenceH *hSRS*, double *dfStdP1*, double *dfStdP2*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Lambert Conformal Conic (Belgium)

References OSRSetLCCB().

Referenced by OSRSetLCCB().

**17.14.2.27 OGRErr OSRSetMC (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Miller Cylindrical

References OSRSetMC().

Referenced by OSRSetMC().

---

**17.14.2.28 OGRErr OSRSetMercator (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Mercator

References OSRSetMercator().

Referenced by OSRSetMercator().

**17.14.2.29 OGRErr OSRSetMollweide (OGRSpatialReferenceH *hSRS*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Mollweide

References OSRSetMollweide().

Referenced by OSRSetMollweide().

**17.14.2.30 OGRErr OSRSetNZMG (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

New Zealand Map Grid

References OSRSetNZMG().

Referenced by OSRSetNZMG().

**17.14.2.31 OGRErr OSRSetOrthographic (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Orthographic

References OSRSetOrthographic().

Referenced by OSRSetOrthographic().

**17.14.2.32 OGRErr OSRSetOS (OGRSpatialReferenceH *hSRS*, double *dfOriginLat*, double *dfCMeridian*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Oblique Stereographic

References OSRSetOS().

Referenced by OSRSetOS().

**17.14.2.33 OGRErr OSRSetPolyconic (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Polyconic

References OSRSetPolyconic().

Referenced by OSRSetPolyconic().

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**17.14.2.34 OGRErr OSRSetPS (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Polar Stereographic

References OSRSetPS().

Referenced by OSRSetPS().

**17.14.2.35 OGRErr OSRSetRobinson (OGRSpatialReferenceH *hSRS*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Robinson

References OSRSetRobinson().

Referenced by OSRSetRobinson().

**17.14.2.36 OGRErr OSRSetSinusoidal (OGRSpatialReferenceH *hSRS*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Sinusoidal

References OSRSetSinusoidal().

Referenced by OSRSetSinusoidal().

**17.14.2.37 OGRErr OSRSetSOC (OGRSpatialReferenceH *hSRS*, double *dfLatitudeOfOrigin*, double *dfCentralMeridian*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Swiss Oblique Cylindrical

References OSRSetSOC().

Referenced by OSRSetSOC().

**17.14.2.38 OGRErr OSRSetStereographic (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Stereographic

References OSRSetStereographic().

Referenced by OSRSetStereographic().

**17.14.2.39 OGRErr OSRSetTM (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Transverse Mercator

References OSRSetTM().

Referenced by OSRSetTM().

---

**17.14.2.40 OGRErr OSRSetTMG (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Tunesia Mining Grid

References OSRSetTMG().

Referenced by OSRSetTMG().

**17.14.2.41 OGRErr OSRSetTMSO (OGRSpatialReferenceH *hSRS*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Transverse Mercator (South Oriented)

References OSRSetTMSO().

Referenced by OSRSetTMSO().

**17.14.2.42 OGRErr OSRSetTMVariant (OGRSpatialReferenceH *hSRS*, const char \* *pszVariantName*, double *dfCenterLat*, double *dfCenterLong*, double *dfScale*, double *dfFalseEasting*, double *dfFalseNorthing*)**

Transverse Mercator variant

References OSRSetTMVariant().

Referenced by OSRSetTMVariant().

**17.14.2.43 OGRErr OSRSetVDG (OGRSpatialReferenceH *hSRS*, double *dfCenterLong*, double *dfFalseEasting*, double *dfFalseNorthing*)**

VanDerGrinten

References OSRSetVDG().

Referenced by OSRSetVDG().

---

## 17.15 ogrsf\_frmts.h File Reference

```
#include "ogr_feature.h"
#include "ogr_featurestyle.h"
```

### Classes

- class **OGRLayer**
- class **OGRDataSource**
- class **OGRSFDriver**
- class **OGRSFDriverRegistrar**

### Functions

- void **OGRRegisterAll** ()

#### 17.15.1 Detailed Description

Classes related to registration of format support, and opening datasets.

#### 17.15.2 Function Documentation

##### 17.15.2.1 void OGRRegisterAll (void)

Register all drivers.

References `OGRSFDriverRegistrar::AutoLoadDrivers()`, `OGRSFDriverRegistrar::GetRegistrar()`, and `OGRRegisterAll()`.

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