sedna.org

Sedna Installation Guide

15–19 minutes

This document describes installation of the Sedna XML Database. See also Quick Start if you need the fastest way to understand basic facilities of the Sedna XML Database.

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Installation from Binaries

Windows

Sedna is distributed as a single `tar.gz` archive which contains everything you need to run Sedna.

The installation process consists of the following steps:

- Extract archive (for example with 7-Zip) to any directory. **Note:** path should not contain non-ASCII symbols.
- **Optional:** add the bin subdirectory of Sedna installation to the environment variable PATH.
- Refer to the Sedna Quick Start or to the Sedna Documentation site for the details on how to run and use Sedna XML Database.

Linux, FreeBSD, Mac OS X, Solaris

Sedna is distributed as a single self-extracting script. The installation process consists of running self-extracting script and following its

instruction:

chmod +x sedna-xxx-bin-xxx.sh

./sedna-xxx-bin-xxx.sh

The operating system user that is going to run Sedna must have `r–w–x` permissions for the following Sedna directories:

$SEDNA_INSTALL/data

$SEDNA_INSTALL/cfg

To grant the necessary permissions to the user on Linux/FreeBSD/Mac OS you can use the following command (suppose, `<sedna–user>` is the user that is going to run Sedna):

chown <sedna-user> cfg data

You may need to perform additional post installation steps depending on your requirements and OS you run Sedna on. Please check Post-Installation Setup section for further details.

Refer to the Sedna Quick Start or to the Sedna Documentation site for the

details on how to run and use Sedna XML Database.

Quick Build How-To

- Install CMake 2.6 or higher. Refer also to the documentation of your OS distribution for the details on how to install CMake.
- Download and extract Sedna sources distribution for your platform from the Sedna Download page. Here and after we suppose that `SEDNA_SOURCE` is path of the extracted Sedna sources.
- Run the following commands to build and install Sedna.
  `CMAKE_INSTALL_PREFIX` defines full path to the Sedna binaries tree to be installed. It's recommended to install all Sedna files into one separate folder. For example:
  -DCMAKE_INSTALL_PREFIX=/usr/local/sedna

  will install Sedna binaries tree into `/usr/local/sedna`. **Note:** path should not contain non-ASCII symbols.

[On Unix]:

cd SEDNA_SOURCES

mkdir bld

cd bld

cmake .. -DCMAKE_INSTALL_PREFIX=<Install-Path>

make

make install

Note: some platforms provide gmake command instead of make by default.

[On Windows]:

<Run Visual Studio Command Prompt>

cd SEDNA_SOURCES

mkdir bld

cd bld

cmake .. -G"NMake Makefiles" -DCMAKE_INSTALL_PREFIX=<Install-Path>

nmake
nmake install

- Run `make sedna_library` on Unix-like OS and `nmake sedna_library` on Windows if you need only Sedna library.
- **Important:** you may need to perform additional post installation steps depending on your requirements and OS you run Sedna on. Please check Post-Installation Setup section for further details.
- The operating system user that is going to run Sedna must have `r–w–x` permissions for the following Sedna directories:
  <Install-Path>/data
  <Install-Path>/cfg

Complete Build How-To

Prerequisites

Sedna is being tested on x86, amd64 (x64/x86_64) and PPC architectures. It's expected to build and run on the following platforms:

1. Microsoft Windows 2000 and higher
2. Linux (kernel 2.6 and higher)
3. Mac OS X
4. FreeBSD
5. Solaris

To build Sedna from sources you need to download and extract sources package for your platform from the Sedna Download page. On Windows you can use 7-Zip to extract sources package. Here and after we suppose that `SEDNA_SOURCE` is path of the extracted Sedna sources.

The following software packages are required for building Sedna:

- **[Required]** CMake 2.6 and higher. See the How to Install CMake section below for the details on how to obtain CMake for your platform.

- **[Required]** C/C++ compiler.

  Windows: CL version 12.00.xxxx (Visual C++ 6.0) or higher is required.

