Feature Data Objects Open Source

Building FDO Open Source

FDO Open Source

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Building Feature Data Objects on Windows

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Introduction

This chapter describes:

- how to build the Feature Data Object binaries from the source files and install them on a Windows machine
- the build tools that you must install to do the build
- the database clients that you must install to do the build

NOTE The binaries built by this process include the unit test executables.

NOTE The Windows system documented here is XP.

Whether you intend to build applications on top of FDO or modify the FDO code itself, you must build the binaries from the source.

There are two ways to get the source. The build process is the same no matter which way you choose to obtain the source.

A briefer description of the build process is in OpenSourceBuild_README.txtfile in the build folder.

Get the Source

The FDO source code is located on the Open Source Geospatial Foundation website. You must first become a registered user of the site and then login before you can download source from the site. Go to *https://www.osgeo.org*. In the upper right-hand corner there is a link labeled Register. Click on this link and follow the instructions for registering and logging in. Once you have logged in, you may get the source by either downloading a gzipped tar file or doing a “checkout” from a set of Subversion repositories.

NOTE The “checkout” is read-only.

Gzipped Tarfile

Download the FDO gzipped tar files from *https://fdo.osgeo.org/downloads.html* to the build folder. The name of the build folder used in this document is C:\OpenSource. The filename has the format

<component>-<version>_<build>.tar.gz. The version number for the first release is 3.2.0. Use Winzip to extract the tar file to a temporary folder and use Winzip to extract the contents of the tar file to your build folder.

The version number for the first release is 3.2.0. The <build> element has the GXXX, for example, G001. The names of the gzipped tarfiles together with a description of the content follows.

- fdo-3.2.0_GXXX.tar.gz - source code for Fdo, utilities and third party components
- fdosdf-3.2.0_GXXX.tar.gz - SDF provider source code and test data
- fdoshp-3.2.0_GXXX.tar.gz - SHP provider source code and test data
- fdoarcsde-3.2.0_GXXX.tar.gz - ArcSDE provider source code
- fdowfs-3.2.0_GXXX.tar.gz - WFS provider source code
- fdowms-3.2.0_GXXX.tar.gz - WMS provider source code
- fdordbms-3.2.0_GXXX.tar.gz - source code for the MySQL and ODBC providers

Subversion Repositories

The FDO code is stored in Subversion repositories on the Open Source Geospatial Foundation website. Use a Subversion client to obtain the FDO source from these repositories. See the instructions in the "System Requirements" section on how to obtain a client. The instructions in this document are based on the use of the SVN command-line client.

The SVN client enables you to download files from a Subversion repository into a build folder. There is one repository for the utilities, fdo core and thirdparty components and one repository for each of the providers with the exeception of the MySQL and ODBC providers, which share a repository. A URL identifies the repository and a local path identifies the folder which receives the downloaded files. In this document the build folder is called C:\OpenSource.

To get the source from the repositories do the following in a cmd.exe window.

NOTE You will be prompted for a password.

1.
   ```
   svn checkout https://fdocore.osgeo.org/svn/fdocore/trunk
   /home/OpenSource --username yourusername
   ```

2.
   ```
   svn checkout
   https://fdoarcsde.osgeo.org/svn/fdoarcsde/trunk/Providers/ArcSDE
   /home/OpenSource/Providers/ArcSDE --username yourusername
   ```

3.
   ```
   svn checkout
   https://fdordbms.osgeo.org/svn/fdordbms/trunk/Providers/GenericRdbms
   /home/OpenSource/Providers/GenericRdbms --username yourusername
   ```

4.
   ```
   svn checkout
   https://fdosdf.osgeo.org/svn/fdosdf/trunk/Providers/SDF
   /home/OpenSource/Providers/SDF --username yourusername
   ```

5.
   ```
   svn checkout
   https://fdoshp.osgeo.org/svn/fdoshp/trunk/Providers/SHP
   /home/OpenSource/Providers/SHP --username yourusername
   ```

6.
   ```
   svn checkout
   https://fdowfs.osgeo.org/svn/fdowfs/trunk/Providers/WFS
   /home/OpenSource/Providers/WFS --username yourusername
   ```

7.
   ```
   svn checkout
   https://fdowms.osgeo.org/svn/fdowms/trunk/Providers/WMS
   /home/OpenSource/Providers/WMS --username yourusername
   ```

NOTE The fdocore components includes a script called checkoutsvn.bat, which can be used to get updates for the all of the components from the Subversion repositories.

Review the Copyright and Licensing Information

The copyright and licensing information for the FDO API is contained in the License_README.txt file in the build folder.

Update the Source

You can update the source by running the checkoutsvn.batscript.

In a cmd.exe window where the current directory is the build folder, enter `checkoutsvn -h`. The help text displayed is as follows:

- checkoutsvn.bat [-h] [-o=OutFolder] [-w=WithModule] [-u=UserId] [-p=UserPassword]
- Help: -h[elp]
- OutFolder: -o[utpath]=destination folder for files
- WithModule: -w[ith]=all(default), fdo, fdocore, thirdparty, providers, utilities, shp, sdf, wfs, wms, arcsde, rdbms
- User: -u[ser]=user id
- Password: -p[assword]=user password

You can update all of the source by by running the checkoutsvn.batscript in the build folder. The syntax is `checkoutsvn.bat -o=C:\OpenSource -u=yourusername -p=yourpassword`.

You can update the source for specified components by using the with option. The syntax is `checkoutsvn.bat -o=C:\OpenSource -u=yourusername -p=yourpassword -w=desiredComponent`.

The possible arguments for the with option are:

- `all` - checkout all source from the fdocore, fdoshp, fdosdf, fdowms, fdowfs, fdoarcsde and fdordbms subversions
- `providers` - checkout all source from the fdoshp, fdosdf, fdowms, fdowfs, fdoarcsde and fdordbms subversions
- `fdocore` - checkout all source from the fdocore.osgeo.org subversion
- `thirdparty` - checkout all source from the Thirdparty folder in the fdocore.osgeo.org subversion
- `fdo` - checkout all source from the Fdo folder in the fdocore.osgeo.org subversion
- `utilities` - checkout all source from the Utilities folder in the fdocore.osgeo.org subversion

- `arcsde` - checkout all source from the fdoarcsde.osgeo.org subversion
- `rdbms` - checkout all source from the fdordbms.osgeo.org subversion
- `sdf` - checkout all source from the fdosdf.osgeo.org subversion
- `shp` - checkout all source from the fdoshp.osgeo.org subversion
- `wfs` - checkout all source from the fdowfs.osgeo.org subversion
- `wms` - checkout all source from the fdowms.osgeo.org subversion

System Requirements

Repository Tool

You must install a Subversion client to get and update the Fdo source code. To browse the list of available clients, click the Developer tools link at the bottom of the *https://www.osgeo.org* page. Pick a client and follow the instructions there to obtain and install the client. The instructions in this document are based on the use of the SVN command-line client.

For the purpose of this document, the installer svn-1.3.1-setup.exe from *http://subversion.tigris.org/servlets/ProjectDocumentList?folderID=91* was run.

Build Tools

The following software is used during the process of building the FDO binaries.

Tool	Description
msbuild	the Visual Studio .NET build engine
vcbuild	the Visual C++ build engine
bison	a general purpose parser generator that converts a grammar description for an LALR context-free grammar into a C program to parse that grammar.. If you intend to change the .y files that define the FDO expression and filter language, you must install this utility.

Tool	Description
sed	(streams editor) is a text filter tool. It takes text input, performs one or more operations on the text and outputs the modified text. If you intend to change the .y files that define the FDO expression and filter language, you must install this utility.
perl	scripting language. This is used to build the FDO third-party OpenSSL components and to run the ArcSDE unit tests.

The following table shows the location of the binary build tools.

Tool	Path
msbuild.exe	C:\WINDOWS\Microsoft.NET\Framework\v2.0.50727
vcbuild.exe	C:\Program Files\Microsoft Visual Studio 8\VC\vcpackages
devenv.exe	C:\Program Files\Microsoft Visual Studio 8\Common7\IDE
bison.exe	C:\Program Files\GnuWin32\bin
sed.exe	C:\Program Files\GnuWin32\bin
perl.exe	C:\Perl\bin

Install the binary build tools to their default locations using the following install packages.

- msbuild - Microsoft .NET Framework Version 2.0 Redistributable Packge from *http://msdn.microsoft.com/netframework/downloads/updates/default.aspx*
- vcbuild.exe and devenv.exe - Microsoft Visual Studio 2005 from install CD
- bison.exe - bison-1.875-4.exe from *http://prdownloads.sourceforge.net/gnuwin32/*
- sed.exe - sed-4.1.4.exe from *http://gnuwin32.sourceforge.net/packages.html*
- perl.exe - *http://www.activestate.com/ActivePerl*

NOTE The bison and sed installers do not add C:\Program Files\GnuWin32\binto the system PATH variable but the setenvironment.bat script located in the build folder does. For this and other reasons, you must run this script before commencing the build. Before running this script read the topic on environment variables.

