Chapter 2

2 Installation

In this chapter you will learn about the SpectrumSCM system requirements, how to install and uninstall SpectrumSCM components, and you will become familiar with the basic security features.

Typically, the SpectrumSCM server is installed on a shared machine (server / host) and the users install client/UI components on their machines. Users may access SpectrumSCM functionality **via six** interfaces:

- The SpectrumSCM GUI client application
- The command line interface (CLI),
- The SpectrumSCM applet (web access, browser)
- The SpectrumSCM WebStart interface (web access, no browser)
- SCMlite (CRs and reports only through the browser)
- IDE plugins (Eclipse and Microsoft SCCI)

The SpectrumSCM UI and the command line interface are "standalone" (they function independently of a Web browser). They are installed on a client machine and access the SpectrumSCM application that is hosted on the shared server.

The SpectrumSCM applet and SCMlite utilize a Web browser and require Web pages to be installed on a webserver that has access to the SpectrumSCM server.

The SpectrumSCM WebStart interface takes advantage of Sun Microsystem's WebStart functionality to download and run a SpectrumSCM client directly across the web. The advantage of using this mode is that it frees the user (or administrator) from having to install the client locally. WebStart can automatically detect when the client application has been updated and will automatically download the new application version to the users local machine, when necessary. Also, WebStart runs independent of the browser and thus a browser is not required once WebStart has been added to the client's machine.

The SpectrumSCM application and applet provide the same full graphical user interface functionality. SpectrumSCM is the only CM product that provides a web access to the tool's complete CM functionality.

The SpectrumSCM command line interface provides most SpectrumSCM functionality (and adds a few other abilities, such as starting/stopping the SpectrumSCM server) from the command line.
SCMlite provides a limited subset of SpectrumSCM functionality directly through a web-browser using HTML. Currently, only Change Request Creation and Reports can be accessed via SCMlite.

2.1 Minimum System Requirements

SpectrumSCM can be installed on any platform that supports Java™ Runtime Environment (JVM).

2.1.1 Standalone

CPU	Memory	Disk Space
Pentium (Min: 500MHz, Recommended: 800MHz)	256MB RAM	50MB + project storage space.

2.1.2 Multi-user Server

No. Of Users	CPU	Memory	Disk Space
<5 users	Pentium 800MHz	256MB RAM	50MB + project storage space.
6-20 users	Pentium 1GHz	512MB RAM	50MB + project storage space.
>20 users	Pentium (Min: 1GHz, Recommended: 2.5GHz +)	1GB RAM	50MB + project storage space.

2.1.3 Client

CPU	Memory	Disk Space
Pentium 800MHz	256MB RAM	30MB + project storage space.

2.2 Basic Installation Instructions

SpectrumSCM requires a Java Runtime Environment Version 1.4 or higher on both client and server machines. It is also recommended that all OS-specific patches be installed; check the vendor's web page for patches and updates.

Install Java 1.4 or the latest JVM. The SpectrumSCM CD contains a recent JVM bundled on the CD for MS-Windows, Unix, and Linux platforms. Alternatively, download the latest JVM from your OS/JVM provider (version 1.4 or later).

A typical enterprise installation:

- **Step 1: Install and configure the SpectrumSCM server on a shared host.** This is usually done by the server administrator, using the default id/password "scm" "scm". The SpectrumSCM server administrator should immediately change the password for this id and

retain it for any server administration that has to be performed, such as changes to the system files or security setting.

- **Step 2: Create SpectrumSCM system ids for the users who will be installing client software.** *See details on creating ids in Chapter 5, User Management.*
- **Step 3:** If users will be accessing the server via the web, **install the web pages.**

2.3 Installing the Server

Unix / Linux installation instructions

1) Insert the SpectrumSCM installation CD
2) Mount the CD (if your version does not auto mount CD drives
3) Change directory to the CD drive.
4) Run the install.sh script from the CD.