  You can install free Express version of Visual Studio to build Sedna on Windows

  Unix or Linux: GCC version 3.x.x or higher is required.

- **[Optional]** For building Java API driver you need Sun JDK version 1.4 or higher.

  How to Install CMake

  The latest version is available from the CMake download page.

  For Windows and Mac OS X just download installer from the CMake download page and run it.

  On most Unix-like platforms it's also available via package distribution systems:

- Debian/Ubuntu Linux:

sudo apt-get install cmake cmake-gui

- Fedora Linux:
  sudo yum install cmake cmake-gui
- openSUSE Linux:
  sudo zypper install cmake cmake-gui
- FreeBSD, either:
  pkg_add -r cmake
  using sysinstall utility
  using ports collection

  Alternatively, you can build CMake from sources, a source package is also available from the CMake download page.

  Command Line Configuration

- Ensure that compiler and CMake are in PATH:
  [Hint] On Windows Run Visual Studio Command Prompt or Visual Studio

x64 Command Prompt if you want to build x64 binaries.

- One of the nice CMake features is "out-of-source" build support, which means not building in the source directory, but in dedicated build directory. This keeps the source directory clean and allows for more than single build tree for the same source tree (e.g. debug and release, 32 and 64 bit etc). We'll create subdirectory "bld" in the source directory for this purpose:
  cd SEDNA_SOURCES
  mkdir bld
  cd bld

- Run initial configuration:
  cmake ..

  By default CMake will create make files on Unix-like platforms (Linux, FreeBSD, Solaris Mac OS X) and Visual Studio x32 project on Windows. If you want to use another generator use -G option. For example:

cmake .. -G "NMake Makefiles"

command will generate nmake makefiles on Windows which can be then build with nmake command line utility.
cmake .. -G"Visual Studio 9 2008 Win64"

command will generate Visual Studio 2008 x64 project.

- **[Optional]** Adjust configuration parameters. To list configuration parameters run:
  cmake . -LH

  To list advanced configuration parameters run:
  cmake . -LAH

  To change parameter value just run something like:
  cmake . -DSQL_CONNECTION=ON

  Frequently used parameters include:
- **`CMAKE_BUILD_TYPE`** - use `Debug` value to build binaries with debug information and turned off optimizations. Default valaue `Release`.

- **`CMAKE_INSTALL_PREFIX`** - defines full path to the Sedna binaries tree to be installed. It's recommended to install all Sedna files into one separate folder. For example: `–DCMAKE_INSTALL_PREFIX=/usr/local/sedna` will install Sedna binaries tree into `/usr/local/sedna`. Path should not contain non-ASCII symbols.
- **`EL_DEBUG`** - Set value to ON if you want to turn on all Sedna debug printings.
- **`SQL_CONNECTION`** - Adds support to SQL Connections. Set value to ON if you want SQL Connection facility to be enabled. On Unix-like systems, you may need to install ODBC development package (usually unixODBC-devel) to build Sedna with SQL Connection facility enabled.
- **`STATIC_SYS_LIBS`** - Links Sedna executables with static system libraries. Set value to ON if you want to link Sedna executables with static system libraries.
- **`ENHANCE_TERM`** - Possible values `Readline`, `Libedit`, `None`. Default

value on Unix-like OS is `Libedit`. On Windows - `None`, other options are ignored on Windows.
Libedit (or readline itself) greatly increases the usability of se_term - command line terminal for Sedna. It adds all of the standard functionality of the GNU Readline library to the se_term command line, such as being able to easily modify, edit, and retrieve command-history information with the arrow keys.

Note, you may need to install either libtermcap, libcurses or libncurses package (depending on exact OS type) to build Sedna with libedit or readline support. In some cases (e.g. Debian, Ubuntu) you have to install libtermcap, libcurses or libncurses development package as well. Also you may need to install readline development headers on some platforms to build with 'Readline' option.

Note, you can't use `Readline` option with `STATIC_SYS_LIBS` enabled.

