



Cisco Carrier Sensitive Routing Installation Guide (Version 1.1)

Cisco Carrier Sensitive Routing (CSR) Version 1.1 is designed to work with Cisco IOS Release 12.2(2)XU and future IOS releases.

This document contains information on installation of the CSR components that include the following:

- CSR application
 - Core application
 - Database tables (schema)
 - Default data
- CSR graphical user interface (GUI)—For provisioning the PostgreSQL database
- PostgreSQL Database—For storing provisioned data, this database provides the asynchronous notification between the CSR application and the GUI.

For more information on PostgreSQL, go to the following URL:

<http://www.postgresql.org>.

This site contains information on building PostgreSQL on other platforms.

Related Documentation and References

- Sun/Solaris (general)
<http://www.sun.com>
- Sun/Solaris (patches)
<http://sunsolve.sun.com>
- Sun/Java
<http://java.sun.com>
- PostgreSQL database
<http://www.postgresql.org>



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- Cisco Carrier Sensitive Routing User Guide

Before You Begin

This section contains requirements and conditions that should be met before installing the CSR components.

General Requirements

- Knowledge of UNIX operating system and commands, including those required for system administration (add or change file permission)
- System privileges for UNIX system to implement system administration tasks
- Root access to the UNIX system is required for the following tasks:
 - Create users
 - Modify syslog.conf and init.d files
 - Modify rc.d configurations
 - Installing CSR



Note If you do not have root access, you have to replace the /usr/local path occurrences with the path where postgres and csr files are installed during the CSR installation process.

- Java2 Run-time Environment (JRE)
- Configured Cisco gatekeeper or gateway
- 10 MB of space available on the drive containing /usr/local
- 2 GB for swap (for optimal performance)
- 1 GB of main memory (RAM)
- 4 GB of disk space
- Domain naming system server
- PATH environment variable setup for gzip, tar, java
- Sun system connected to existing TCP/IP network
- Sun system sized correctly for predicted load
- Sun system dedicated to the CSR components
- The GUI requires Windows environment (95, NT, 2000), or Xwindows or equivalent if running directly on a Sun/Solaris platform. Solaris 8 is supported.

Sample Hardware Platforms

- Netra T1 AC200
- Netra T 1405
- Netra 20 (formerly T4)

- Netra 1120

Estimated performance of some of the sample platforms are as follows.



Note

These estimates characterize using a minimally configured production system where the Route Server is sized to operate at or below 60% of capacity. All non-Netra T1405 estimates were extrapolated from the characterization of a Netra T 1405 with 2CPUs.

- Netra 1120 with 1 440mhz CPU: 250 Route Requests per second
- Netra T1 AC200: 300 Route Requests per second
- Netra T 1405 with 2 CPUs: 600 Route Requests per second
- Netra T 1405 with 4 CPUs: 1200 Route Requests per second
- Netra 20 (formerly T4) with 2 CPUs: 1000 Route Requests per second

The above characteristics were measured or extrapolated from a Netra T1405 system provisioned with the following carrier selection rules and response characteristics.

- A set of four carrier selection rules consisting of the following:
 - 1 Origination rejection rule
 - 1 termination rejection rule
 - 2 Carrier Selection rules
- Each request returns 4 carriers
- Each Carrier has 3 contacts
- A digit match pattern depth of five digits

As the complexity of any of the 4 characteristics doubles, the user should estimate a 30% decrease in the number of Route Requests serviced per second. There is no significant increase in performance if a less complex network than the one stated above is used. This profile is a representation of a minimal configuration.

Minimum Required Configurations for Sample Platforms

The following tables describes the minimum required configurations for each supported platform.