Windows installation instructions

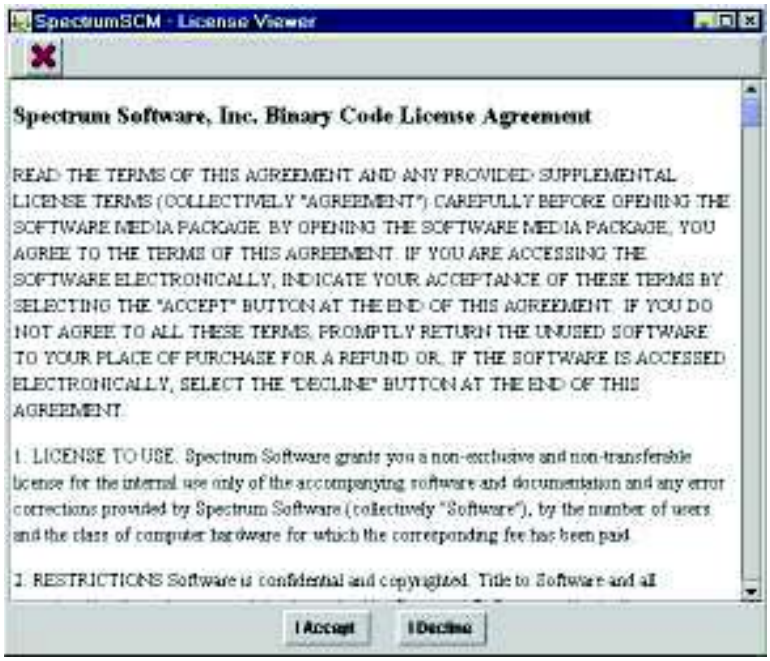
1) Inserting the SpectrumSCM CD should trigger the auto-installer. Please wait while the installer initializes.
2) If the auto-installer does not trigger run the **install.bat** script from the CD.

The basic installation process is automated. and it is the same on all platforms.

NOTE: Most examples in this user guide use MS-Windows directory structure and notation. If you are working on a Unix or Linux platform, remember that the directory structure uses forward slashes (/) instead of the back slashes (\) used in Windows.

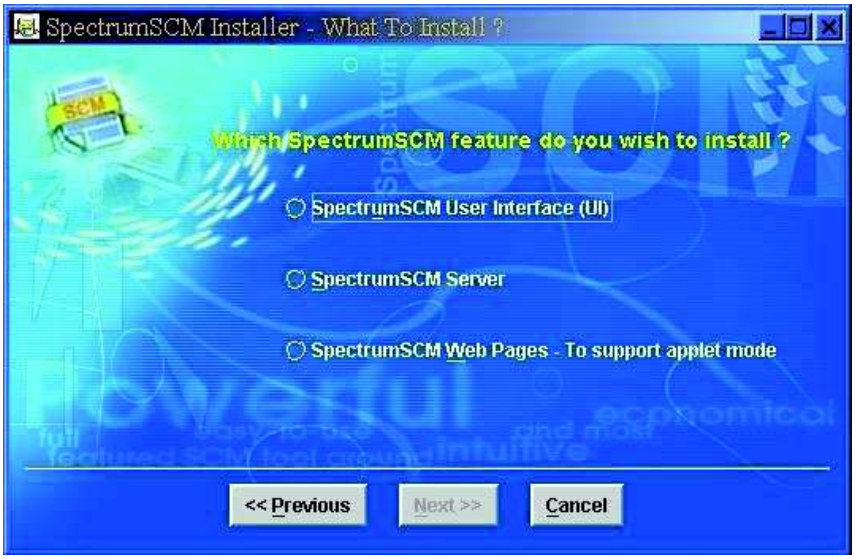
On all systems, once the installation process has started, the **SpectrumSCM Installer** screen will be displayed. Click **Next** to proceed.

The End User License Agreement will be displayed.. Read it and click **I Accept** to continue.