The following software is used during the process of building the FDO documentation.

Tool	Description
doxygen	generates API documentation from specially formattedcomments embedded in C++, C, Java, Objective-C, Python, IDL, PHP, C#, and D.
graphviz	is a graph drawing toolkit used by doxygen to draw class diagrams.
HTML Help Workshop	is the standard help system for the Windows platform. It is used to generate compressed html help (.chm) files. It is used by doxygen to generate .chm files containing the API documentation.

The following table shows the location of the documentation build tools.

Tool	Location
doxygen.exe	C:\Program Files\doxygen\bin
dot.exe	C:\Program Files\ATT\Graphviz\bin
hhc.exe	C:\Program Files\HTML Help Workshop

Install the documentation build tools using the following install packages.

- doxygen.exe - doxygen-1.4.6-setup.exe from *http://www.stack.nl/~dimitri/doxygen/download.html#latestsrc*
- dot.exe - graphviz-2.8.exe from *http://www.graphviz.org/Download_windows.php*
- hhc.exe - Htmlhelp.exe from *http://msdn.microsoft.com/library/en-us/htmlhelp/html/hwMicrosoftHTMLHelpDownloads.asp*

NOTE The doxygen and graphviz installers add their respective bin folders to the system PATH variable.

NOTE An alternate way to get to the HTML Help downloads page is to go to *http://msdn.microsoft.com/library*, double-click Win32 and COM Development, double-click Tools, double-click HTML Help, double-click Microsoft HTML Help 1.4 SDK, and then click Downloads.

Provider Dependencies

Building the two Rdbms-based FDO Providers, arcSDE and MySQL, is dependenct on client libraries being available.

ArcSDE 9.1 Client SDK

You must purchase the ArcSDE 9.1 client SDK from an ESRI vendor. There are instructions on how to purchase the client at *http://www.esri.com/software/arcgis/arcsde/how-to-buy.html*.

Install the client to a location outside of the build folder and set the value of the environment variable %SDEHOME% to that location. For the purpose this document %SDEHOME% is set to C:\ESRI\ArcSDEClient91\Windows\.

The list of ArcSDE client files follows.

- lib\icuuc.lib
- lib\pe91.lib
- lib\sde91.lib
- lib\sg91.lib
- include\sg.h
- include\sgerr.h
- include\pe.h
- include\pe_coordsys_from_prj.h
- include\pedef.h
- include\pef.h
- include\sdeerno.h
- include\sderaster.h

- include\sdetype.h
- bin\edgemt.dll
- bin\gsrvrdb291.dll
- bin\gsrvrinf91.dll
- bin\gsrvrora8i91.dll
- bin\gsrvrora9i91.dll
- bin\gsrvrsg191.dll
- bin\icudt221.dll
- bin\icuuc22.dll
- bin\libtiff.dll
- bin\loceng.dll
- bin\locssa.dll
- bin\mtchloc.dll
- bin\mtchmt.dll
- bin\pe91.dll
- bin\sde91.dll
- bin\sdedb2srvr91.dll
- bin\sdeinfsrvr91.dll
- bin\sdeora8isrvr91.dll
- bin\sdeora9isrvr91.dll
- bin\sdesqlsrvr91.dll
- bin\sg91.dll
- bin\xerces-c_2_1_0.dll

MySQL Client

Download a Windows (x86) installer of the latest production release of MySQL 5.0 from *http://dev.mysql.com/downloads/mysql/5.0.html*. Do a custom install to the default location (C:\Program Files\MySQL\MySQL Server 5.0); this allows you to request the installation of all of the developer components. The developer components are required for the MySQL provider build.

NOTE If you have PHP installed on your machine, make sure that C:\Program Files\MySQL\MySQL Server 5.0\bin precedes the PHP path in the PATH environment variable. The PHP installation contains a copy of the libmysql.dll and it is important for the operation of the MySQL provider that the correct DLL is used.

Disk Space

The worse case requirement for build and install disk space occurs if you build both the debug and release versions including the documentation and install the debug version. In this case you require 5.84GB of disk space. This requirement is exclusive of the disk space required for the Subversion client (), the build tools (1.84GB) and the ArcSDE and MySQL provider clients (113MB). The final total is 7.8GB.

Environment Variables

The setenvironment.bat script in the build folder sets the following environment variables required by the build.bat script.

- FDO
- FDOMYSQL
- FDOTHIRDPARTY
- FDOUTILITIES
- NLSDIR
- PATH
- SDEHOME

- XALANROOT
- XERCESCROOT

NOTE Review the script to verify that the paths for the .NET Framework, Graphviz, doxygen, and Visual Studio and the values for SDEHOME and FDOMYSQL are correct. You may wish to change some of these values to agree with how you have set up your environment.

NOTE The path to the HTML Help compiler (hhc.exe) does not have to be added to the PATH variable since the full path to the executable is specified in the configuration files used by doxygen to generate the API documentation.

In a cmd.exe window change directory to the build folder and run the setenvironment.bat script.

Modifying Microsoft Solution or Project Files

If you decide to modify the solution (.sln) or project (.vcproj) files, be aware that they use path references that contain environment variables defined in the setenvironment.bat script. Launch Developer Studio from a shell in which setenvironment.bat has been run. Then open the solution or project file using a file menu operation.

Building Feature Data Objects

Build Order

Build the thirdparty components first. Optionally generate the FDO filter and expression language grammar source files. Build the FDO and utility components. Finally build the providers.

Run the Build_thirdparty.bat Script

The assumption is that you are not changing the third-party software. So these binaries need only be built once. If you notice a third-party component has been updated during a run of checkoutsvn.bat, you must run this script again.

Optionally Run the Build_parse.bat Script

The FDO build uses several source (.cpp and .h) files generated from .y files by the Bison and Sed utilities. These .y files define a grammar for the FDO expression and filter language. If you change the .y files, you must run the build_parse.bat script to regenerate the source files.

Run the Build.bat Script

In the same cmd.exe window where you ran the setenvironment.bat script enter `build -h`. The build help text is contained in the following list:

- build.bat [-h] [-o=OutFolder] [-c=BuildType] [-a=Action] [-w=WithModule] [-d=BuildDocs]
- Help: -h[elp]
- OutFolder: -o[utpath]=destination folder for binaries
- BuildType: -c[onfig]=release(default), debug
- Action: -a[ction]=build(default), buildinstall, install, clean
- WithModule: -w[ith]=all(default), thirdparty, fdo, utilities, providers, shp, sdf, wfs, wms, arcsde, odbc, mysql
- BuildDocs: -d[ocs]=skip(default), build

A release version of all of the components together with the API documentation can be built using the following 2 commands:

- `build -o=C:\OutFolder`
- `build -o=C:\OutFolder -a=installonly -d=build`

Here is the sequence of commands usaed to write this document.

- `build -o=C:\OutFolder -w=thirdparty`
- `build -o=C:\OutFolder -w=fdo`
- `build -o=C:\OutFolder -a=install -w=fdo -d=build`
- `build -o=C:\OutFolder -w=arcsde`

- `build -o=C:\OutFolder -w=mysql`
- `build -o=C:\OutFolder -w=odbc`
- `build -o=C:\OutFolder -w=sdf`
- `build -o=C:\OutFolder -w=shp`
- `build -o=C:\OutFolder -w=wfs`
- `build -o=C:\OutFolder -w=wms`
- `build -o=C:\OutFolder -a=install -w=providers -d=build`
- `build -o=C:\OutFolder -w=thirdparty -a=debug`
- `build -o=C:\OutFolder -w=fdo -a=debug`
- `build -o=C:\OutFolder -w=providers -a=debug`

Build Outputs

Install Folder

The following table shows the contents of the install folders after building the various components.

NOTE The FDO open source distribution contains a providers.xml file. This file is used by FDO to identify where FDO provider binaries are installed. During the install process this file is copied from the build folder to the directory containing the FDO.dll file.

