

SANKHYA Varadhi

Cross Platform Middleware

Getting Started Guide

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Part no: 10030105-003

SANKHYA Varadhi

- **Getting Started Guide**

Sankhya Technologies Private Limited

Part no: 10030105-003

Table 1: Revision History

Rev No:	Revision	Date
01	Updated for Varadhi 1.1A	23 Jul 2002
02	Updated for Varadhi 1.1B	07 Jul 2002
03	Updated for Varadhi 1.1C	22 Jan 2003

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Getting Started

1.1 Introduction to SANKHYA Varadhi

SANKHYA Varadhi is an Object Request Broker compliant with OMG's CORBA 2.2 (Minimum CORBA). Varadhi provides embedded systems developers a standards based framework for building and deploying distributed systems. The tools and components provided by Varadhi manage the complexities of language, location and system/processor dependencies enabling the developers to concentrate on implementing the application logic in the client and server. With its small footprint, high performance and easy configurability, Varadhi is ideally suited for systems where size and performance are important.

Varadhi provides the following development tools and utilities:

- **idlc**, the Varadhi IDL compiler that generates C++ stubs and skeletons
- **vconf**, the Varadhi interactive configuration tool
- **dumpior**, IOR tool to view stringified IOR files
- **ns**, Varadhi Naming Server
- **nsman**, Varadhi Naming Service Manager
- **es**, Event Server

Varadhi provides the following runtime components:

- **Object Request Broker** (Varadhi ORB)
- **Portable Object Adapter** (POA)

- Client **Stubs** (generated by Varadhi IDL compiler from IDL code)
- Server **Skeletons** (generated by Varadhi IDL compiler from IDL code)

1.2 System Requirements

Table 1 shows the development host, target CPU and compiler supported by Varadhi.

Development Host	Target	Compiler
Windows NT/2000 on x86 PC	Native PPC, x86, MIPS	Microsoft VC++ 6.0 GNU g++ 2.95.2
Solaris 2.7 on Sun E250	Native PPC, x86, MIPS	GNU g++ 2.95.2
Red Hat Linux 7.X on x86 PC	Native PPC, x86, MIPS	GNU g++ 2.95.2
Windows NT/2000	Win CE H/PC emula- tion for Pocket/Hand- held PC	Microsoft Embedded Visual C++ 3.0
OSE	PPC	GNU g++ 2.95.2 adapted for OSE
OSE	Windows Soft Kernel	Microsoft VC++ 6.0
QNX Neutrino	x86	QNX SDK (g++ 2.95.3)
MontaVista Linux	PowerPC(4xx)	GNU g++ 2.95.2
MontaVista Linux	MIPS 4Kc	GNU g++ 2.95.2
Cygwin	x86	GNU g++ 2.95.2

TABLE 1.

1.3 Installation

Please follow the installation instructions that you would have received by E-mail or along with the SANKHYA Varadhi Media.

1.3.1 SANKHYA Varadhi Licensing

You will require valid license records to use SANKHYA Varadhi on your host or target platform. For more details on Sankhya Varadhi Licensing refer the next chapter.

After installation on Solaris or Linux, the installed directory structure is as follows:

```

$INSTALL_DIR/sankhya/varadhi      - root installation directory
$INSTALL_DIR/sankhya/varadhi/LICENSE -License Agreement
$INSTALL_DIR/sankhya/varadhi/notice.txt -License Notification
$INSTALL_DIR/sankhya/varadhi/PORTING_SOURCE
                                     - List of files that constitute
                                     PORTING_SOURCE
                                     mentioned inthe License
                                     Agreement
$INSTALL_DIR/sankhya/varadhi/varadhi.csh - Varadhi script file

$INSTALL_DIR/sankhya/varadhi/bin    - Host tools like IDLC
$INSTALL_DIR/sankhya/varadhi/lib    - Varadhi library components
                                     for various configurations
$INSTALL_DIR/sankhya/varadhi/include - Varadhi header files
$INSTALL_DIR/sankhya/varadhi/etc    - Varadhi configuration files
$INSTALL_DIR/sankhya/varadhi/docs   - Varadhi Documentation
$INSTALL_DIR/sankhya/varadhi/samples - Varadhi samples directory

```

\$INSTALL_DIR/sankhya/varadhi/platforms -Varadhi pre-configured
 platforms
 \$INSTALL_DIR/sankhya/varadhi/platforms/default-sol2/src (for Solaris
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/default-sol2/lib (for Solaris
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/static-sol2/src (for Solaris
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/static-sol2/lib (for Solaris
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/default-linux/src (for Linux
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/default-linux/lib (for Linux
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/static-linux/src (for Linux
 installation)
 \$INSTALL_DIR/sankhya/varadhi/platforms/static-linux/lib (for Linux
 installation)