Table 1 *Netra T1 AC200 Platform*

Configurations	Order Number (Sun)
<p>The Netra T1 High Availability configuration* requires two Netra T1 AC200 servers. Each server contains the following:</p> <ul style="list-style-type: none"> • 500 MHz processor • 1 GB of memory • Two 18 GB disks • Two 10/100BaseT F/W Ethernet card • DVD • Two Netra D130 72GB external storage arrays • SunCluster 3.0 Software and Media • Solaris 8 (required and included) 	<p>N21-HBCS1-1P1G-IP</p>
<p>The Netra T1 Server configuration requires a Netra T1 AC200 server that contains the following:</p> <ul style="list-style-type: none"> • 500 MHz processor • 1 GB of memory • Two 18 GB disks • 10/100BaseT F/W Ethernet card • DVD-ROM • Solaris 8 (required and included) 	<p>N21-HBCS2-1P1G-IP</p>

*This configuration requires Veritas Volume Manager (purchase separately) as follows:

- One VFSTS-311-9999 Veritas Volume Manager 3.1.1 Base Pack
- Two VVMGS-999-W999 Veritas Volume Manager License

Table 2 *Netra T1405 Platform*

Configurations	Order Number (Sun)
<p>The Netra T 1405 High Availability configuration* requires two Netra T1405 servers. Each server contains the following:</p> <ul style="list-style-type: none"> • Two 440 MHz processors • 2 GB of memory • Two 36 GB disks • Two Quad FastEthernet card, two dual-channel Diff USCSI adapter • DVD-ROM • Two Netra D1000 72 GB external storage arrays • SunCluster 3.0 Software and Media • Solaris 8 (required and included) 	N14-HBCS1-2P2G-IP
<p>Netra T 1405 with D1000 storage array configuration requires a Netra T 1405 server that contains the following:</p> <ul style="list-style-type: none"> • Four 440MHz processors • 4 GB of memory • Two 36 GB disks • Four 36 GB Netra D1000 external storage • One QFE • One Diff USCSI • DVD-ROM • Solaris 8 included 	N14-HBCS1-4P4G-IP

Table 2 *Netra T1405 Platform*

Configurations	Order Number (Sun)
The Netra T 1405 Server configuration requires a Netra T 1405 server that contains the following: <ul style="list-style-type: none"> • Two 440MHz processors • 2 GB of memory • Four 36 GB disks • One Quad FastEthernet card • DVD-ROM • Solaris 8 included 	N14-HBCS2-2P2G-IP
Netra T 1405 Server configuration requires a Netra T 1405 server that contains the following: <ul style="list-style-type: none"> • Four 440MHz, processors • 4 GB of memory • Four 36 GB disks • One Quad FastEthernet card • DVD-ROM • Solaris 8 included 	N14-HBCS2-4P4G-IP

*This configuration requires Veritas Volume Manager (purchase separately) as follows:

- One VFSTS-311-9999 Veritas Volume Manager 3.1.1 Base Pack
- Two VVMGS-999-W999 Veritas Volume Manager License

Table 3 *Netra 20 Platform*

Configurations	Order Number (Sun)
Netra 20 with D1000 storage array configuration requires one Netra 20 server that contains the following: <ul style="list-style-type: none"> • Two 750 MHz processors • 2 GB of memory • Two 36 GB disks • One Netra D1000 external storage (four 36GB) • One QFE, one Diff USCSI • DVD-ROM • Solaris 8 (required and included) 	N28-HBCS1-2P2G-IP
The Netra 20 Server configuration requires a Netra 20 server that contains the following: <ul style="list-style-type: none"> • Two 750 MHz processors • 2 GB of memory • Two 36GB disks • One Quad FastEthernet card • DVD-ROM • Solaris 8 (required and included) 	N28-HBCS2-2P2G-IP

Table 4 *Netra 1120 Platform*

Configurations	Order Number (Sun)
This platform requires the following: <ul style="list-style-type: none"> • 1 GB of memory • Two 18 GB disks 	Not available

Installing CSR

The installation media is a CD. The root directory of the CD contains the following files:

- **postgres.tar.gz**—Contains the entire directory structure and binaries for the PostgreSQL database.
- **csr.tar.gz**—Contains the CSR application with the runtime executable and the necessary configuration files.
- **csrgui.tar.gz**—Contains the CSR Graphical User Interface (GUI) and related files.