2.3.1 What to Install?

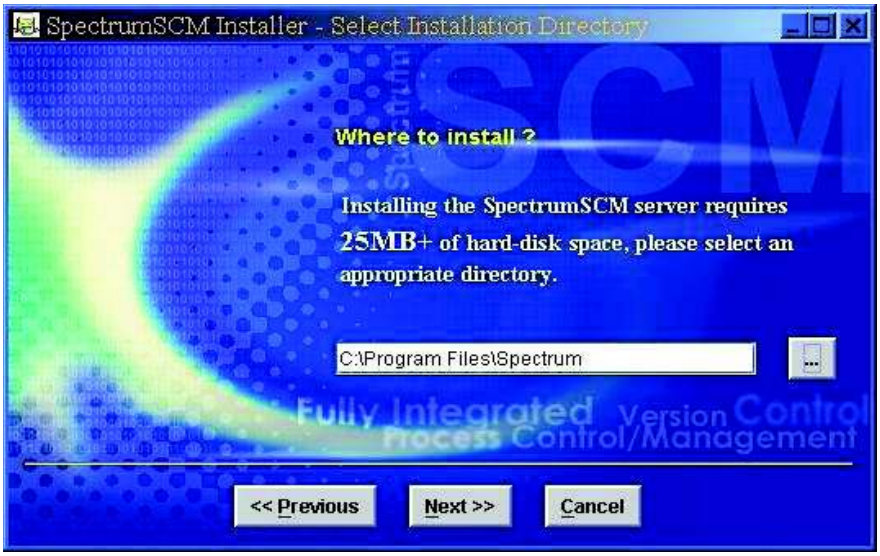
Select Install **SpectrumSCM Server** – this is typically done first, by the server administrator, to install the SpectrumSCM server on a shared host. This option also installs an instance of the Graphical User Interface and command line functions onto the host machine.



Click **Next** to proceed. Clicking on the **Cancel** button will exit the installation.

2.3.2 Where to Install?

A prompt for the directory to install the SpectrumSCM tool is displayed. Type in or select a directory in which to install the SpectrumSCM components. If the directory does not exist, the system will prompt if you wish to add it. Click Next to proceed.



Browse button. You can browse the system to select a directory using the browse button

2.3.3 E-mail Configuration (simple setup without authentification)

SpectrumSCM supports full e-mail notifications of Change Request creation and transitions. In fact by setting this up, automatic email notifications happen in real time for CR/Task creations, assignments, re-assignments, progressions, workflow transitions etc. You do not have to manually send an email when you create/assign/progress an incident or CR.

These emails are sent to the person to whom it is assigned and to all stake holders (based on the roles/workflow rules) instantaneously in real time. In addition the Task/CR shows up on the individuals CR list on the main SpectrumSCM screen when they log in as well.

Most organizations that use SpectrumSCM use the email notification to facilitate workflow. The email option notifies users when CRs are assigned to them so they can immediately begin to work on them. All users set up with the **"generic engineer"** designation are also notified each time a CR changes state, is progressed, is assigned, or is in the TBA (to be assigned state) and needs to be assigned *(see Chapter 5 for details on user setup)*. To set up email notification, enter mail server contact