Target	Fdo\Bin	Fdo\Inc	Fdo\Lib	Fdo\Docs
Third-party	boost_thread-vc80-mt-1_32.dll, gdal13.dll, Xalan-C_1_7_0.dll, XalanMessages_1_7_0.dll, and xerces-c_2_5_0.dll			

Target	Fdo\Bin	Fdo\Inc	Fdo\Lib	Fdo\Docs
Fdo	FDO.dll, FDOCommon.dll, FDOGeometry.dll, FDOMessage.dll, FDOSpatial.dll, OSGeo.FDO.Common.dll, OSGeo.FDO.dll, OSGeo.FDO.Geometry.dll, OSGeo.FDO.Spatial.dll, and providers.xml	Common\, Fdo\, Geometry\, Common.h, Fdo.h, Geometry.h, Message.h, and Std.h	FDO.lib, FDOCommon.lib, and FDOGeometry.lib	FDO_API.chm, and FDO_API_managed.chm
ArcSDE	ArcSDEMessage.dll, ArcSDEProvider.dll			ARC_SDE_Provider_API.chm
MySQL	Com\, MySQLOverrides.dll, MySQLProvider.dll, OSGeo.FDO.Providers.MySQL.Overrides.dll, OSGeo.FDO.Providers.Rdbms.dll, OSGeo.FDO.Providers.Rdbms.Overrides.dll, RdbmsMsg.dll, SmMessage.dll	Rdbms\	MySQLOverrides.lib, RdbmsOverrides.lib	MySQL_Provider_API.chm
ODBC	ODBCOverrides.dll, ODBCProvider.dll, OSGeo.FDO.Providers.ODBC.Overrides.dll, OSGeo.FDO.Providers.Rdbms.dll, OSGeo.FDO.Providers.Rdbms.Overrides.dll, RdbmsMsg.dll, SmMessage.dll	Rdbms\	ODBCOverrides.lib, RdbmsOverrides.lib	ODBC_Provider_API.chm
SDF	SDFMessage.dll, SDFProvider.dll	SDF\		SDF_Provider_API.chm

Target	Fdo\Bin	Fdo\Inc	Fdo\Lib	Fdo\Docs
SHP	SHPMessage.dll, SHPOverrides.dll, SHPProvider.dll	SHP\	SHPOverrides.lib	SHP_Provider_API.chm
WFS	WFSMessage.dll, WFSProvider.dll			WFS_Provider_API.chm
WMS	OWS.dll, WMSMessage.dll, WMSOverrides.dll, WMSProvider.dll	WMS\	WMSOverrides.lib	WMS_Provider_API.chm

Unit Tests

Introduction

Unit test executables for the core Fdo components and for the SHP and SDF providers are generated during the build of the debug version.

The generated unit test executables (UnitTest.exe) are located as follows:

- C:\OpenSource\Fdo\Unmanaged\bin\win32\debug
- C:\OpenSource\Providers\SDF\bin\win32\debug
- C:\OpenSource\Providers\SHP\bin\win32\debug

The test data for the SDF and SHP providers is located as follows:

- C:\OpenSource\Providers\SDF\TestData
- C:\OpenSource\Providers\SHP\TestData

NOTE The SHP and SDF unit tests use relative paths to locate the test data.

Run the FDO Unit Tests

Do the following in a cmd.exe window:

1. `cd C:\OpenSource\Fdo\Unmanaged\bin\win32\debug`
2. `UnitTest`

The last line of output from these tests should be OK (124 tests)

Run the SDF Unit Tests

Do the following in a cmd.exe window:

1. `cd C:\OpenSource\Providers\SDF\Bin\Win32`
2. `Debug\UnitTest`

The last line of output from these tests should be OK (50 tests)

Run the SHP Unit Tests

Do the following in a cmd.exe window:

1. `cd C:\OpenSource\Providers\SHP\Src\UnitTest`
2. `..\..\Bin\Win32\Debug\UnitTest`

The last line of output from these tests should be OK (149 tests)

NOTE If you experience any failurs, you might try executing `C:\OpenSource\Providers\SHP\TestData\clean` in a cmd.exe window and retry executing the unit tests.

Supporting Information

Disk Space Calculation

Repository Tool

The disk space requirement for the Subversion client is 16.3 MB.

Build Tools

The following table shows the disk space requirements prior for the build tools.

Tool	Disk Space (MB)
bison 1.875 and sed 4.1.4	3.75
doxygen 1.4.6.	13.2
graphviz 2.8	12.0
Microsoft HTMLL Help 1.4 SDK	0.2
Microsoft .NET framework version 2.0	142
Microsoft Visual Studio 2005	1830
Total	1842

Provider Client Dependencies

The following table shows the disk space requirements prior for the thirdparty provider client components.

Client	Disk Space (MB)
ArcSDE 9.1	52.8
MySQL 5.0	60
Total	112.8

Pre-build Build Folder

The following table shows the inital disk space requirements prior to commencement of the build.

Folder	Disk Space (MB)
Fdo	46.3
Providers	405
Thirdparty	461
Utilities	16.1
Total	928

Post-build Build Folder

The following table shows the final disk space requirements for the build folder after completion of the release and debug builds.

Folder	Size (MB)
Thirdparty after building release version	707
Fdo after building release version	502
Providers after building release version	1350
Utilities after building release version	283
Total after building release version	2842
Thirdparty folder size after building release and debug versions	1570
Fdo folder size after building release and debug versions	848
Providers folder size after building release and debug versions	2620
Utilities folder size after building release and debug versions	611
Total after building release and debug versions	5649

Install Folder

The following table shows the disk space requirements for the install folder after completion of the release build and install.

Folder	Thirdparty Size (MB)	FDO Size (MB	Providers Size (MB)	Total Size (MB)
Fdo\Bin	7.7	2.7	8.4	18.8

Folder	Thirdparty Size (MB)	FDO Size (MB	Providers Size (MB)	Total Size (MB)
Fdo\Inc	0	2.0	0.4	2.4
Fdo\Lib	0	0.5	0.2	0.7
Fdo\Docs	0	19.4	2.1	158.5
Total	7.7	148.21	21.98	177.89

NOTE The total size of the Fdo/Docs folder includes the HTML folder shared by the FDO and Providers .chm files.

The following table shows the disk space requirements for the install folder after completion of the debug build and install.

Folder	Thirdparty Size (MB)	FDO Size (MB	Providers Size (MB)	Total Size (MB)
Fdo\Bin	10.8	4.1	19.2	34.1
Fdo\Inc	0	2.0	0.4	2.4
Fdo\Lib	0	0.5	0.2	0.7
Fdo\Docs	0	143.00	13.0	156
Total	10.8	149.6	32.8	193.2

Build Components

Build.bat Scripts and Visual Studio Solution Files

The name of the master FDO open source build script is build.bat, and it is located in the build folder (C:\OpenSource.

The table maps build.bat file to the build.bat it calls or the Visual Studio solution file whose processing it initiates. The '...' in the path names represents C:\OpenSource.

Controller	Controlled
...\build.bat	...\Fdo\build.bat ...\Providers\build.bat ...\Thirdparty\build.bat
...\Thirdparty\build.bat	...\Thirdparty\Thirdparty_fdo.sln ...\Thirdparty\Thirdparty_sdf.sln ...\Thirdparty\Thirdparty_wfs.sln ...\Thirdparty\Thirdparty_wms.sln ...\Thirdparty\boost_1_32_0\boost_1_32_0.vcproj
...\Fdo\build.bat	...\Fdo\FDO.sln
...\Providers\build.bat	...\Providers\ArcSDE\build.bat ...\Providers\GenericRdbms\src\MySql\build.bat ...\Providers\GenericRdbms\src\Odbc\build.bat ...\Providers\SHP\build.bat ...\Providers\SDF\build.bat ...\Providers\WFS\build.bat ...\Providers\WMS\build.bat
...\Providers\ArcSDE\build.bat	...\Providers\ArcSDE\Src\ArcSDE.sln
...\Providers\GenericRdbms\src\MySql\build.bat	...\Providers\GenericRdbms\Src\MySQL\MySql.sln
...\Providers\GenericRdbms\Src\ODBC\build.bat	...\Providers\GenericRdbms\Src\ODBC\Odbc.sln
...\Providers\SDF\build.bat	...\Providers\SDF\Src\SDFOS.sln
...\Providers\SHP\build.bat	...\Providers\SHP\Src\SHP.sln
...\Providers\WFS\build.bat	...\Providers\WFS\Src\WFS.sln
...\Providers\WMS\build.bat	...\Providers\WMS\Src\WMSOS.sln

Visual Studio Solution and Project Files

Thirdparty

The table maps third party solution (.sln) files to project (.vcproj) files. The '...' in the path names represents C:\OpenSource\Thirdparty.

Solution Files	Project Files
Thirdparty_fdo.sln	...\apache\xml-xalan\c\Projects\Win32\VC6\AllInOne\AllInOne.vcproj ...\apache\xml-xalan\c\Projects\Win32\VC6\Utils\Localization\Localization.vcproj ...\apache\xml-xerces\c\Projects\Win32\VC8\xerces-all\XercesLib\XercesLib.vcproj ...\cppunit\src\cppunit\cppunit.vcproj ...\cppunit\src\cppunit\cppunit_dll.vcproj ...\cppunit\src\msvc6\testrunner\TestRunner.vcproj ...\util\UpdateVersion\UpdateVersion.csproj
Thirdparty_sdf.sln	...\Sqlite3.1.5\Sqlite3.vcproj
Thirdparty_wfs.sln	...\libcurl\lib\curllib.vcproj ...\openssl\openssl.vcproj
Thirdparty_wms.sln	...\GDAL1.3\src\Gdal1.3.vcproj ...\libcurl\lib\curllib.vcproj ...\openssl\openssl.vcproj

FDO

The table maps the FDO solution (.sln) file to project (.vcproj) files. The '...' in the path names represents C:\OpenSource\Fdo.

