

# **Yuma Tools® Installation Guide**

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YANG-Based Unified Modular Automation Tools

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# 1 Preface

## 1.1 Legal Statements

Copyright 2009 - 2010 Netconf Central, Inc., All Rights Reserved.

## 1.2 Restricted Rights Legend

This software is provided with RESTRICTED RIGHTS.

Use, duplication, or disclosure by the U.S. Government is subject to restrictions set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs(c)(1) and (2) of the Commercial Computer Software - Restricted Rights at 48 CFR 52.227-19, as applicable.

The "Manufacturer" for purposes of these regulations is Netconf Central, Inc., 374 Laguna Terrace, Simi Valley, California 93065 U.S.A.

## 1.3 Additional Resources

Depending on the version of Yuma you purchased, other documentation includes:

- Yuma Tools® Quickstart Guide
- Yuma Tools® User Manual
- Yuma Tools® Developer Manual

To obtain additional support you may email InterWorking Labs at the e-mail address  
yuma-support@iwl.com

There are several sources of free information and tools for use with YANG and/or NETCONF.  
The following section lists the resources available at this time.

### 1.3.1 WEB SITES

- **Yuma Tools Home Page**
  - <http://yuma.iwl.com/>
  - Official home page for Yuma Tools information
- **Netconf Central**
  - <http://www.netconfcentral.org/>
  - Free information on NETCONF and YANG, tutorials, on-line YANG module validation and documentation database
- **Yang Central**
  - <http://www.yang-central.org>
  - Free information and tutorials on YANG, free YANG tools for download

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- **NETCONF Working Group Wiki Page**
  - <http://trac.tools.ietf.org/wg/netconf/trac/wiki>
  - Free information on NETCONF standardization activities and NETCONF implementations
- **NETCONF WG Status Page**
  - <http://tools.ietf.org/wg/netconf/>
  - IETF Internet draft status for NETCONF documents
- **libsmi Home Page**
  - <http://www.ibr.cs.tu-bs.de/projects/libsmi/>
  - Free tools such as smidump, to convert SMIv2 to YANG

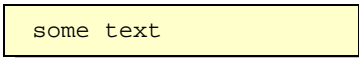
### 1.3.2 MAILING LISTS

- **NETCONF Working Group**
  - <http://www.ietf.org/html.charters/netconf-charter.html>
  - Technical issues related to the NETCONF protocol are discussed on the NETCONF WG mailing list. Refer to the instructions on the WEB page for joining the mailing list.
- **NETMOD Working Group**
  - <http://www.ietf.org/html.charters/netmod-charter.html>
  - Technical issues related to the YANG language and YANG data types are discussed on the NETMOD WG mailing list. Refer to the instructions on the WEB page for joining the mailing list.