To begin installation, perform the following steps:

-
- Step 1 Place the CSR CD in the CD drive. The CD is automatically mounted to the location /cdrom.
 - Step 2 Install and configure the PostgreSQL database. See [Installing the PostgreSQL Database, page 8](#).
 - Step 3 Install the CSR application. See [Installing the CSR Application, page 13](#).
 - Step 4 Install the CSR GUI. See [Installing the CSR GUI, page 17](#).

Installing the PostgreSQL Database

The following section describes:

- [Variables in Unix Environment, page 8](#)
- [PostgreSQL Database Installation, page 9](#)

Variables in Unix Environment

In a UNIX environment, variables can be used to customize the behavior of certain applications. In C shell, all environment variables can be displayed by using the **setenv** command with no arguments.



Note

In command examples in this document, when C shell is used, it is indicated by the `cs` prefix appears before the command prompt—`%`. When the Bourne shell is used, it is indicated by the `sh` prefix appears before the command prompt—`%`.

For example, LPDEST variable can be set to the value `per319` by entering the following command for C shell and Bourne shell respectively:

```
cs % setenv LPDEST per319

sh % export LPDEST=per319
or
sh % LPDEST=per319; export LPDEST
```

The value of the LPDEST variable can be displayed by entering the following command:

```
% echo $LPDEST
```

Changes to PATH Environment Variables

The path variable or PATH environment variable is a list of directories in which executable commands can be found. An executable command in a path can be executed by entering the name of the application instead of the full path. For example, **axe** instead of **/usr/bin/X11/axe**.

In C (cs) shells, the path can be changed either through the `set path` or `setenv PATH` commands. Changes are automatically propagated between the path and PATH variables. The `set path` command is recommended, as shown in the following examples:

```
cs % set path = (/usr/bin /usr/bin/X11 /usr/lang /usr/local/bin)
cs % setenv PATH /usr/bin:/usr/bin/X11:/usr/lang:/usr/local/bin
```

In Bourne (sh) shells, the `export` command can be used, as shown in the following examples:

```
sh % export PATH=/usr/bin:/usr/bin/X11:/usr/lang:/usr/local/bin
```

In some computer systems, the path contains numerous directories and it is difficult to set the path with a single command. The default “.cshrc” file for Sun™ systems can set multiple paths and combines these paths into the desired path variable, as shown in the following example:


```
csh % set path = ($path1 $path2 $path3 $path4 $path5 $path6 $path7)
```

The current setting of the path variable can be displayed with either one of the following commands:

```
csh % echo $path
sh % echo $PATH
```

postgreSQL Database Installation

To install the postgreSQL database, perform the following steps:

Step 1 Login to the UNIX system as root.

Step 2 Create a UNIX account with the user name postgres.

The postgres processes run under the postgres username. This new account should be used in the following steps to create the postgres account.



Note The home directory created for the postgres user in this document is /users/postgres. You can any home directory as your choice. If you use another directory, the /users/postgres directory occurrences are replaced by the home directory that you select.

A user can be created with one of the following methods:

- Use the **admintool** graphical tool by entering the following command at the system prompt:

```
# admintool
```

- Enter **useradd** and **passwd** commands at the system prompt as follows:

```
# useradd -d /user/postgres -m -s /usr/bin/sh postgres
```

The **-d** option specifies the home directory location for this user (Bourne shell). The **-s** option specifies the shell to be used by this user.

```
#passwd postgres
New password: <password for postgres user>
Re-enter new password: <password for postgres user>
```

The **passwd** command creates a password for the new postgres user.



Caution

For security purposes, do not allow the postgres user access to the root/bin directory.

Step 3 Create /usr/local/pgsql directory and assign ownership of this directory to postgres by entering the following commands:

```
mkdir /usr/local/pgsql
chown postgres /usr/local/pgsql
```



Note Alternatively, postgres user can change to a directory where the user has write access. You can replace all occurrences of /usr/local/pgsql (including those in variables, paths and scripts) by the directory you select.