Solution Files	Project Files
FDO.sln	...\Managed\Project\MgCommon.vcproj ...\Managed\Project\MgFDO.vcproj ...\Managed\Project\MgGeometry.vcproj ...\Managed\Project\MgSpatial.vcproj ...\UnitTest\UnitTest.vcproj ...\Unmanaged\Com-

Solution Files	Project Files
	mon.vcproj ...\Unmanaged\Fdo.vcproj ...\Unmanaged\FileToHdr.vcproj ...\Unmanaged\Geometry.vcproj ...\Unmanaged\McToMsf.vcproj ...\Unmanaged\Message.vcproj ...\Unmanaged\Nls.vcproj ...\Unmanaged\Spatial.vcproj

Providers

The table maps the provider solution (.sln) file to project (.vcproj) files. The '...' in the path names represents C:\OpenSource\Providers

Solution Files	Project Files
All	%FDOUTILITIES%\Common\FdoCommon.vcproj
ArcSDEOS.sln	...\ArcSDE\Src\Message\ArcSDEMessage.vcproj ...\ArcSDE\Src\Provider\ArcSDEProvider.vcproj
MySql.sln	...\GenericRdbms\Managed\Project\MgMySqlOverrides.vcproj ...\GenericRdbms\Src\MySQL\MySql.vcproj ...\GenericRdbms\Src\MySQL\Driver\MySqlDriver.vcproj ...\GenericRdbms\Src\MySQL\SchemaMgr\MySqlOverrides.vcproj ...\GenericRdbms\Src\MySQL\SchemaMgr\MySqlSchemaMgr.vcproj
Odbc.sln	...\GenericRdbms\Managed\Project\MgOdbcOverrides.vcproj ...\GenericRdbms\Src\ODBC\Odbc.vcproj ...\GenericRdbms\Src\ODBC\SchemaMgr\OdbcOverrides.vcproj ...\GenericRdbms\Src\ODBC\SchemaMgr\OdbcSchemaMgr.vcproj ...\GenericRdbms\Src\ODBCDriver\odbcdr.vcproj
MySql.sln and Odbc.sln	%FDOUTILITIES%\SchemaMgr\LogicalPhysical.vcproj %FDOUTILITIES%\SchemaMgr\Physical.vcproj %FDOUTILITIES%\SchemaMgr\SchemaMgr.vcproj %FDOUTILITIES%\SchemaMgr\SmMessage.vcproj %FDOUTILITIES%\SchemaMgr\Overrides.vcproj ...\GenericRdbms\Managed\Project\MgRdbms.vcproj ...\GenericRdbms\Man-

Solution Files	Project Files
	aged\Project\MgRdbmsOverrides.vcproj ...\GenericRdbms\Nls\fdordbms.vcproj ...\GenericRdbms\Src\Fdo\Fdo.vcproj ...\GenericRdbms\Src\Gdbi\Gdbi.vcproj ...\GenericRdbms\Src\Geometry\Fgf\geometry_fgf.vcproj ...\GenericRdbms\Src\LongTransactionManager\LongTransactionManager.vcproj ...\GenericRdbms\Src\Rdbi\Rdbi.vcproj ...\GenericRdbms\Src\SchemaMgr\GrdSchemaMgr.vcproj ...\GenericRdbms\Src\SchemaMgr\RdbmsOverrides.vcproj ...\GenericRdbms\Src\Util\util.vcproj
SDFOS.sln	%FDOUTILITIES%\SQLiteInterface\SQLiteInterface.vcproj ...\SDF\Src\Message\SDFMessage.vcproj ...\SDF\Src\Provider\SDF.vcproj ...\SDF\Src\Utils\FDOUtils.vcproj ...\SDF\Src\UnitTest\UnitTest.vcproj
SHP.sln	...\SHP\Managed\project\MgShapeOverrides.vcproj ...\SHP\Src\Message\ShpMessage.vcproj ...\SHP\Src\Overrides\ShpOverrides.vcproj ...\SHP\Src\Provider\ShpProvider.vcproj ...\SHP\Src\ShpRead\ShpRead.vcproj ...\SHP\Src\ShpSpatialIndex\ShpSpatialIndex.vcproj ...\SHP\Src\UnitTest\UnitTest.vcproj
WFSOS.sln	%FDOUTILITIES%\OWS\OWS.vcproj ...\WFS\Src\Message\WFSMessage.vcproj ...\WFS\Src\Provider\WFSProvider.vcproj ...\WFS\Src\UnitTest\UnitTest.vcproj
WMSOS.sln	%FDOUTILITIES%\OWS\OWS.vcproj ...\WMS\Managed\Project\MgWmsOverrides.vcproj ...\WMS\Src\Message\WMSMessage.vcproj ...\WMS\Src\Overrides\WMSOverrides.vcproj ...\WMS\Src\Provider\WMSProvider.vcproj

Build Outputs

Thirdparty

The following table maps Visual Studio project files for the third party components to output files. The '...' in the path names represents C:\OpenSource\Thirdparty.

Project Files	Output Folder	Output Files
AllInOne.vcproj	...\apache\xml-xalan\c\Build\Win32\VC8\Release	Xalan-C_1_7_0.dll, Xalan-C_1.lib
AllInOne.vcproj	...\apache\xml-xalan\c\Build\Win32\VC8\Debug	Xalan-C_1_7_0D.dll, Xalan-C_1D.lib
Localization.vcproj	...\apache\xml-xalan\c\Build\Win32\VC8\Release	XalanMessages_1_7_0.dll XalanMessages_1_7_0.lib
Localization.vcproj	...\apache\xml-xalan\c\Build\Win32\VC8\Debug	XalanMessages_1_7_0D.dll XalanMessages_1_7_0D.lib
boost_1_32_0.vcproj	...\boost_1_32_0\bin\boost\libs\thread\build\boost_thread.dll\vc-8_0\release\threading-multi	boost_thread-vc80-mt-1_32.dll
cppunit.vcproj	...\cppunit\lib	cppunit.lib
cppunit_dll.vcproj	...\cppunit\lib	cppunit_dll.dll, cppunit_dll.lib
curllib.vcproj	...\libcurl\lib\Release	libcurl.lib
curllib.vcproj	...\libcurl\lib\Debug	libcurl.lib
Gdal1.3.vcproj	...\GDAL1.3\src	gdal.13.dll
openssl.vcproj	...\openssl\lib\Release, ..\openssl\lib\Debug	libeay32.lib, ssleay32.lib

Project Files	Output Folder	Output Files
Sqlite3.vcproj	...\Sqlite3.1.5\Release, ...\Sqlite3.1.5\Debug	Sqlite3.lib
TestRunner.vcproj	...\cppunit\lib	testrunner.dll, testrunner.lib, testrunnerd.dll, testrunnerd.lib
UpdateVersion.csproj	...\util\UpdateVersion\build	UpdateVersion.exe
XercesLib.vcproj	...\apache\xml-xerces\c\Build\Win32\VC8\Release	xerces-c_2.lib xerces-c_2_5_0.dll
XercesLib.vcproj	...\apache\xml-xerces\c\Build\Win32\VC8\Debug	xerces-c_2D.lib, xerces-c_2_5_0D.dll

FDO

The following table maps Visual Studio project files for the FDO components to output files. The '...' in the path names represents C:\OpenSource\Fdo.