- **`JAVA_DRIVER`** - Compiles Java driver. Set value to `OFF` if you don't need

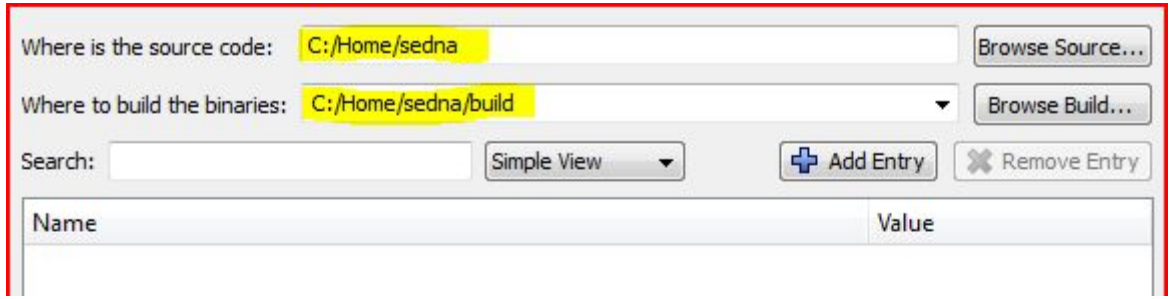
java driver. If want to build java driver make sure that you have java compiler in path.

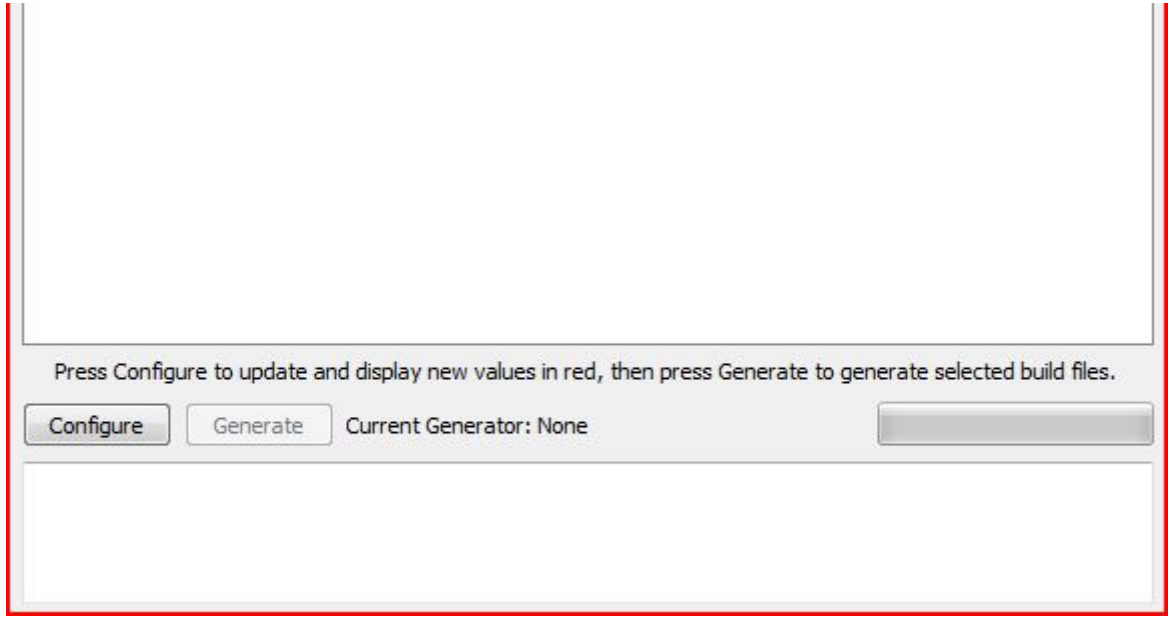
- **`ENABLE_TRIGGERS`** - Turns on support for triggers (default). Set value to `OFF` if you would like to turn support for triggers off.