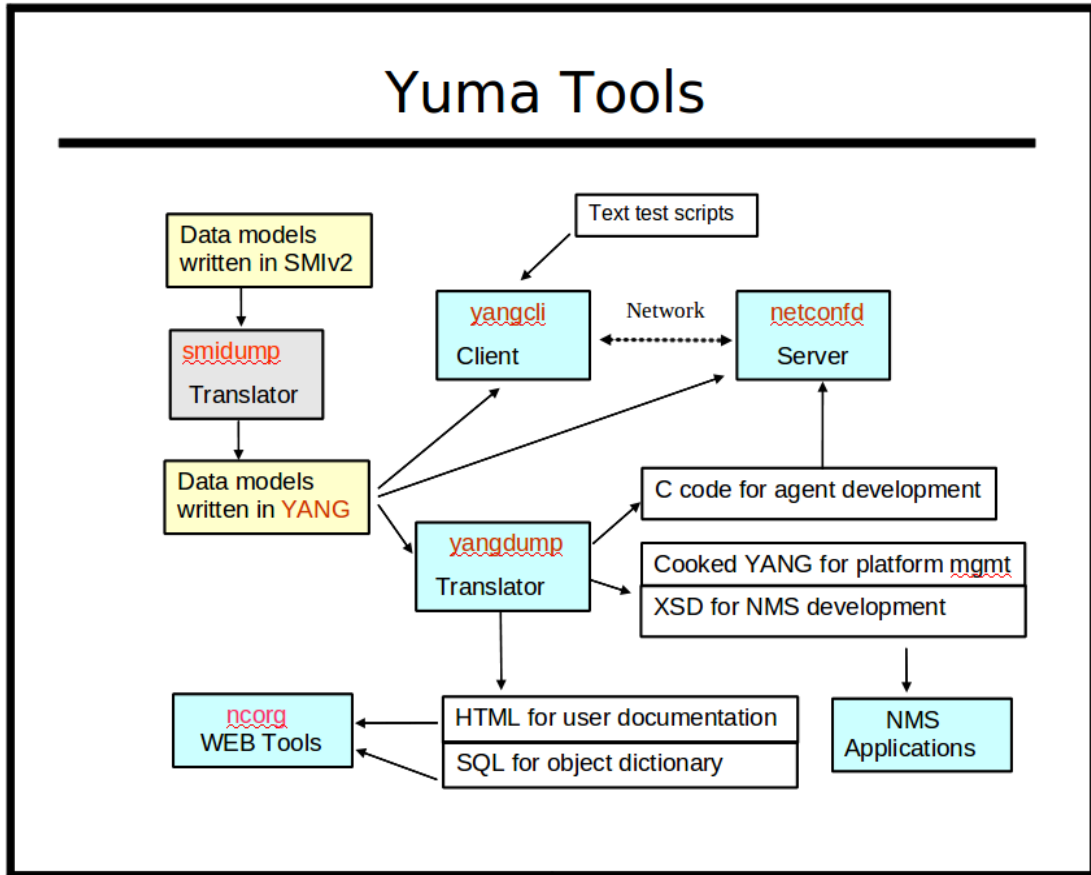
## 1.4 Conventions Used in this Document

The following formatting conventions are used throughout this document:

### Documentation Conventions

Convention	Description
<b>--foo</b>	CLI parameter foo
<b>&lt;foo&gt;</b>	XML parameter foo
<b>foo</b>	<b>yangcli</b> command or parameter
<b>\$\$FOO</b>	Environment variable FOO
<b>\$\$foo</b>	<b>yangcli</b> global variable foo
	Example command or PDU
some text	Plain text

## 2 Introduction



Refer to section 3 of the Yuma User Manual for a complete introduction to Yuma Tools. This section focuses on the client and server tools within the Yuma Tools programs.

### 2.1 Intended Audience

This document is intended for users of the Yuma Tools NETCONF client and server programs. It covers the installation of the Yuma Tools packages.

### 2.2 Yuma Packages

The Yuma Tools programs are divided into several packages, depending on the version of Yuma Tools that was purchased:

- **yuma-shlibs:** Contains the libncx shared library used by all Yuma Tools programs
- **yuma-client:** Includes the NETCONF client program, and programs to process YANG files
- **yuma-server:** Includes the NETCONF server programs

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- **yuma-dev**: Includes tools, make files, and header files needed for a developer to create server instrumentation libraries for use with the yuma-server package
- **yuma-sdk**: Includes the complete Yuma Tools source code, and tools for customizing the NETCONF server for use in embedded operating systems

## 3 Installation Requirements

The following requirements must be met for Yuma Tools to be installed.

### 3.1 Supported Platforms

The following platforms are supported at this time for the Yuma binary packages:

- Ubuntu version 9.10 (32 bit x86 and 64-bit AMD)
- Fedora version 12 (32 bit x86)

The **yuma-sdk** package contains source code which can be built on many other platforms that support the Gnu C compiler.

### 3.2 External Packages

The following programs and libraries need to be available for Yuma Tools to work.

#### 3.2.1 LIBXML2

The libxml2 package is needed by the yuma-shlibs package for some of the XML parsing tasks.

#### 3.2.2 LIBSSH2

The libssh2 package is need by the yuma-client package for client-side SSH protocol support.