Project File	Output Folder	Output Files
MgCommon.vcproj	...\Managed\bin\release, ...\Managed\bin\debug	OSGeo.FDO.Common.dll
MgFDO.vcproj	...\Managed\bin\release, ...\Managed\bin\debug	OSGeo.FDO.dll
MgGeometry.vcproj	....\Managed\bin\release, ...\Managed\bin\debug	OSGeo.FDO.Geometry.dll
MgSpatial.vcproj	....\Managed\bin\release, ...\Managed\bin\debug	OSGeo.FDO.Spatial.dll
UnitTest.vcproj	...\Unmanaged\Bin\Win32\Release	unit_test.exe
UnitTest.vcproj	...\Unmanaged\Bin\Win32\debug	UnitTest.exe

Project File	Output Folder	Output Files
Common.vcproj	...\Unmanaged\Bin\Win32\Release ...\Unmanaged\bin\Win32\debug	FDOCommon.dll
Common.vcproj	...\Unmanaged\lib\Win32\Release ...\Unmanaged\Lib\Win32\debug	FDOCommon.lib
Fdo.vcproj	...\Unmanaged\Bin\Win32\Release ...\Unmanaged\bin\Win32\debug	FDO.dll
Fdo.vcproj	...\Unmanaged\lib\Win32\Release ...\Unmanaged\Lib\Win32\debug	FDO.lib
FileToHdr.vcproj	...\Unmanaged\Bin\Win32\Release, ...\Unmanaged\Bin\Win32\debug	FileToHdr.exe
Geometry.vcproj	...\Unmanaged\Bin\Win32\Release ...\Unmanaged\bin\Win32\debug	FDOGeometry.dll
Geometry.vcproj	...\Unmanaged\lib\Win32\Release ...\Unmanaged\Lib\Win32\debug	FDOGeometry.lib
McToMsf.vcproj	...\Unmanaged\Bin\Win32\Release, ...\Unmanaged\Bin\Win32\debug	McToMsf.exe
Message.vcproj	...\Unmanaged\Bin\Win32\Release ...\Unmanaged\bin\Win32\debug	FDOMessage.dll
Message.vcproj	...\Unmanaged\lib\Win32\Release ...\Unmanaged\Lib\Win32\debug	FDOMessage.lib
Nls.vcproj	...\Unmanaged\Lib\Win32\Release, ...\Unmanaged\Lib\Win32\debug	FDONLS.lib
Spatial.vcproj	...\Unmanaged\Bin\Win32\Release ...\Unmanaged\bin\Win32\debug	FDOSpatial.dll

Project File	Output Folder	Output Files
Spatial.vcproj	...\Unmanaged\lib\Win32\Release ...\Unmanaged\Lib\Win32\debug	FDOSpatial.lib

Providers

The following table maps Visual Studio project files for the provider components to output files. The '...' in the path names represents C:\OpenSource\Providers.

Project File	Output Folder	OutFile Files
ArcSDEMessage.vcproj	...\ArcSDE\Src\Provider\Bin\Win32\Release ...\ArcSDE\Src\Provider\bin\Win32\debug	ArcSDEMessage.dll
ArcSDEMessage.vcproj	...\ArcSDE\Src\Provider\lib\Win32\Release ...\ArcSDE\Src\Provider\Lib\Win32\debug	ArcSDEMessage.lib
ArcSDEProvider.vcproj	...\ArcSDE\Src\Provider\Bin\Win32\Release ...\ArcSDE\Src\Provider\bin\Win32\debug	ArcSDEProvider.dll
ArcSDEProvider.vcproj	...\ArcSDE\Src\Provider\lib\Win32\Release ...\ArcSDE\Src\Provider\Lib\Win32\debug	ArcSDEProvider.lib
Fdo.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	FdoGeneric.lib
fdordbms.vcproj	...\GenericRdbms\Bin\Win32\Release, ...\GenericRdbms\bin\Win32\debug	RdbmsMsg.dll
FDOUtils.vcproj	...\SDF\Lib\Win32\Release, ...\SDF\Lib\Win32\debug	FDOUtils.lib
Gdbi.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	Gdbi.lib

Project File	Output Folder	OutFile Files
geometry_fgf.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	geometry_fgf.lib
GrdSchemaMgr.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	GrdSchemaMgr.lib
LongTransactionManager.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	LongTransactionManager.lib
MgMySqlOverrides.vcproj	...\GenericRdbms\Managed\Bin\Release, ...\GenericRdbms\Managed\Bin\debug	OSGeo.FDO.Providers.MySQL.Overrides.dll
MgOdbcOverrides.vcproj	...\GenericRdbms\Managed\Bin\Release, ..\GenericRdbms\Managed\Bin\debug	OSGeo.FDO.Providers.ODBC.Overrides.dll
MgRdbms.vcproj	...\GenericRdbms\Managed\Bin\Release, ...\GenericRdbms\Managed\Bin\debug	OSGeo.FDO.Providers.Rdbms.dll
MgRdbmsOverrides.vcproj	...\GenericRdbms\Managed\Bin\Release, ...\GenericRdbms\Managed\Bin\debug	OSGeo.FDO.Providers.Rdbms.Overrides.dll
MgShapeOverrides.vcproj	...\SHP\Managed\Bin\Release, ..\SHP\Managed\Bin\debug	OSGeo.FDO.Providers.SHP.Overrides.dll
MgWmsOverrides.vcproj	...\WMS\Managed\bin\release, ...\WMS\Managed\bin\debug	OSGeo.FDO.Providers.WMS.Overrides.dll
MySql.vcproj	...\GenericRdbms\Bin\Win32\Release, ...\GenericRdbms\bin\Win32\debug	MySQLProvider.dll
MySql.vcproj	...\GenericRdbms\lib\Win32\Release ...\GenericRdbms\Lib\Win32\debug	MySql.lib
MySqlDriver.vcproj	...\GenericRdbms\Lib\Win32\Release, ...\GenericRdbms\Lib\Win32\debug	MySqlDriver.lib

Project File	Output Folder	OutFile Files
MySqlOverrides.vcproj	...\GenericRdbms\Bin\Win32\Release ...\GenericRdbms\bin\Win32\debug	MySQLOverrides.dll
MySqlOverrides.vcproj	...\GenericRdbms\lib\Win32\Release ...\GenericRdbms\Lib\Win32\debug	MySQLOverrides.lib
MySqlSchemaMgr.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	MySqlSchemaMgr.lib
Odbc.vcproj	...\GenericRdbms\Bin\Win32\Release ...\GenericRdbms\bin\Win32\debug	ODBCProvider.dll
Odbc.vcproj	...\GenericRdbms\lib\Win32\Release ...\GenericRdbms\Lib\Win32\debug	Odbc.pdb Odbc.lib
odbcdr.vcpro	..\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	ODBCDriver.lib
OdbcOverrides.vcproj	...\GenericRdbms\Bin\Win32\Release ...\GenericRdbms\bin\Win32\debug	ODBCOverrides.dll
OdbcOverrides.vcproj	...\GenericRdbms\lib\Win32\Release ...\GenericRdbms\Lib\Win32\debug	ODBCOverrides.lib
OdbcSchemaMgr.vcproj	...\GenericRdbms\Lib\Win32\Release, ...\GenericRdbms\Lib\Win32\debug	OdbcSchemaMgr.lib
Rdbi.vcproj	...\GenericRdbms\Lib\Win32\Release, ..\GenericRdbms\Lib\Win32\debug	Rdbi.lib
RdbmsOverrides.vcproj	...\GenericRdbms\Bin\Win32\Release ...\GenericRdbms\bin\Win32\debug	RdbmsOverrides.dll
RdbmsOverrides.vcproj	...\GenericRdbms\lib\Win32\Release ...\GenericRdbms\Lib\Win32\debug	RdbmsOverrides.lib

Project File	Output Folder	OutFile Files
SDF.vcproj	...\SDF\Bin\Win32\Release ...\SDF\bin\Win32\debug	SDFProvider.dll
SDFMessage.vcproj	...\SDF\Bin\Win32\Release, ...\SDF\Bin\Win32\debug	SDFMessage.dll
ShpMessage.vcproj	...\SHP\Bin\Win32\Release, ..\SHP\Bin\Win32\debug	SHPMessage.dll
ShpOverrides.vcproj	...\SHP\Bin\Win32\Release ...\SHP\bin\Win32\debug	SHPOverrides.dll
ShpOverrides.vcproj	...\SHP\lib\Win32\Release ...\SHP\Lib\Win32\debug	SHPOverrides.lib
ShpProvider.vcproj	...\SHP\Bin\Win32\Release ...\SHP\bin\Win32\debug	SHPProvider.dll
ShpProvider.vcproj	...\SHP\lib\Win32\Release ...\SHP\Lib\Win32\debug	SHPProvider.lib
ShpRead.vcproj	...\SHP\Lib\Win32\Release, ..\SHP\Lib\Win32\debug	SHPRead.lib
ShpSpatialIndex.vcproj	...\SHP\Lib\Win32\Release, ..\SHP\Lib\Win32\debug	SHPSpatialIndex.lib
util.vcproj	...\GenericRdbms\Lib\Win32\Release, ...\GenericRdbms\Lib\Win32\debug	util.lib
...\SDF\Src\UnitTest\UnitTest.vcproj	...\SDF\Bin\Win32\debug	UnitTest.exe
...\SHP\Src\UnitTest\UnitTest.vcproj	...\SHP\Bin\Win32\debug	UnitTest.exe

Project File	Output Folder	OutFile Files
WFSMessage.vcproj	...\WFS\Bin\Win32\Release, ...\WFS\Bin\Win32\debug	WFSMessage.dll
WFSProvider.vcproj	...\WFS\Bin\Win32\Release ...\WFS\bin\Win32\debug	WFSProvider.dll
WFSProvider.vcproj	...\WFS\lib\Win32\Release ...\WFS\Lib\Win32\debug	WFSProvider.lib
WMSMessage.vcproj	...\WMS\Bin\win32\release	WMSMessage.dll
WMSOverrides.vcproj	...\WMS\Bin\win32\release ...\WMS\bin\win32\debug	WMSOverrides.dll
WMSOverrides.vcproj	...\WMS\lib\win32\release ...\WMS\lib\win32\debug	WMSOverrides.lib
WMSProvider.vcproj	...\WMS\Bin\win32\release ...\WMS\bin\win32\debug	WMSProvider.dll
WMSProvider.vcproj	...\WMS\lib\win32\release ...\WMS\lib\win32\debug	WMSProvider.lib

Utilities

The following table maps Visual Studio project files for the utility components to output files. The '...' in the path names represents C:\OpenSource\Utilities.