Step 4 If you want to change the path, enter the following commands:

```
csh % set path = ($path /usr/new/bin)
csh % rehash
```



Note /usr/new/bin is an example for a path.

Step 5 Login to the Solaris system as the postgres user, then update the users profile by adding or modifying the following variables to allow the postgres user the execution of PostgreSQL.



Note For Bourne (sh) shell, add the “.profile” file by using the “variable=value” format: PGDATA=/usr/local/pgsql/data. For C (csh) shell, add the “.cshrc” file by using the **setenv** command: **setenv** PGDATA /usr/local/pgsql/data.

Add the following variables:



Note The following example are for the Bourne (sh) shell.

- **PGDATA**—Location of data
PGDATA=/usr/local/pgsql/data
- **PGLIB**—Location of libraries
PGLIB=/usr/local/pgsql/lib

Modify the following variables:

- **PATH**—Path for the postgres files
PATH=\$PATH:/usr/local/pgsql/bin and PATH=\$PATH:/etc/init.d
- **MANPATH**—Allows the **man** command to reach manual pages of postgres
MANPATH=\$MANPATH:/usr/local/pgsql/man
- **LD_LIBRARY_PATH**—Shows application where postgres libraries are located
LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:/usr/local/pgsql/lib

Step 6 For Bourne shell, export all the variables with the **export** command as in the following example:

```
export PGDATA PGLIB PATH MANPATH LD_LIBRARY_PATH
```

Step 7 For Bourne shell, read the “.\$HOME/.profile” file into memory with the following command:

```
sh % . $HOME/.profile
```

For C shell, read the “.cshrc” file into memory with the following command:

```
csh % source ~/.cshrc
```

Step 8 Install the PostgreSQL database.



Note The PostgreSQL database requires 4 MB of disk space in addition to the data to be inserted into the database. The database is installed in the /usr/local/pgsql directory.

- a. Login to the Solaris system as the postgres user.
- b. Copy the installedcd.tar file on the CD to your home directory using the **cp** command.

```
csh % cp /cdrom/cdrom0/installedcd.tar ~
or
sh % cp /cdrom/cdrom0/installedcd.tar $HOME
```

- c. Extract the individual files with the following commands:

```
tar -xvf installedcd.tar postgres.tar.gz
```

- d. Unzip the postgres.tar.gz file with the following command:

```
gunzip postgres.tar.gz
```

- e. Change directory to /usr/local (install directory) with the following command:

```
cd /usr/local
```

- f. Untar the file to the correct location with the following command for C shell and Bourne shell respectively:

```
csh % tar -xvf ~/postgres.tar
or
sh % tar -xvf $HOME/postgres.tar
```



Note Use the command **su** to access root if necessary, and specify the entire path to tar files.

- g. Remove the postgres.tar file from the home directory with the following command for C shell and Bourne shell respectively:

```
csh % rm ~/postgres.tar
or
sh % rm $HOME/postgres.tar
```

In the /usr/local/pgsql directory, the following directories are created by the installation.

- bin—PostgreSQL binaries
- doc—Documentation for administrator, programmer, user, and tutorials
- include—Files used in applications to build programs that use PostgreSQL
- lib—Libraries used in applications to build programs that use PostgreSQL
- man—Manual pages for PostgreSQL

Installing and Configuring the PostgreSQL Database

To install and configure the PostgreSQL database, perform the following steps.

- Step 1** Change the ownership of the postgres files by entering the following command:

```
chown -R postgres /usr/local/pgsql
```

The database is installed.

- Step 2** At the UNIX prompt, initialize the database by entering the following command:

```
initdb
```

The file structure and default data for the PostgreSQL database are created. A directory, data, is created in the /usr/local/pgsql directory. The data directory contains database files for user and database data.



Note For security purposes, do not enter this command as root. Enter this command as postgres.