#### 3.2.3 NCURSES

The curses library is needed by the yuma-client package for some terminal support.

#### 3.2.4 LIBSSL

The SSL library is needed by libssh2 package to process the SSH protocol.

## 4 Quick Installation

This section describes how to use the platform package manager program to install the Yuma Tools programs.

### 4.1 Ubuntu

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First, make sure the external libraries are installed.

```
mydir> sudo apt-get install libxml2 libssh2 ncurses
```

Next, install the Yuma Tools shared libraries. Here is an example.

The actual yuma-shlibs revision and hardware platform may be different:

```
mydir> sudo dpkg -i yuma-shlibs_0.11-2_amd64.deb
```

After the shared libraries are installed, then the yuma-client and/or yuma-server packages can be installed:

```
mydir> sudo dpkg -i yuma-client_0.11-2_amd64.deb
```

```
mydir> sudo dpkg -i yuma-server_0.11-2_amd64.deb
```

## 4.2 Fedora

First, make sure the external libraries are installed.

```
mydir> sudo yum install libxml2 libssh2 ncurses
```

Next, install the Yuma Tools shared libraries. Here is an example.

The actual yuma-shlibs revision and hardware platform may be different:

```
mydir> sudo yum localinstall yuma-shlibs_0.11-2_amd64.deb
```

After the shared libraries are installed, then the yuma-client and/or yuma-server packages can be installed:

```
mydir> sudo yum localinstall yuma-client_0.11-2_amd64.deb
```

```
mydir> sudo yum localinstall yuma-server_0.11-2_amd64.deb
```

## 5 Installed Files

This section describes all the files and/or directories installed by Yuma Tools.

### 5.1 yuma-shlibs Package

The Yuma shared libraries package installs the following components:

- **/usr/lib** directory contains 1 shared library and a symbolic link:
  - /usr/lib/libncx.so.1.0
  - /usr/lib/libncx.so
- **/usr/share/doc/yuma** directory containing the following files:
  - AUTHORS
  - yumatools-legal-notices.pdf
  - README
  - ChangeLog
  - yumatools-cs-license.pdf
- **/usr/share/doc/yuma-shlibs** directory (Ubuntu only) containing the following files:
  - copyright
  - changelog.Debian
- **/usr/share/yuma/modules** directory contains all the core YANG modules:
  - ietf/
  - netconfcentral/
  - yang/
  - test/

### 5.2 yuma-client Package

The Yuma client applications package installs the following components:

- **/usr/bin** directory contains the following programs:
  - yangcli
  - yangdiff
  - yangdump
- **/usr/share/man/man1** directory contains the following files:
  - yangcli.1.gz
  - yangdiff.1.gz
  - yangdump.1.gz
- **/usr/share/yuma/modules/netconfcentral** directory contains the following YANG modules:
  - yangcli.yang
  - yangdiff.yang



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- yangdump.yang
- **/usr/share/doc/yuma** directory contains the following files:
  - yuma-user-manual.pdf
  - yuma-quickstart-guide.pdf
- **/usr/share/doc/yuma-client** directory (Ubuntu only) containing the following files:
  - copyright
  - changelog.Debian
- **/etc/yuma** directory contains the following sample configuration files:
  - yangcli-sample.conf
  - yangdiff-sample.conf
  - yangdump-sample.conf

### 5.3 yuma-server Package

The Yuma server package installs the following components:

- **/usr/lib/yuma** directory contains the following file:
  - libtoaster.so
- **/usr/sbin** directory contains the following server programs:
  - netconfd
  - netconf-subsystem
- **/usr/share/man/man1** directory contains the following files:
  - netconfd.1.gz
  - netconf-subsystem.1.gz
- **/usr/share/yuma/modules/netconfcentral** directory contains the following YANG modules:
  - netconfd.yang
  - yuma-interfaces.yang
  - yuma-mysession.yang
  - yuma-proc.yang
  - yuma-system.yang
- **/usr/share/doc/yuma-server** directory (Ubuntu only) containing the following files:
  - copyright
  - changelog.Debian
- **/etc/yuma** directory contains the following sample configuration file:
  - netconfd-sample.conf