Project File	Output Folder	Output Files
OWS.vcproj	..\OWS\Bin\Win32\Release, ..\OWS\Bin\Win32\debug	OWS.dll
OWS.vcproj	..\OWS\Lib\Win32\Release, ..\OWS\Lib\Win32\debug	OWS.lib

Project File	Output Folder	Output Files
SchemaMgr.vcproj	...\SchemaMgr\lib\win32\release, ..\SchemaMgr\lib\win32\debug	SchemaMgrNew.lib
Physical.vcproj	...\SchemaMgr\Lib\Win32\Release, ...\SchemaMgr\Lib\Win32\debug	SchemaMgr_PHNew.lib
SmMessage.vcproj	...\SchemaMgr\Bin\Win32\Release, ...\SchemaMgr\Bin\Win32\debug	SmMessage.dll
Overrides.vcproj	...\SchemaMgr\Lib\Win32\Release, ..\SchemaMgr\Lib\Win32\debug	SchemaMgr_OVNew.lib
LogicalPhysical.vcproj	...\SchemaMgr\Lib\Win32\Release, ...\SchemaMgr\Lib\Win32\	SchemaMgr_LPNew.lib
SQLiteInterface.vcproj	...\SQLiteInterface\lib\win32\release, ...\SQLiteInterface\lib\win32\debug	SQLiteInterface.lib

2

Build Feature Data Objects on Linux

In this chapter

Introduction

This chapter describes:

- how to build the Feature Data Object binaries from the source files and install them on a Linux machine
- the build tools that you must install to do the build
- the database clients that you must install to do the build

NOTE The binaries built by this process include the unit test executables.

NOTE The Linux system documented here is Red Hat ES 3.0.

Whether you intend to build applications on top of FDO or modify the FDO code itself, you must build the binaries.

There are two ways to get the source. The build process is the same no matter which way you choose to obtain the source.

A briefer description of the build process is in OpenSourceBuild_README.txtfile in the build directory.

Get the Source

The FDO source code is located on the Open Source Geospatial Foundation website. You must first become a registered user of the site and then login before you can download source from the site. Go to *https://www.osgeo.org*. In the upper right-hand corner there is a link labeled Register. Click on this link and follow the instructions for registering and logging in. Once you have logged in, you may get the source by either downloading a gzipped tar file or doing a “checkout” from a set of Subversion repositories.

NOTE The “checkout” is read-only.

Gzipped Tarfile

Download the FDO gzipped tar file from *https://fdo.osgeo.org/downloads.html* to the build directory. The name of the build directory used in this document is /home/OpenSource. The filename has the format <component>-<version>_<build>.tar.gz

The version number for the first release is 3.2.0. The <build> element has the GXXX, for example, G001. The names of the gzipped tarfiles together with a description of the content follows.

- fdo-3.2.0_GXXX.tar.gz - source code for Fdo, utilities and third party components
- fdosdf-3.2.0_GXXX.tar.gz - SDF provider source code and test data
- fdoshp-3.2.0_GXXX.tar.gz - SHP provider source code and test data
- fdoarcsde-3.2.0_GXXX.tar.gz - ArcSDE provider source code
- fdowfs-3.2.0_GXXX.tar.gz - WFS provider source code
- fdowms-3.2.0_GXXX.tar.gz - WMS provider source code
- fdordbms-3.2.0_GXXX.tar.gz - source code for the MySQL and ODBC providers

Gunzip the tar.gz file, mv the tar file to the build directory, and tar -xvf the tar file.

Subversion Repositories

The FDO code is stored in Subversion repositories on the Open Source Geospatial Foundation website. Use a Subversion client to obtain the FDO source from these repositories. To browse the list of available clients, click the Developer tools link at the bottom of the *https://www.osgeo.org* page. Pick a client and follow the instructions there to obtain and install the client. The instructions in this document are based on the use of the SVN command-line client.

The SVN client enables you to download files from a Subversion repository into a build directory. There is one repository for the utilities, fdo core and thirdparty components and one repository for each of the providers with the exeception of the MySQL and ODBC providers, which share a repository. A URL identifies the repository and a local path identifies the directory which receives the downloaded files. In this document the build directory is called /home/OpenSource.

To get the source from the repositories execute the following commands in a terminal window.

NOTE You will be prompted for a password.

1.
   ```
   svn checkout https://fdocore.osgeo.org/svn/fdocore/trunk
   /home/OpenSource --username yourusername
   ```

2.
   ```
   svn checkout
   https://fdoarcsde.osgeo.org/svn/fdoarcsde/trunk/Providers/ArcSDE
   /home/OpenSource/Providers/ArcSDE --username yourusername
   ```

3.
   ```
   svn checkout
   https://fdordbms.osgeo.org/svn/fdordbms/trunk/Providers/GenericRdbms
   /home/OpenSource/Providers/GenericRdbms --username yourusername
   ```

4.
   ```
   svn checkout
   https://fdosdf.osgeo.org/svn/fdosdf/trunk/Providers/SDF
   /home/OpenSource/Providers/SDF --username yourusername
   ```

5.
   ```
   svn checkout
   https://fdoshp.osgeo.org/svn/fdoshp/trunk/Providers/SHP
   /home/OpenSource/Providers/SHP --username yourusername
   ```

6.
   ```
   svn checkout
   https://fdowfs.osgeo.org/svn/fdowfs/trunk/Providers/WFS
   /home/OpenSource/Providers/WFS --username yourusername
   ```

7.
   ```
   svn checkout
   https://fdowms.osgeo.org/svn/fdowms/trunk/Providers/WMS
   /home/OpenSource/Providers/WMS --username yourusername
   ```

NOTE The fdocore components includes a script called checkoutsvn.sh, which can be used to get updates for the all of the components from the Subversion repositories.

Review the Copyright and Licensing Information

The copyright and licensing information for the FDO API is contained in the License_README.txt file in the build folder.

Updating the Source

You can update all of the source by running the checkoutsvn.shscript in the build directory. The syntax is `./checkoutsvn.sh --o /home/OpenSource --u yourusername --p yourpassword`.

You can update the source for specified components by using the with option. The syntax is `./checkoutsvn.sh --o /home/OpenSource --u yourusername --p yourpassword --w desiredComponent`.

The possible arguments for the with option are:

- `all` - updates all directories except Thirdparty
- `providers` - updates the ArcSDE, GenericRdbms, SDF, SHP, WFS, and WMS directories
- `fdocore` - updates the Fdo and Utilities directories
- `thirdparty` - updates the Thirdparty directory
- `fdo` - updates the Fdo directory
- `utilities` - updates the Utilities directory
- `arcsde` - updates the ArcSDE directory
- `rdbms` - updates the GenericRdbms directory, which contains the MySQL and ODBC components
- `sdf` - updates the SDF directory
- `shp` - updates the SHP directory
- `wfs` - updates the WFS directory
- `wms` - updates the WMS directory

System Requirements

Repository Tool

You must install a Subversion client to get and update the Fdo source code. To browse the list of available clients, click the Developer tools link at the bottom of the *https://www.osgeo.org* page. Pick a client and follow the instructions there to obtain and install the client. The instructions in this document are based on the use of the SVN command-line client.

For the purpose of this document, the following RPMs from *http://the.earth.li/pub/subversion/summersoft.fay.ar.us/pub/subversion/latest/rhel-3/bin/* were installed.

- subversion-1.3.1-1.rhel3.i386.rpm
- neon-0.24.7-1.i386.rpm
- mod_dav_svn-1.3.1-1.rhel3.i386.rpm

NOTE mod_dav_svn-1.3.1-1 requires a version of httpd >= 2.0.46. The required version of httpd was already present on the test machine.

NOTE The rpm install puts the svn binary in /usr/bin

Build Tools

The following software is used during the process of building the FDO binaries.

Tool	Description
autoconf	produces shell scripts to configure software source code packages automatically; depends on GNU m4 (version 1.4 or greater)
automake	generates makefile.in files from makefile.am input files
make	controls the generation of executables and other non-source files of a program from the program's source files
bison	a general purpose parser generator that converts a grammar description for an LALR context-free grammar into a C program to parse that grammar.
sed	(streams editor) is a text filter tool. It takes text input, performs one or more operations on the text and outputs the modified text.