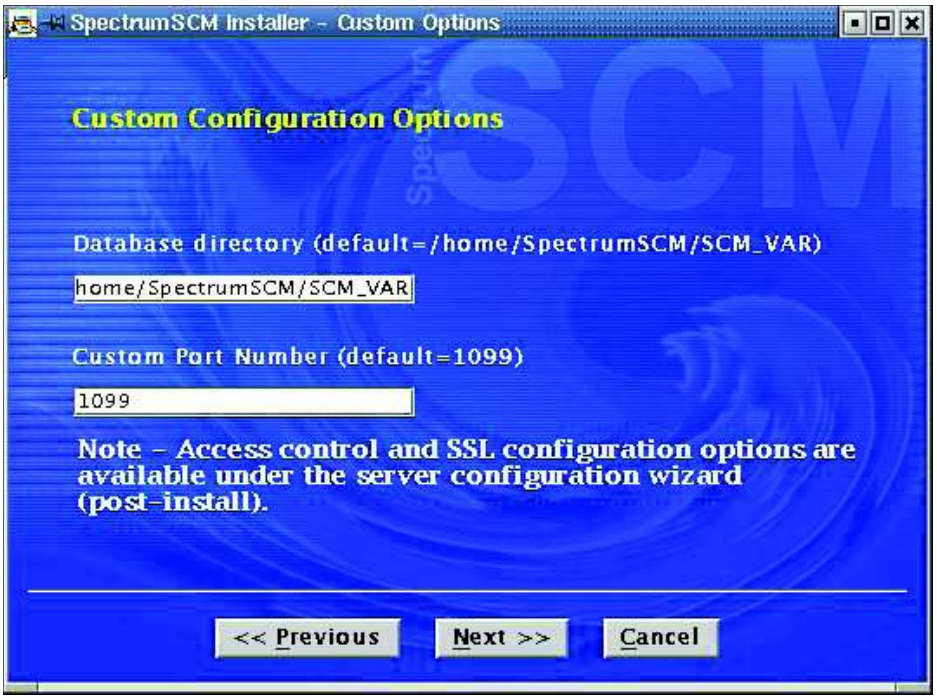
information (for example, smtp.mindspring.com) for notification and the e-mail "from" address. The "from" address will be the address used when mail is sent out from SpectrumSCM. If you do not wish to use the email feature, select "**Do not use e-mail notification"** (but you will miss out on a major workflow feature of the SpectrumSCM product!).

2.3.4 E-mail Configuration With Authentification

Please refer to **Sec 12.6 of Chapter 12 Administrative Functions** for more details on setting this up.

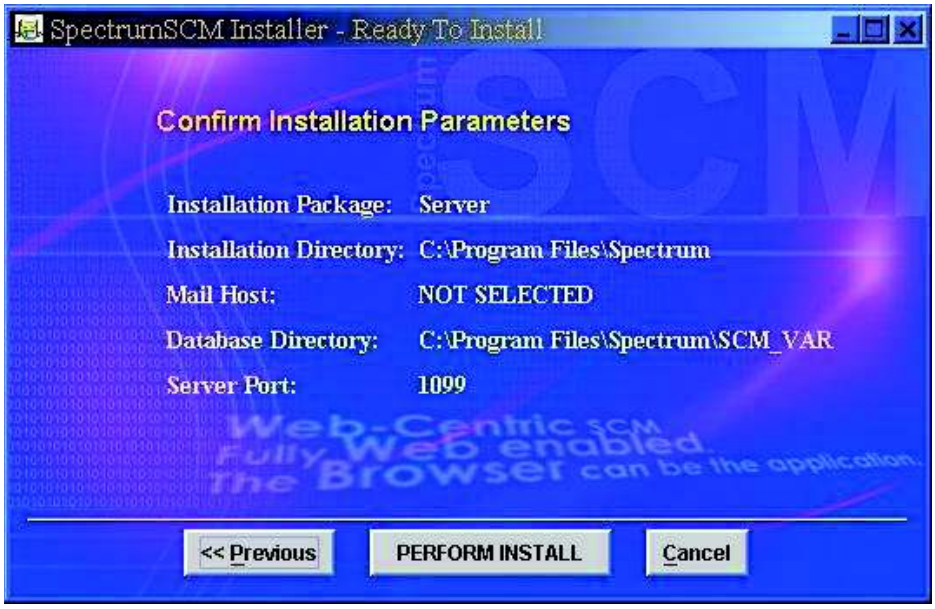
2.3.5 Standard or Custom Installation?

The custom installation option allows specification of the database directory and a custom port number. The standard installation uses the default database directory SCM_VAR inside your overall installation directory and the default port number 1099.



2.3.6 SpectrumSCM Installer

Review the Parameters given. If they are correct, click **Perform Install**.