Configuration with CMake-GUI

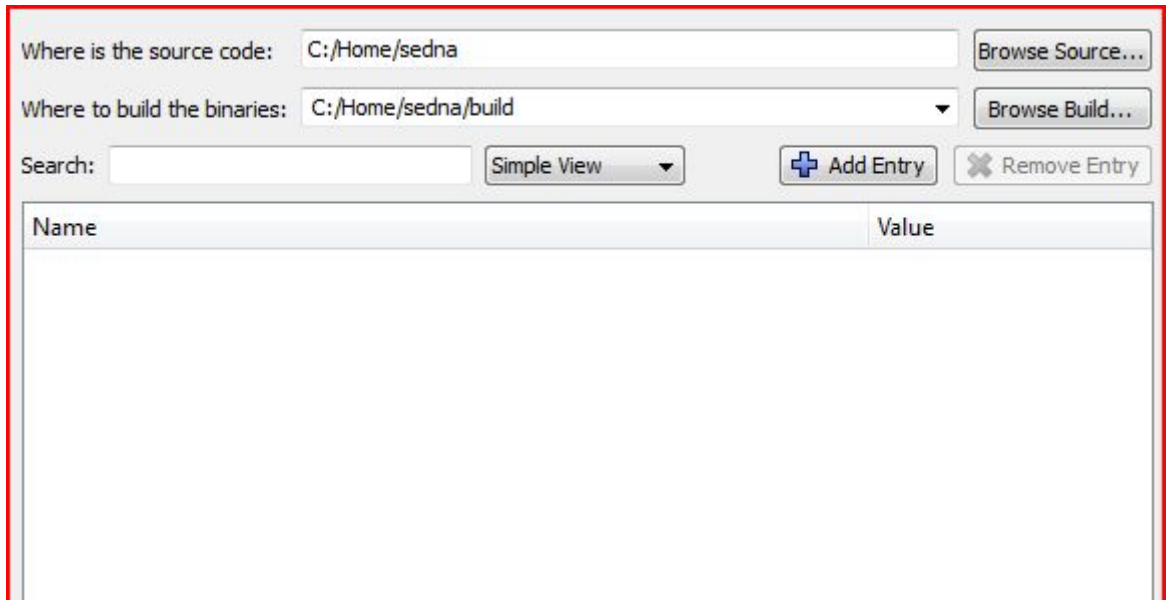
If you have `cmake-gui` installed you can choose generator and adjust configuration with it:

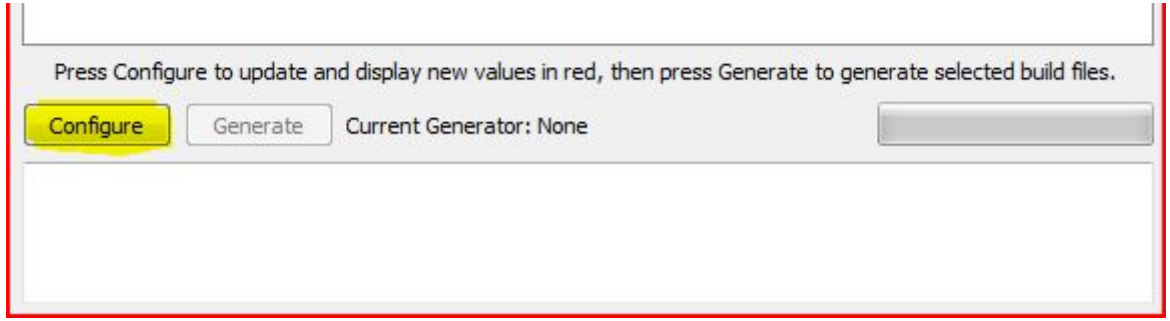
- Run `cmake-gui`:
  cd SEDNA_SOURCES
  cmake-gui .
- Set location to the source code and where to build binaries.