Tool	Description
perl	scripting language. This is used to build the FDO third-party OpenSSL components and to run the ArcSDE unit tests.

autoconf, automake, make, perl, and bison are in /usr/bin. sed is in /bin. By default, /usr/bin is in the PATH environment variable.

All of the build tools are part of the Linux distribution by default.

NOTE The FDO build requires the use of bison version 1.875. This happens to be the installed version on the Red Hat Linux machine used during the writing of this document. You can obtain an rpm for version 1.875-5 from *http://rpmfind.net/linux/RPM/fedora/1/i386/bison-1.875-5.i386.html*.

The following software is used during the process of building the FDO documentation.

Tool	Description
doxygen	generates API documentation from specially formattedcomments embedded in C++, C, Java, Objective-C, Python, IDL, PHP, C#, and D.
graphviz	is a graph drawing toolkit used by doxygen to draw class diagrams. The graphviz executable used by doxygen is dot.exe.

The following table shows the location of the documentation build tools.

Tool	Location
doxygen	/usr/local/bin
dot	/usr/bin

The documentation build tools are part of the Linux distribution by default.

Provider Dependencies

Building the ArcSDE, MySQL, and ODBC providers is dependenct on client libraries being available.

ArcSDE 9.1 Client SDK

You must purchase the ArcSDE 9.1 client SDK from an ESRI vendor. There are instructions on how to purchase the client at *http://www.esri.com/software/arcgis/arcsde/how-to-buy.html*.

Install the client to a location outside of the build directory. The build script uses the SDEHOME environment variable to find the client headers and libraries. For more information about the SDEHOME variable, read the section entitled “Environment Variables.”

The list of ArcSDE client files follows.

- include\sg.h
- include\sgerr.h
- include\pe.h
- include\pe_coordsys_from_prj.h
- include\pedef.h
- include\pef.h
- include\sdeerno.h
- include\sderaster.h
- include\sdetype.h
- lib\libedgemt.so
- lib\libgsrvrdb291.so
- lib\libgsrvrora9i91.so
- lib\libicudt.so.22.0
- lib\libicuuc.so.22.0
- lib\libloceng.so
- lib\liblocssa.so
- lib\libmtchloc.so
- lib\libmtchmt.so
- lib\libpe91.a

- lib\libpe91.so
- lib\libsde91.a
- lib\libsde91.so
- lib\libsdedb2srvr91.so
- lib\libsdeora9isrvr91.so
- lib\libsg91.a
- lib\libsg91.so
- lib\libxerces-c.so.21.0

MySQL Client

Download a Linux x86 non RPM package Standard version (gzipped tarfile) containing the latest production release of MySQL 5.0 from *http://dev.mysql.com/downloads/mysql/5.0.html*. The builds done during the writing of this document used the 5.0.21 version compiled with glibc-2.2.

NOTE The build script uses the FDOMYSQL environment variable to locate the MySQL client headers and libraries. The script expects to find an include and a lib directory in the path value contained in FDOMYSQL. The FDOMYSQL variable is set by the setenvironment.sh script; for more information, read the section entitled "Environment Variables."

ODBC

Download unixODBC-2.2.11-1.i386.rpm and unixODBC-devel-2.2.11-1.i386.rpm from *http://sourceforge.net/project/showfiles.php?group_id=1544*. For more information about this software, go to *http://www.unixodbc.org*.

Install these 2 packages using the rpm command. The libraries and headers will be installed to /usr/lib and /usr/includerespectively.

NOTE The build script uses the FDOODBC environment variable to locate the ODBC headers and libraries. The script expects to find an include and a lib directory in the path value contained in FDOODBC. The FDOODBC variable is set by the setenvironment.sh script; for more information, read the section entitled "Environment Variables."

Disk Space

Summary

The worse case requirement for build and install disk space occurs if you build both the debug and release versions and install the debug version. In this case you require 2 GB of disk space. This requirement is exclusive of the disk space required for the Subversion client including dependencies (6.1 MB), the build tools (12 MB) and the ArcSDE and MySQL provider clients and ODBC driver (115MB). The final total is 2.13 GB.

Environment Variables

Use the setenvironment.sh script in the build directory to set the environment variables before commencing the build. The script assigns default values to most of these variables as noted below and tests for the existence of the directories. If the script detects that a directory does not exist, it will request that you modify the script. The default locations for the MySQL and ArcSDE clients are inside the build directory hierarchy. If you are getting fresh versions of the Fdo software as gzipped tarfiles, you may want to locate the client software outside of the build directory hierarchy; in this case you will want to change the default values of FDOMYSQL and SDEHOME.

NOTE Source the script (`. ./setenvironment.sh`), so that the environment variables are set in the parent shell.

NOTE Add the following line to the setenvironment.sh script before running it: `export FDOODBC=<directory>` where <directory> is the location of the lib and include directories for the ODBC Driver Manager.

- FDO (default is $PWD/Fdo)
- FDOMYSQL (default is $FDOTHIRDPARTY/mysql/rhlinux)

- FDOTHIRDPARTY (default is $PWD/Thirdparty)
- FDOUTILITIES (default is $PWD/Utilities)
- SDEHOME (default is $FDOTHIRDPARTY/ESRI/ArcSDEClient91/Linux)
- FDOODBC
- LD_LIBRARY_PATH

Building Feature Data Objects

Build Order

Build the thirdparty components first. Optionally generate the FDO filter and expression language grammar source files. Build the FDO and utility components. Finally build the providers.

Run the Build_thirdparty.bat Script

The assumption is that you are not changing the third-party software. So these binaries need only be built once. If you notice a third-party component has been updated during a run of checkoutsvn.sh, you must run this script again.

Optionally Run the Build_parse.sh Script

The FDO build uses several source (.cpp and .h) files generated from .y files by the Bison and Sed utilities. These .y files define a grammar for the FDO expression and filter language. If you change the .y files, you must run the build_parse.sh script to regenerate the source files.

Run the Build_linux.sh Script

In a terminal window enter `cd /home/OpenSource` and then enter `build --h`. The build help text is contained in the following list:

- build_linux.sh [--h] [--c BuildType] [--a Action] [--w WithModule] [--d BuildDocs] [--m ConfigMakefiles]
- Help: --h[elp]
- BuildType: --c[onfig] release(default), debug
- Action: --a[ction] buildinstall(default), build, install, uninstall, clean
- ConfigMakefiles: --m[akefile] configure (default), noconfigure
- WithModule: --w[ith] all (default), fdocore, fdo, thirdparty, utilities, providers, shp, sdf, wfs, wms, arcsde, rdbms
- BuildDocs: --d[ocs] skip(default), build

NOTE The `--a configure` clause triggers the processing of the configure.in and makefile.am files to create the configure and makefile scripts followed by a configure, make and make install. The `--a buildinstall` clause triggers a make followed by a make install.

Configure, build and install all of the component binaries and the API documentation using the command `./build_linux.sh --d build`

Configure and remove the intermediate files produced during the last build using the command `./build_linux.sh –a clean`

Configure and uninstall the current distribution, leaving the documentation intact, using the command `./build_linux.sh –a uninstall`

Configure, build and install the debug binaries using the command `./build_linux.sh –c debug`

Configure and build the release binaries component by component using the following commands.

- `./build_linux.sh --a build --w thirdparty`
- `./build_linux.sh --a build --w fdo --m noconfigure`
- `./build_linux.sh --a build --w utilities --m noconfigure`
- `./build_linux.sh --a build --w arcsde`

- `./build_linux.sh --a build --w sdf`
- `./build_linux.sh --a build --w shp`
- `./build_linux.sh --a build --w wfs`
- `./build_linux.sh --a build --w wms`
- `./build_linux.sh --a build --w rdbms`

NOTE The build of the third party components triggers a configure for all of the components, thirdparty, fdo, utilities, and providers. The noconfigure argument is used with the makefile option to suppress a repeat configure operation during the build of the fdo and utilities components.

Build and install the API documentation and install the release binaries using the following commands.

- `./build_linux.sh --a install --w thirdparty`
- `./build_linux.sh --a install --w fdo --d build`
- `./build_linux.sh --a install --w providers --d build`

NOTE There is no documentation built for the third party components.

Remove intermediate files from the build directories and uninstall the binaries and include files from the output directories using the following commands.

- `./build_linux.sh --a clean --w thirdparty`
- `./build_linux.sh --a clean --w fdo`
- `./build_linux.sh --a clean --w utilities`
- `./build_linux.sh --a clean --w providers`
- `./build_linux.sh --a uninstall --w thirdparty`
- `./build_linux.sh --a uninstall --w fdo`
- `./build_linux.sh --a uninstall --w providers`
- `./build_linux.sh --a uninstall --w utilities`

NOTE The uninstall commands do not delete the API documentation in the docs directory.