### 5.4 yuma-dev Package

The Yuma developer package installs the following components:

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- **/usr/bin** directory contains the yangdumpcode program to generate source code from YANG modules, and a shell script to start a server code project:
  - make\_sil\_dir.sh
  - yangdumpcode
- **/usr/share/man/man1** directory contains the following file:
  - yangdumpcode.1.gz
- **/usr/share/yuma/src/libtoaster** directory contains the following contents:
  - Makefile
  - src directory
  - bin directory
  - lib directory
- **/usr/share/yuma/util** directory contains the following files:
  - makefile.sil
  - makefile-top.sil
- **/usr/share/doc/yuma** directory contains the following files:
  - yuma-dev-manual.pdf
  - yumatools-dev-license.pdf
- **/usr/share/doc/yuma-dev** directory (Ubuntu only) containing the following files:
  - copyright
  - changelog.Debian
- **/usr/include/yuma** directory contains the following sub-directories, each with a set of H files:
  - platform/
  - ncx/
  - agt/
- **/etc/yuma** directory contains the following sample configuration file:
  - yangdumpcode-sample.conf

## 6 Next Steps

### 6.1 More Documentation

- Yuma Tools Quickstart Guide:
  - **/usr/share/doc/yuma/yumatools-quickstart-guide.pdf**
- Yuma Tools User Manual:
  - **/usr/share/doc/yuma/yumatools-user-manual.pdf**

If you installed the yuma-dev package, then the Yuma Tools Developer Manual is also installed:

- Yuma Tools Developer Manual:
  - **/usr/share/doc/yuma/yumatools-dev-manual.pdf**

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The unix 'man' program can be used to get documentation about each program. For example:

- **man yangcli**
- **man yangdump**
- **man yangdumpcode**
- **man yangdiff**
- **man netconfd**
- **man netconf-subsystem**

Each program also has extensive help information available with the **--help** CLI parameter. For example:

- **yangcli --help**
- **yangdump --help**
- **yangdumpcode --help**
- **yangdiff --help**
- **netconfd --help**

## 6.2 Running the Yuma Tools Programs

### 6.2.1 YANGCLI, YANGDUMP, YANGDIFF

If you are just using the Yuma client applications, then there is no further mandatory setup required.

- If a work directory is used, then the **\$YUMA\_HOME** environment variable needs to be defined. Refer to the user manual for details.
- If Yuma Tools is installed in a location other than the default location described above, then the **\$YUMA\_INSTALL** environment variable needs to be defined. Refer to the user manual for details.
- The following binary applications are available:
  - **/usr/bin/yangcli**: NETCONF-over-SSH client application
  - **/usr/bin/yangdump**: YANG compiler
  - **/usr/bin/yangdumpcode**: YANG source code generator
  - **/usr/bin/yangdiff**: YANG compare program

### 6.2.2 NETCONFD AND NETCONF-SUBSYSTEM

The Yuma server does not automatically start running when installed. This will be supported in a future release.

The following steps must be taken to start the **netconfd** server:

- You must modify the **/etc/ssh/sshd\_config** file, and add the 'netconf' subsystem, as described in the user manual. The following commands must be present:

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```
Port 22  
Port 830  
Subsystem netconf /usr/sbin/netconf-subsystem
```

- Start the **netconfd** server, as described in the user manual or quickstart guide. This can be in the foreground or the background. If it is in the background, then the '**--log**' CLI parameter should be provided, as shown below:

```
mydir> /usr/sbin/netconfd --log=$HOME/mylog &
```

- Restart the SSH server. This is a platform-specific task. Refer to the **sshd** manual page for your system for more details. This step may need to be run as root or with the 'sudo' program.

```
Fedora 12 version  
mydir> sudo /etc/rc.d/init.d/sshd restart
```

```
Ubuntu 9.10 version:  
mydir> sudo /etc/init.d/ssh restart
```