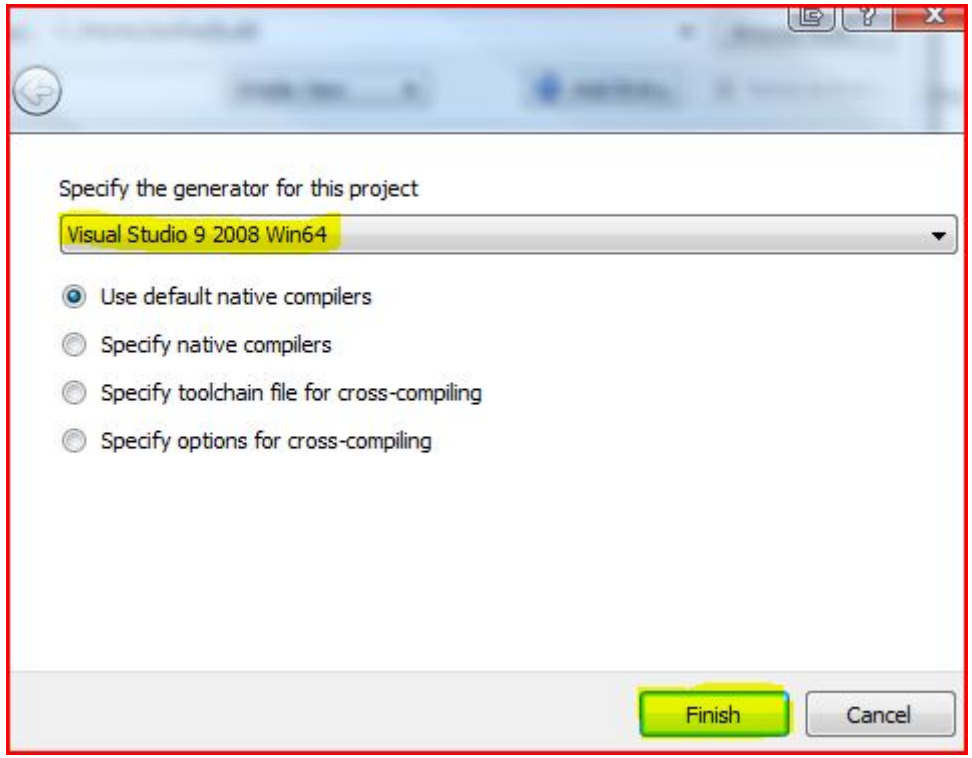




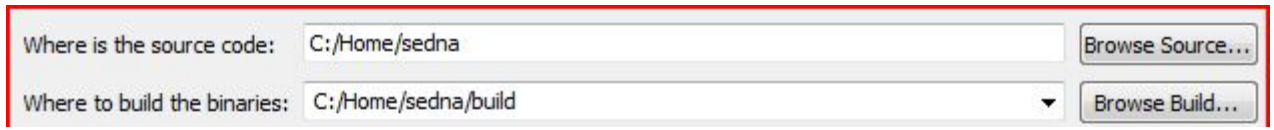
- Run Configure to perform initial configuration and select generator you want to use.