After installation on Windows, the installed directory structure is as follows:

%INSTALL_DIR%	-	root installation directory
%INSTALL_DIR%\LICENSE	-	License Agreement
%INSTALL_DIR%\notice.txt	-	License Notification
%INSTALL_DIR%\PORTING_SOURCE	-	List of files that constitute PORTING_SOURCE mentioned in the License Agreement.
%INSTALL_DIR%\varadhi.cmd	-	Varadhi command file
%INSTALL_DIR%\bin	-	Host tools like IDLC

%INSTALL_DIR%\lib	-	Varadhi library components for various configurations
%INSTALL_DIR%\include	-	Varadhi header files
%INSTALL_DIR%\etc	-	Varadhi configuration files
%INSTALL_DIR%\docs	-	Varadhi Documentation
%INSTALL_DIR%\samples	-	Varadhi samples directory
%INSTALL_DIR%\platforms	-	Varadhi pre-configured platforms
%INSTALL_DIR%\platforms\default-win32\src (for MS Windows)		
%INSTALL_DIR%\platforms\default-win32\lib (for MS Windows)		
%INSTALL_DIR%\platforms\static-win32\src (for MS Windows)		
%INSTALL_DIR%\platforms\static-win32\lib (for MS Windows)		

A separate installation guide for Varadhi on Win CE is available at <http://www.sankhya.com/info/products/varadhi/docs.html>

1.4 Getting Started

1.4.1 Pre-requisites

Development environment should be setup before using Varadhi. The following sections assume that the compiler and build tools are available in the path.

a. Solaris Host

Host : Sun Sparc Workstation
 Host OS : Solaris 2.7
 Tools : g++ 2.95.2 and above
 RAM : 32MB (64 MB recommended)

b. Linux Host

Host : x86 Linux PC
Host OS : Red Hat Linux 6.2
Tools : g++ 2.95.2 and above
RAM : 32MB (64 MB recommended)

c. Windows Host

Host : x86 PC
Host OS : Windows NT 4.0/Windows 2000
Tools : Microsoft VC++ 6.0
RAM : 64 MB

1.4.2 Running a Sample Program**1. Setup Varadhi Host Development environment**

Varadhi tools require the following environment variables to be set:

- VARADHI - Directory path pointing to the root of the installation
- VARADHI_HOST - Host platform name like sol2, linux and win32

In order to set these variables and PATH variable, source the varadhi script file *varadhi.csh* present in the SANKHYA Varadhi installation root directory.

On Windows host, run *varadhi.cmd* instead.

On Unix csh Prompt

```
% source <INSTALL_DIR>sankhya/varadhi/varadhi.csh
```

On Windows Command Prompt

```
c:\> <INSTALL_DIR>\varadhi.cmd
```

where <INSTALL_DIR> is the directory where Varadhi is installed.

By default Varadhi is installed under /opt/sankhya/varadhi on Unix and C:\sankhya\varadhi on Windows NT/2000.

2. Copy the demo program(s) to your work area

To build and run the demo, copy the demo to a work directory and build/run from there. This will ensure that the original installation directory does not get modified accidentally.

Determine a work directory (e.g. my_varadhi) where you will run the demos and change to that directory.

On Unix csh Prompt

```
% cd <work-directory>  
% set WORK_DIR='pwd'  
% cp -r $VARADHI/samples .
```

On Windows Command Prompt

```
C:\> cd <work-directory>  
<work-directory>\> set WORK_DIR=<Current_Working_directory>  
%WORK_DIR%\> copy %VARADHI%\samples .
```

3. Creating a Varadhi Target Platform

(For using a pre-built target platform, skip this and the next step, and continue from Step5)

Varadhi Platform is a directory which contains Varadhi run-time libraries and other platform specific files. Some Varadhi platforms may additionally contains sources for porting the Varadhi OS layer and Transport layer to custom target environments.

A Varadhi Platform can be created using "*vconf*", the interactive Varadhi configuration utility and various *vconf* configuration files available under \$VARADHI/etc/config directory (%VARADHI%\etc\config on Windows). *vconf* will display basic help message when invoked without arguments. See *vconf.txt* in the directory \$VARADHI/docs/help. (%VARADHI%\docs\help on Windows) for additional information on creating a Varadhi Platform.

For example, to create a default platform for your host (native target) that supports C++ Exception and uses dynamic heap allocation, use the following:

3.a Change directory to your workspace

On Unix csh Prompt

```
% cd $WORK_DIR
```

In Windows Command Prompt

```
C:\> cd %WORK_DIR%
```

3.b Invoke `vconf` with two config files, one providing configuration options for the ORB and the other specifying the target platform.