- Step 3** Add write access and permission to the owner of the PostgreSQL security configuration file by entering the **chmod** command, as shown in the following example:

```
chmod u+w /usr/local/pgsql/data/pg_hba.conf.
```

- Step 4** Update the permissions in the database security file by adding the following in the /usr/local/pgsql/data/pg_hba.conf file.

```
host all 127.0.0.1 0.0.0.0 trust
```

Activating the PostgreSQL Database

To activate the PostgreSQL database each time the system starts, update the init.d and rc2.d directories by performing the following steps:

- Step 1** Login to the system as root.

- Step 2** Copy the postgres_init file from /usr/local/pgsql to /etc/rc2.d/ to /etc/init.d/, with the following commands:

```
cp /usr/local/pgsql/postgres_init /etc/rc2.d/S98postgres_init
cp /usr/local/pgsql/postgres_init /etc/init.d/postgres_init
```

- Step 3** Give the files above execution permissions with the following commands:

```
chmod +x /etc/rc2.d/S98postgres_init
chmod +x /etc/init.d/postgres_init
```

The steps above also enable the capabilities of starting, stopping and restarting the database.

- To start postgres, provide the UNIX postgres user's password when prompted and enter the following command:

```
/etc/init.d/postgres_init start
```

- To stop postgres, enter the following command:

```
/etc/init.d/postgres_init stop
```

- To restart postgres, enter the following command:

```
/etc/init.d/postgres_init restart
```

Verifying Successful PostgreSQL Database Installation

To verify that the installation was successful, perform the following steps:

-
- Step 1** Create a database with the name testdb by entering the following command:

```
createdb testdb
```

- Step 2** Connect to database testdb by entering the following commands:

```
psql testdb
testdb=>
```

- Step 3** At the postgres prompt, enter an SQL statement as follows:

```
testdb=> SELECT datetime 'now';
```



Note 'now' in the SQL statement is enclosed in single quotes.

The system returns data similar to the following:

```
?column?
-----
2001-02-15 12:31:37-05
```

- Step 4** Exit psql by entering the following command:

```
testdb=> \q
```

- Step 5** Remove database testdb by entering the following command:

```
dropdb testdb
```



Note If you have servers with console login, disable the Xwindow in .profile file. Otherwise, the database cannot be reloaded from a system reboot.

Installing the CSR Application

To install the CSR application, perform the following steps:

-
- Step 1** Login to the system as root.

- Step 2** Create a ciscocr UNIX account.

A ciscocr user must be created in order to run the CSR processes. Users can be created using the admintool graphical tool by entering the following command at the system prompt:

```
# admintool
```

Alternatively, users can be created by using **useradd** and **passwd** as follows:

```
#useradd -d /users/ciscocsr -m -s /usr/bin/sh ciscocsr
#passwd ciscocsr
New password: <password for ciscocsr user>
Re-enter new password: <password for ciscocsr user>
```

Use this new user account in the following steps.

Step 3 Create the /usr/local/csr and /usr/local/csr/app directories by entering the following commands:

```
mkdir /usr/local/csr
mkdir /usr/local/csr/app
mkdir /usr/local/csr/gui
chown -R ciscocsr /usr/local/csr
```

Step 4 Update the users profile by adding or modifying the following variables in the profile for the ciscocsr user.

Add the following variables:



Note The following examples are for the Bourne (sh) shell.

- **PGDATA**—Location of the data

```
PGDATA=/usr/local/pgsql/data
```

- **PGLIB**—Location of libraries

```
PGLIB=/usr/local/pgsql/lib
```

Modify the following variables:

- **PATH**—Includes the path for the postgres files

```
PATH=$PATH:/usr/local/pgsql/bin
```

```
PATH=$PATH:/etc/init.d
```

```
PATH=$PATH:/usr/local/csr/app
```

```
PATH=$PATH:/usr/local/csr/gui
```

- **MANPATH**—Allows the command **man** to reach the manual pages of postgres

```
MANPATH=$MANPATH:/usr/local/pgsql/man
```

- **LD_LIBRARY_PATH**—Shows the application where postgres libraries are located

```
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/pgsql/lib
```



Note Check if your local java installation location is different from this location. If it is different, include the location in the PATH. See [“Installing the CSR GUI” section on page 17](#).