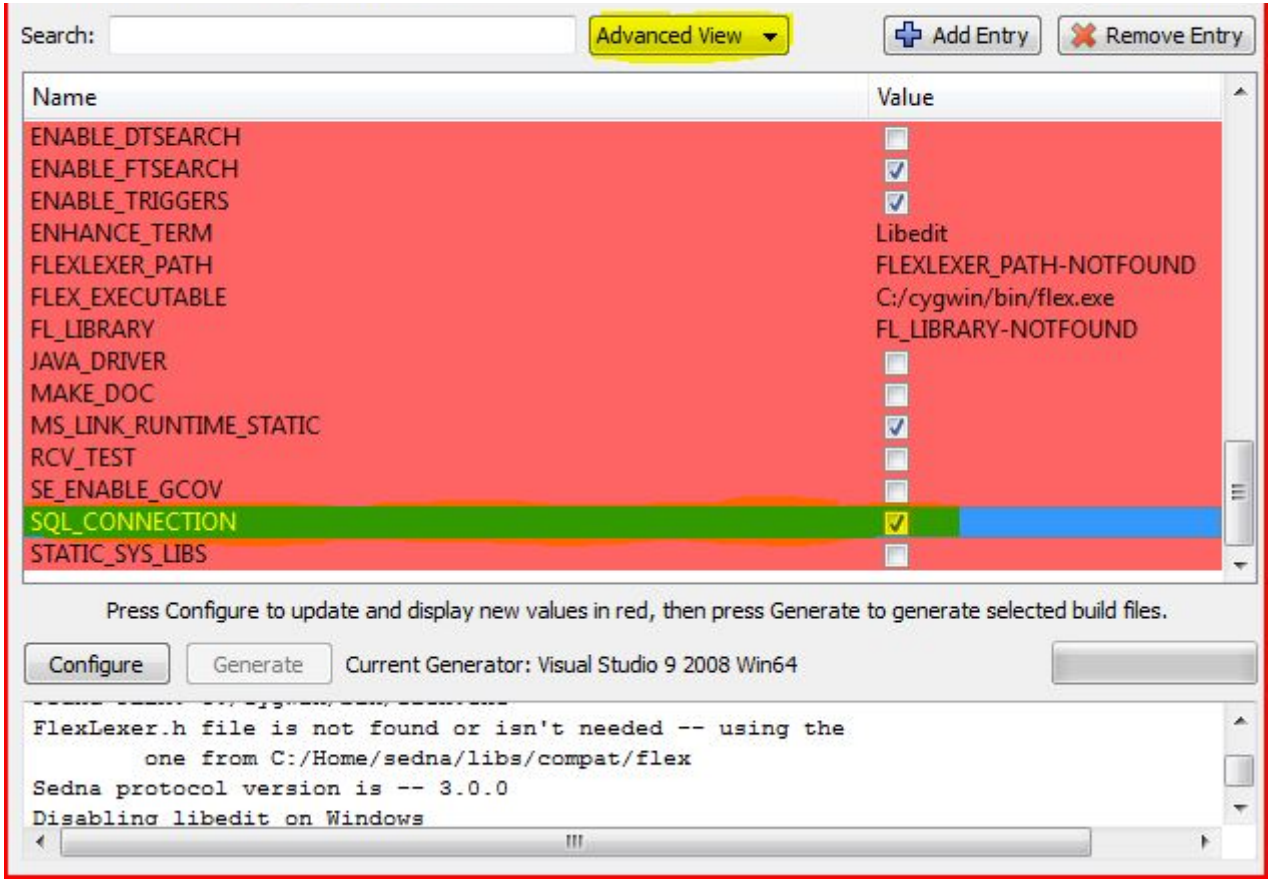






- Adjust parameters you need. You can also set advanced parameters with 'Advanced View' checkbox.





- Run Configure again to apply changes.
- Run Generate to generate makefiles (or Visual Studio project) to build Sedna.

Build and Install

If you need to build only C-driver (libsedna) refer to the Build C-driver section.

- Note, it's recommended to install all Sedna files into one separate folder. For example, use `–DCMAKE_INSTALL_PREFIX=/usr/local/sedna` configuration parameter to install Sedna binaries tree into `/usr/local/sedna`. Path should not contain non-ASCII symbols.
- You may need to perform additional post installation steps depending on your requirements and OS you run Sedna on. Please check Post-Installation Setup section for further details.
- The operating system user that is going to run Sedna must have `r–w–x` permissions for the following Sedna directories:
  <Install-Path>/data
  <Install-Path>/cfg
- To build and install Sedna:
  [Unix] (Linux, Mac OS, FreeBSD, Solaris, etc)

On Unix-like OS just run make command in the directory selected for Sedna binaries in the previous step:

make

Note, on some platforms `gmake` command is available by default instead. In this case here and after we suppose that `gmake` can be used everywhere `make` is used.

If you want to see how compiler is invoked use verbose mode:

make VERBOSE=1

To install Sedna into directory defined by `CMAKE_INSTALL_PREFIX` run:
make install

[Windows]

The way to build Sedna depends on the generator you've chosen.