On Unix csh Prompt

```
% vconf defaults sol2-gcc
```

On Windows Command Prompt

```
%WORK_DIR%\> vconf defaults win32
```

For linux, use `linux-gcc` instead of `sol2-gcc`. The configuration that is built with 'defaults' configuration file, enables C++ Exception support.

4. Setup the Varadhi Target Platform Environment

The above configuration places a script file `platform.csh` in the `$VARADHI_PLATFORM` directory to setup Varadhi Target Environment. Here, `VARADHI_PLATFORM` refers to the root directory where Varadhi Platform is created.

On Unix csh Prompt

```
% cd $WORK_DIR/varadhi  
% source platform.csh
```

On Windows Command Prompt

```
%WORK_DIR%\> cd %WORK_DIR%\varadhi  
%WORK_DIR%\varadhi> platform.bat
```

This will set the following variables:

VARADHI_PLATFORM - Directory path pointing to the root of the created Target Platform

5. Use pre-built Varadhi Target Platform

(If you used steps 3 and 4, skip this step.)

Varadhi is shipped with pre-built Target platform for native host development on Solaris, Linux and Windows NT/2000. This can be used for testing the demos.

Step 1: List available pre-built Varadhi Platforms.

On Unix csh Prompt

```
%ls $VARADHI/platforms
```

On Windows Command Prompt

```
%WORK_DIR%\> dir %VARADHI%\platforms
```

Step 2: Set Varadhi Target Platform Environment

On Unix csh Prompt

```
% source $VARADHI/platforms/<pre_built_platform>/platform.csh
```

On Windows Command Prompt

```
%WORK_DIR%\>  
%VARADHI%\platforms\
```

Here, <pre-built-platform> refers to a pre-built Target platform directory name. The available pre-built target platforms are

- "**default-sol2**" and "**static-sol2**" for **Solaris**,
- "**default-linux**" and "**static-linux**" for **Linux**,
- "**default-win32**" and "**static-win32**" for **Windows NT/2000**.

6. Build the demo program

To build the demo program on Solaris and Linux, change directory to a particular demo directory and type make.

For example,

On Unix csh Prompt

```
% cd adder  
% make
```

To build the demo program on Windows NT/2000, change directory to a particular demo directory and type nmake /f makefile.nt

For example,

On Windows Command Prompt

```
%WORK_DIR%\> cd adder  
%WORK_DIR%\adder\> nmake /f makefile.nt
```

Note: This assumes that Microsoft VC++ environment is already set. This can be done as follows:

a. Change Directory to the location where vcvars32.bat is available. Usually, this location is:

`C:\Program Files\Microsoft Visual Studio\VC98\bin`

b. Run 'vcvars32.bat' by typing `vcvars32.bat` from command line after changing to the above directory

7. Running the demo program

To run the demo program, follow the steps mentioned in the README files in the demo directory. For example, to run the adder demo, start the 'server' application and then run the 'client' application. 'server' and 'client' are not required to be run on the same host.

a. Start the Server Application

On Unix csh Prompt

```
% server &
```

On Windows Command Prompt

```
%WORK_DIR%\adder\> server
```

b. Run the Client Application

On Unix csh Prompt

```
% client
```

On Windows Command Prompt

```
%WORK_DIR%\adder\> client
```

For Windows, the client executable must be run from another command window.

Alternatively, on Unix, use the 'run_demo' script in the demo directories to run the demo application. This script will invoke server in the background and invoke the client which prints the following:

```
Result of Adding 10, 25 = 35
```

```
Result of Adding -268435455, 268435453 = -2
```

The script will automatically terminate the server after the client exits.

1.5 Features Supported

For a list of features supported, refer to the SANKHYA Varadhi data sheet available at

URL : <http://www.sankhya.com/info/products/varadhi/docs/ds4.pdf>

1.6 Help Files

Help Files are available under \$VARADHI/docs/help on Unix

On Windows the location is %VARADHI%\docs\help

Sankhya Varadhi documentation set is also available online at
URL : <http://www.sankhya.com/info/products/varadhi/docs.html>

1.7. Uninstalling Varadhi

a. On Solaris and Linux

1) Change current directory to SANKHYA Varadhi root directory:

```
% cd $VARADHI
```

2) Move to parent directory

```
% cd ..
```

3) Check if you are in the correct Varadhi installation directory before proceeding with the next step:

```
% pwd
```

4) If you are in the correct installation directory (for e.g: if the default is /opt/sankhya), recursively remove the varadhi directory:

```
% rm -rf varadhi
```

In addition:

5) Remove any Varadhi Platform directories or other directories that you

may have created under \$VARADHI.

b. On Windows

- 1) Select Start -> Settings -> Control Panel
- 2) Click on Add/Remove Programs
- 3) Select SANKHYA Varadhi
- 4) Click Add/Remove Button

In addition:

- 5) Remove any Varadhi Platform directories that you may have created.