Step 5 For Bourne shell, export all variables with the **export** command; for example:

```
export PGDATA PGLIB PATH MANPATH LD_LIBRARY_PATH
```

Step 6 Read the “.profile” file into memory by entering the following command:

```
% . ./profile
```

Step 7 Install the CSR application. The CSR application requires 5 MB of disk space. The CSR is installed in the `/usr/local/csr/app` directory.

- a. Login to the Sun/Solaris system as the `ciscocsr` user.
- b. Copy the `installed.tar` file on the CD to your home directory using the `cp` command.

```
csh % cp /cdrom/cdrom0/installed.tar ~
or
sh % cp /cdrom/cdrom0/installed.tar $HOME
```

- c. Extract the `csr.tar.gz` by entering the following command:

```
tar -xvf installed.tar csr.tar.gz
```

- d. Unzip the file by entering the following command:

```
gunzip csr.tar.gz
```

- e. Change the directory to the install directory `/usr/local/csr/app` by entering the following command:

```
cd /usr/local/csr/app
```

- f. Untar the file by entering the following command:

```
tar -xvf ~/csr.tar
or
sh % tar -xvf $HOME/csr.tar
```



Note Use the command `su` to access root if necessary, and specify the entire path to `csr.tar`.

- g. Remove the tar file from the home directory by entering the following command:

```
rm ~/csr.tar
or
sh % rm $HOME/csr.tar
```

- h. Change the ownership of the CSR files by entering the following command:

```
chown -R ciscocsr /usr/local/csr/app
```

Configuring the CSR Application

This section describes how to configure the CSR application.

To activate the CSR each time the system starts, update the `init.d` and `rc2.d` directories after you logged in as root, and perform the following steps:

Step 1 Copy the `csr_init` file from `/usr/local/csr/app` to `/etc/rc2.d/` and to `/etc/init.d/` by entering the following commands:

```
cp /usr/local/csr/app/csr_init /etc/init.d/csr_init
cp /usr/local/csr/app/csr_init /etc/rc2.d/S99csr_init
```

Step 2 Give the execution permissions to the files mentioned above by entering the following commands.

```
chmod +x /etc/init.d/csr_init
chmod +x /etc/rc2.d/S99csr_init
```

Importing Default Data

The PostgreSQL database is currently empty. A schema must be created for the CSR application to allow a small set of data be placed in the database. This set of data is provided with the installation package.



Note When you create the db users, answer Yes to the questions that appear. These users are re-created in the security section of this document.

To import data, perform the following steps:

-
- Step 1** Login as the postgres user.
- Step 2** Create the db user for ciscocsr by entering the following command:
- ```
createuser ciscocsr
```
- Step 3** Create the db user for the ciscogui by entering the following command:
- ```
createuser ciscogui
```
- Step 4** Change directories to the CSR application directory by entering the following command:
- ```
cd /usr/local/csr/app/
```
- Step 5** Enter the PostgreSQL SQL interface as ciscocsr by entering the following command:
- ```
createcsrdb csrdb
```



Note Database tables must be set up for the CSR application to start.

Verifying Successful CSR Application Installation

To verify that the installation is successful, perform the following steps:

-
- Step 1** Assuming that the error messages in syslog (a mechanism for logging messages) are set up to log to /var/adm/messages, monitor the messages file by entering the following command:
- ```
tail -f /var/adm/messages
```
- Check the /etc/syslog.conf file location, if it is different from /var/adm/messages. For more detail on syslog, see [Appendix A, “Logging,”](#) or the online manual page for “syslog.conf”.
- Step 2** In another console window, login as the ciscocsr user.
- Step 3** Activate the CSR application by entering the following command:
- ```
csr csrdb &
```
- The CSR application is binding to the database csrdb.
- Step 4** In the console window for monitoring the messages, verify that the message “CSR Started” appears. You can enter the **csr_init start** command to start the application.
-

Installing the CSR GUI

This section describes the CSR GUI installation. This installation requires .5 MB of disk space on the computer system, and should be installed in the /usr/local/csr/gui directory.