Configure, build, and install the debug binaries using the following commands.

- `./build_linux.sh --c debug --w thirdparty`
- `./build_linux.sh --c debug --m noconfigure --w fdo`
- `./build_linux.sh --c debug --m noconfigure --w utilities`
- `./build_linux.sh --c debug --w providers`

Build Outputs

Install Directory

The following table shows the contents of the install directories after building the various components. The root install directory is /usr/local/fdo-x.x.x where *x.x.x* is a version number.

NOTE The FDO open source distribution contains a providers.xml file. This file is used by FDO to identify where FDO provider binaries are installed. During the install process this file is copied from the build directory to the directory containing libFDO-3.2.0.so file.

Target	lib	include	nls	Docs	docs/HTML
Third-party	libcrypto.so.0.9.7, libgdal.so.1.9.0, libxalan-c.so.17.0, libxerces-c.so.25.0, libcurl.so.3.0.0, libssl.so.0.9.7, libxalanMsg.so.17.0				
Fdo	libFDO-3.2.0.so	Common/, Fdo/, Geometry/, Common.h, Fdo.h, Geometry.h, Message.h, and Std.h	FDOMessage.cat	XMLSchema/	FDO_API/

Target	lib	include	nls	Docs	docs/HTML
Utilities	libFdoOws-3.2.0.so				
ArcSDE	libArcSDEProvider-3.2.0.so		ArcSDEMessage.cat		Providers/ArcSDE
MySQL	Com/, libFdoMySQL-3.2.0.so, libSchemaMgr_OV-3.2.0.so	Rdbms/	fdordbmsmsg.cat		Providers/MySQL
ODBC	libFdoODBC-3.2.0.so, libSchemaMgr_OV-3.2.0.so	Rdbms/	fdordbmsmsg.cat		Providers/ODBC
SDF	libSDFProvider-3.2.0.so	SDF/	SDFMessage.cat		Providers/SDF
SHP	libSHPOverrides-3.2.0.so, libSHPProvider-3.2.0.so	SHP/	ShpMessage.cat		Providers/SHP
WFS	libWFSProvider-3.2.0.so		WFSMessage.cat		Providers/WFS
WMS	libWMSOverrides-3.2.0.so, libWMSProvider-3.2.0.so	WMS/	FdoWmsMessage.cat		Providers/WMS

Unit Tests

Introduction

Unit test executables for the Fdo core components and the SDF and SHP providers are generated during the build of the debug version .

The generated unit test executables (UnitTest.exe) are located as follows:

- /home/OpenSource/Fdo/UnitTest
- /home/OpenSource/Providers/SDF/Src/UnitTest
- /home/OpenSource/Providers/SHP/Src/UnitTest

The test data for the SDF and SHP providers is located as follows:

- /home/OpenSource/Providers/SDF/TestData
- /home/OpenSource/Providers/SHP/TestData

NOTE The SHP and SDF unit tests use relative paths to locate the test data.

Run the FDO Unit Tests

Do the following in a terminal window:

1. `cd /home/OpenSource/Fdo/UnitTest`
2. `./UnitTest`

The last line of output from these tests should be OK (<number>)

Run the SDF Unit Tests

Do the following in a cmd.exe window:

1. `cd /home/OpenSource/Providers/SDF/Src/UnitTest`
2. `./UnitTest`

The last line of output from these tests should be OK (<number>)

Run the SHP Unit Tests

Do the following in a cmd.exe window:

1. `cd /home/OpenSource/Providers/SHP/UnitTest`

2

```
./UnitTest
```

The last line of output from these tests should be OK (<number>)

Supporting Information

Disk Space Calculation

Repository Tool

The disk space requirement for the Subversion client is 6.1 MB.

Build Tools

The following table shows the disk space requirements prior for the build tools.

Tool	Disk Space (MB)
bison 1.875	0.6
sed 4.07.3	0.3
doxygen 1.3.5	4.3
graphviz 2.8.	4.8
autoconf 2.57	1.6
automake 1.5	0.9
make 3.79.1	0.5
Total	12.0

NOTE autoconf and automake are run if any Makefile.am or configure.in file is modified.

Provider Client Dependencies

The following table shows the disk space requirements prior for the thirdparty provider client components.

Client	Disk Space (MB)
ArcSDE 9.1	52.8
MySQL 5.0	60
unixODBC	2.0
Total	114.8

Pre-build Build Folder

The following table shows the inital disk space requirements prior to commencement of the build.

Folder	Disk Space (MB)
Fdo	46.3
Providers	405
Thirdparty	461
Utilities	16.1
Total	928

Post-build Build Folder

The following table shows the final disk space requirements for the build folder after completion of the release and debug builds.

Folder	Size (MB)
Thirdparty after building release version	627
Fdo after building release version	174
Providers after building release version	610
Utilities after building release version	61
Total after building release version	1472
Thirdparty folder size after building release and debug versions	628
Fdo folder size after building release and debug versions	204
Providers folder size after building release and debug versions	817
Utilities folder size after building release and debug versions	106
Total after building release and debug versions	1755

Install Folder

The following table shows the disk space requirements in Megabytes for the install folder after completion of the release build and install.

Folder	Third-party	FDO	Pro-viders	Utilities	Total
Fdo/lib	15.1	4.0	34.3	2.5	55.9

Folder	Third-party	FDO	Providers	Utilities	Total
Fdo/include	0	9.2	0.4	0	9.6
Fdo/nls	0	0.0	0.1	0	0.1
Fdo/Docs	0	0.7	0	0	0.7
Fdo/docs	0	92.0	15.0	0	107.0
Total	15.1	106.0	49.7	2.5	173.3

NOTE The total size of the Fdo/Docs folder includes the HTML folder shared by the FDO and Providers .chm files.

The following table shows the disk space requirements for the install folder after completion of the debug build and install.

Folder	Third-party	FDO	Providers	Utilities	Total
Fdo/lib	15	10	90.8	8.2	124
Fdo/include	0	9.2	0.4	0	9.6
Fdo/Nns	0	0.0	0.1	0	0.1
Fdo/Docs	0	0.7		0	0.7
Fdo/docs	0	92	15	0	107.0
Total	15	111.9	106.3	8.2	241.4

Build Components

build_linux.sh, configure.in, and makefile.am Files

The name of the master FDO open source build script is build_linux.sh, and it is located in the build directory (/home/OpenSource.

The configure.in file identifies the location of all of the makefile.am files in the distribution. When given the configure argument to the action option the build_linux.sh converts the makefile.am files into makefiles.

Build Outputs

The following table maps Makefile files to output files. The '...' in the path names represents /home/OpenSource.

Makefile	Output Files
.../Thirdparty/apache/xml-xerces/c/src/xercesc	libxerces-c.so.25.0
.../Thirdparty/apache/xml-xalan/c/	libxalan-c.so.17.0, libxalanMsg.so.17.0
.../Thirdparty/libcurl/lib	libcurl.so.3.0.0
.../Thirdparty/openssl	libssl.so.0.9.7
.../Thirdparty/openssl/crypto	libcrypto.so.0.9.7
.../Thirdparty/GDAL1.3/src/port	libgdal.so.1.9.0
.../Fdo/Test	UnitTest
.../Fdo/Unmanaged/Src	libFDO-3.2.0.so
.../Fdo/Unmanaged/Src/Message	FDOMessage.cat

Makefile	Output Files
.../Utilities/OWS	libFdoOws-3.2.0.so
.../Utilities/SchemaMgr/Nls	SmMessage.cat
.../Providers/ArcSDE/Src	libArcSDEProvider-3.2.0.so
../Providers/ArcSDE/Src/Message	ArcSDEMessage.cat
.../Providers/GenericRdbms/Nls	fdordbmsmsg.cat
.../Providers/GenericRdbms/Src	libFdoMySQL-3.2.0.so
.../Providers/GenericRdbms/Src	libFdoODBC-3.2.0.so
.../Providers/GenericRdbms/Src	libSchemaMgr_OV-3.2.0.so
.../Providers/SDF/Src	libSDFProvider-3.2.0.so
../Providers/SDF/Src/Message	SDFMessage.cat
../Providers/SDF/Src/UnitTest	UnitTest
.../Providers/SHP/Src/Overrides	libSHPOverrides-3.2.0.so
.../Providers/SHP/Src/Provider	libSHPProvider-3.2.0.so
../Providers/SHP/Src/Message	ShpMessage.cat
../Providers/SHP/Src/UnitTest	UnitTest
.../Providers/WFS/Src/Provider	libWFSProvider-3.2.0.so
.../Providers/WFS/Src/Message	WFSMessage.cat
.../Providers/WMS/Src/Overrides	libWMSOverrides-3.2.0.so

Makefile	Output Files
…/Providers/WMS/Src/Provider	libWMSProvider-3.2.0.so
../Providers/WMS/Src/Message	FdoWmsMessage.cat