Sankhya Varadhi Licensing

2.1 Introduction

All Varadhi Host Tools, Target Platforms and Applications linked with Varadhi Target Platform require the presence of valid License Records for proper functioning.

Varadhi License Records are provided for all of the following tools along with the purchase of each developer license:

- **idlc** - Varadhi IDL to C++ Compiler
- **ns** - Varadhi Naming Server
- **es** - Varadhi Event Server
- **vconf** - Varadhi Configuration Tool
- **dumpior** - IOR dump utility
- **nsman** - Naming Service Manager utility
- **Run-Time** - Single Node Locked Run-Time License for ns and Sample Programs.

Sankhya grants Licensee a non-exclusive, non-transferable limited license to use the Software for the purpose of developing and deploying one Server-Application for a single platform (CPU/OS) upon payment of a Deployment License fee set forth in an attachment. Licensee may deploy the server application on additional platform or deploy additional Server-Application upon payment of an additional Deployment License Fee set

forth in an attachment.

No Run-Time license is checked by SANKHYA Varadhi when only client functionality is used. A Varadhi application is deemed to be a server application, if it tries to resolve RootPOA using `resolve_initial_references` ("RootPOA").

2.2 Default License File

License records must be present in the file "slicense.dat". By default Varadhi Tools will look for the license file in the following path:

```
$VARADHI/etc/slicense.dat
```

2.3 Overriding License File Path

The environment variable `VARADHI_LICENSE_FILE` may be set to override the default license file path.

Example:

On Unix hosts

```
% setenv VARADHI_LICENSE_FILE $HOME/licenses/slicense.dat
```

The above setting can be used to use the `slicense.dat` file present under `$HOME/licenses` instead of using the default path.

On Windows NT and Windows 2000

```
% set VARADHI_LICENSE_FILE=%Homedrive%\licenses\slicense.dat
```

2.4 Varadhi Run-Time Licensing

In most embedded environments, it may not always be possible to use a file to load license records. A Varadhi Run-Time license can be specified using a vconf configuration file when creating a Varadhi Platform. (refer to Varadhi User guide and Reference manual for a detailed explanation on vconf utility)

Example:

```
% vconf defaults sol2-gcc license.cfg
```

A platform created using the above command can be used to build applications that will incorporate any necessary license records within the executable image.

If you prefer to use a license.cfg file to specify license records at build time, instead of using an external file for Varadhi Run-Time license, you can indicate this preference when purchasing Varadhi Run-Time licenses and obtain the license in the form of license.cfg file, in addition to the slicense.dat file.

2.4.1 license.cfg

license.cfg file is the deployment license file for server applications. This file can be used to specify license records at build time.

1. varadhi::orb::license::l0b::resource

This parameter specifies the licensed Varadhi resource for which the license parameters are specified.

2. **varadhi::orb::license::l0b::date**

This parameter specifies the date up to which the license is valid.

3. **varadhi::orb::license::l0b::count**

This parameter specifies the number of deployment licenses you have purchased. The above means that 10 deployment licenses have been purchased.

4. **varadhi::orb::license::l0b::key**

This parameter is the license key.

5. **varadhi::orb::license::l0b::passwd**

This parameter specifies the password for the license feature and key.

2.5 **Trouble Shooting Licensing Failures**

If you encounter a licensing failure and you believe that you have valid license records for the tools you use, you may obtain additional information on the failure from the Varadhi Host Tools as follows:

On Unix Hosts:

```
% setenv VARADHI_LICENSE_VERBOSE 1
```

On Windows NT and Windows 2000:

```
% set VARADHI_LICENSE_VERBOSE=1
```

2.6 Obtaining Valid License Records

To receive valid license records for your host, please send the following information to varadhi-support@sankhya.com:

1. HostID

You can obtain HostID using the `hostid` command on Solaris and Linux hosts.

For Windows NT or Windows 2000 hosts, use the command

```
% ipconfig /all.
```

Your `hostid` is the Physical Address of the network card printed by `ipconfig`.

2. HostName and Host Operating System.

For More Information-

Varadhi Evaluation	http://www.sankhya.com/info/varadhi.html
Varadhi Download	http://www.sankhya.com/info/products/varadhi/download.html
Varadhi Roadmap	http://www.sankhya.com/info/products/varadhi/roadmap.html
Varadhi Documentation	http://www.sankhya.com/info/products/varadhi/docs.html
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