To use the GUI, JRE (Java2) must be installed on the Sun/Solaris system or the Windows NT system.

-
- Step 1** Use the following URLs to download the Java run-time and patches:
- Java run-time—<http://java.sun.com>
 - Solaris patches—<http://sunsolve.sun.com>
- For example, to download java 2 Runtime environment version 1.3.0_02, performing the following steps:
- a. Enter **java.sun.com/j2se/1.3/jre/download-solaris.html** at `http://` prompt to access java.sun.com
 - b. Download `j2re-1_3_1_02-solsparc.sh` to your installation directory (for example, /usr/local directory)
 - c. Change directory to /usr/local with command: **cd /usr/local**
 - d. Click on `j2re-1_3_1_02-solsparc.sh` to execute this file. The java executable is in /usr/local/j2re1_3_1_02/bin directory.
 - e. Add java in your path in .profile file by entering the following command:


```
PATH=$PATH:/usr/local/j2re1_3_1_02/bin
```
- Step 2** Verify Java2 run time is available by entering the following command and observe the output.
- ```
% java -version
```
- If the resulting output does not contain “Java(TM) 2 Runtime Environment”, the JRE is not Java2. In the following examples, Example 1 is a Java2 JRE output, and Example 2 is a Non-Java2 JRE output.

**Example 1**

```
% java -version
java version "1.3.0_02"
Java(TM) 2 Runtime Environment, Standard Edition (build 1.3.0_02)
Java HotSpot(TM) Client VM (build 1.3.0_02, mixed mode)
```

**Example 2**

```
% java -version
java version "1.2.2"
Solaris VM (build Solaris_JDK_1.2.2_05a, native threads, sunwjit)
```

**Note**

The JAVA application should be entered in the PATH variable. See the [“Installing the CSR Application”](#) section on page 13.

**Installing on Sun/Solaris**

The following steps describe installation of the CSR GUI on a Sun/Solaris system:

- 
- Step 1** Login to the Solaris system as the ciscocsr user.
- Step 2** Extract the csrgui.tar.gz by entering the following command:
- ```
tar -xvf installed.tar csrgui.tar.gz
```
- Step 3** Unzip the file by entering the following command:
- ```
gunzip csrgui.tar.gz
```
- Step 4** Create directory structure by entering the following command:
- ```
mkdir /usr/local/csr/gui
```
- Step 5** Change directory to /usr/local/csr/gui by entering the following command:
- ```
cd /usr/local/csr/gui
```
- Step 6** Untar the file by entering the following command:
- ```
tar -xvf ~/csrgui.tar
or
sh % tar -xvf $HOME/csrgui.tar
```



Note “Use the command **su** to access root if necessary, and specify the entire path to csr.tar.”

- Step 7** Remove the tar file from the home directory by entering the following command:
- ```
rm ~/csrgui.tar
or
sh % rm $HOME/csrgui.tar
```
- Step 8** Copy the UNIX version of the startup file to a new name by entering the following command:
- ```
cp /usr/local/csr/gui/csrgui.unix /usr/local/csr/gui/csrgui
```

Step 9 Change file attributes on the renamed startup file by entering the following command:

```
chmod +x /usr/local/csr/gui/csrgui
```

Step 10 Change the ownership of the installed files by entering the following command:

```
chown -R ciscocsr /usr/local/csr/gui
```

You can run the GUI from the location `/usr/local/csr/gui/csrgui`.

Installing on Microsoft Windows NT

To install the CSR GUI on a Microsoft Windows NT system, perform the following steps:

Step 1 Copy the `csrgui.tar.gz` file to the Windows NT system.