If *'NMake Makefiles'* generator was used then just run `nmake` command in the directory selected for Sedna binaries in the previous step:

nmake

To install Sedna into directory defined by `CMAKE_INSTALL_PREFIX` run:

nmake install

If *'Visual Studio XXXX'* generator was used then:

- Run Visual Studio XXXX;
- Open solution file (it's located in path selected for Sedna binaries in the previous step).
- Select build type (Release, Debug, etc) you want.
- Run `Build -> Build Solution` command to build Sedna.

  To install Sedna into directory defined by `CMAKE_INSTALL_PREFIX` just build `INSTALL` project.

  Build C-driver (libsedna)

  For some languages drivers (PHP, Python, etc) you need just libsedna

driver. In this case you can use target `sedna_library` (`sedna_library` project in Visual Studio solution) to build only Sedna library. Run in the directory specified in the initial configuration for Sedna binaries:

[Unix]
make sedna_library

[Windows]
nmake sedna_library
(or run 'Build' command on the sedna_library project if Visual Studio solution is used)

Dynamic and static versions of Sedna library will be placed into:

<Sedna-Binaries-Path>/driver/c

Visual Studio places them into:
<Sedna-Binaries-Path>/driver/c/<Build-Type>

where <Build-Type> can be Release, Debug, etc.

Advanced Topics

- If you want to specify your own compiler flags, set environent variables `CFLAGS`, `CXXFLAG`.
- If you want to control which compiler is chosen, set `CC` and `CXX` environment variables to point to C and C++ compilers.
- You can use `CC` and `CXX` variables to add global compiler flags. It's quite convenient if you want to change target architecture. For example, to build x64 version of Sedna on Solaris, run:
  CC="gcc -m64"
  CXX="g++ -m64"
  export CC
  export CXX

  before the configuration step.

Installation From Git Repository

Sedna development version is available in the Git repository:

git clone git://modis.ispras.ru/sedna

To build repository version of Sedna you must install `flex` (>2.5.35) and `bison` (>2.3). If you want to build documentation you'll also need TeX processing environmnet which includes `pdflatex` utility.

To build and install Sedna tree follow the same instructions as in the Sources Complete Build How-To section above. For convenience, a configuration script for developers (`configure.sh`) is provided. It includes most frequently used Sedna configuration parameters:

sedna/configure.sh

Post-Installation Setup

FreeBSD

To run Sedna on FreeBSD you may need to perform the following

additional post-installation steps:

1. Unfortunately FreeBSD (7.0, 6.3 and earlier) has a bug in System V semaphores. To run Sedna you have to rebuild your kernel with the patch you can get at the problem report page.
2. Increase system IPC configuration either using sysctl utility or through `/boot/loader.conf`. Below possible values are listed:
   kern.ipc.semmnu=256
   kern.ipc.semmns=512
   kern.ipc.semmni=256
   kern.ipc.semmap=258

   Note: reboot your machine after changing `/boot/loader.conf`.

   Linux

   By default Linux kernel doesn't allow to get as much semaphores as Sedna actually needs to run 50 sessions (default maximum)

simultaneously.

Extend some of the default kernel parameter settings. It is quite simple. For example, here are instructions on how to modify the `kernel.sem` and how to keep them set after a reboot:

Log on as a user with root authority. Open up `/etc/sysctl.conf` in a text editor and add entries:

kernel.sem = "250 64000 32 256"

Last number (`SEMMSL`) means system wide maximum of semaphore sets, first (`SEMMNI`) defines maximum number of semaphores per set, second defines total number of semaphores and usually must be equal `SEMMSL*SEMMNI`.

Note: `se_gov` + `se_sm` processes take apprx. 20 semaphore sets and each `se_trn` (session) process takes 3 semaphores at least.

- Enter the `sysctl -p` command to load in sysctl settings from `/etc/`

`sysctl.conf`.

- Enter the `ipcs -l` to view the updated kernel parameters in sysctl.