Step 2 Unzip or untar the file to the desired location by using an application such as winzip.

Step 3 Remove the `.tar` file.



Note To run the GUI from the directory where the `csrgui.bat` file is installed, enter `csrgui` at the system prompt after installation.

Verifying Successful CSR GUI Installation

To verify that the installation was successful, perform the following steps:

Solaris

Step 1 To start the GUI, enter the following command:

```
/usr/local/csr/gui/csrgui &
```

The Login dialog box appears.

Step 2 Enter the following information in the entry boxes on the screen:

- User Name—`ciscocsr`
- Password—Any password (except blank)
- DB Host Name—Hostname or IP address. This depends on the network setup of the system that contains PostgreSQL.
- DB Port—The port that PostgreSQL is listening to. The default port number is 5432.
- Database Name—`csrdb`

Click **Login**. The CSR window appears.

Step 3 To exit the GUI, click **Exit**.

Windows NT

Step 1 To start the GUI, change to the directory where the GUI is installed, then enter the following command:

```
csrgui
```

The Login dialog box appears.

Step 2 Answer the questions by providing the following information:

- User Name—ciscocr
- Password—Any password (except blank)
- DB Host Name—Hostname or IP address. This depends on the network setup of the system that contains postgresQL.
- DB Port—The port that postgresQL is listening to. The default port number is 5432.
- Database Name—csrdb

Continue the login process as shown on the screen. The main window of the GUI appears.

Step 3 To exit the GUI, click **Exit**.

Database Security

The recommended security configuration is as follows:

- Allow local access to the database without a password
- Require a password for remote access

Following is an overview of the setup.

- For administration purpose, use “postgres” as user.

This user is fully protected. A password is required for remote access.

- Create the “ciscocr” user for running the CSR application.

This user can access the database without a password from the local host system. Otherwise, the CSR application requires the password to be passed in as a parameter. This password is visible to any user with access to the /etc/init.d/ directory.

- Create one or more users as GUI users.

These users must have a password to access the database remotely or locally.

Updating the postgres Administrator User

To add the postgres user password to ensure security in the database, perform the following steps:

Step 1 Activate the psql application by entering the following command:

```
psql
```

This issues SQL queries.

Step 2 Set the password by entering the desired password in place of “password” by entering in the following command:

```
postgres=# UPDATE pg_shadow SET passwd='password' WHERE username='postgres';
```

Step 3 Exit the application by entering the following command:

```
postgres=# \q
```

Creating Ciscocsr User

To remove and create ciscocsr users, perform the following steps:

Step 1 Remove the ciscocsr user from the database by entering the following command:

```
dropuser ciscocsr
```

Step 2 Create the ciscocsr user (with password) by entering the following command:

```
createuser -P ciscocsr
```

Step 3 Enter the password for this user twice.

Step 4 Enter N to answer the following question:

```
Shall the new user be allowed to create databases?
```

Step 5 Enter N to answer the following question:

```
Shall the new user be allowed to create more new users?
```



Note Multiple users may be created with different names.

Updating Network Permissions for the Database

The postgres database can be accessed through the network. The `/usr/local/pgsql/data/pg_hba.conf` file must be modified to indicate the IP addresses for connection and password requirements.

Follow the instructions in this file to customize the security for your particular needs. The following line is required in the setting of CSR:

```
Local csbdb trust ciscocsr
```

This allows the ciscocsr user local access to the csbdb database without a password.

Uninstalling CSR Components

To uninstall the CSR, perform the following steps. Root access must be available before you uninstall.

Step 1 Remove the CSR application by entering the following command:

```
rm -rf /usr/local/csr/app
```

Step 2 Remove the CSR GUI by entering the following command:

```
rm -rf /usr/local/csr/gui
```

Step 3 Remove the postgresQL database by entering the following command:

```
rm -rf /usr/local/pgsql
```

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
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Documentation Feedback

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Cisco Systems
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170 West Tasman Drive
San Jose, CA 95134-9883

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Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

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<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.

- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

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