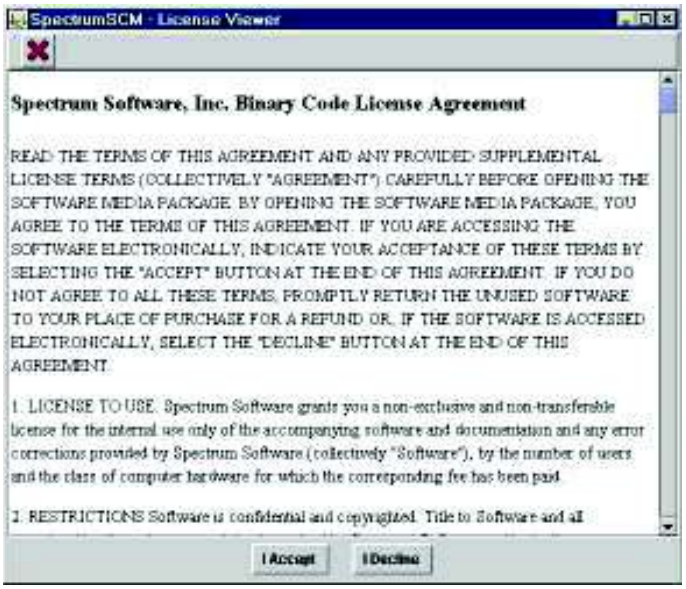
2.3.7 Installation Successful Screen

The desired result is the Installation Successful Screen. This should complete your installation.

A list of files installed is placed into <installation directory>\scmfilelist.

2.4 Install the SpectrumSCM User Interface (UI)

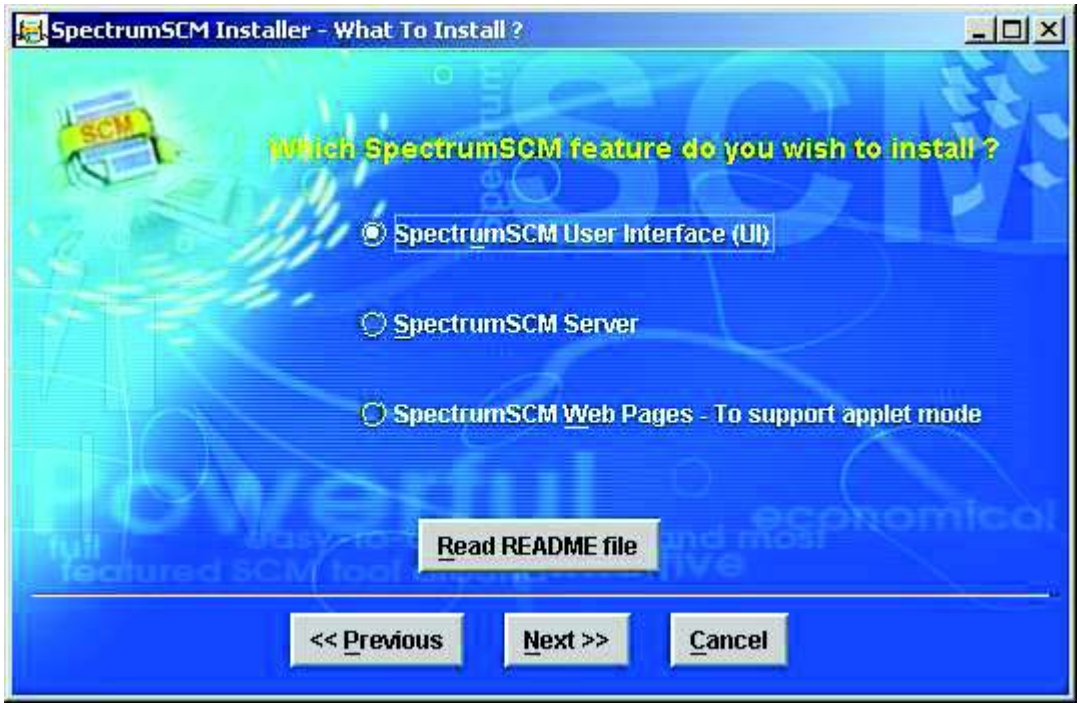
The **End User License Agreement** will be displayed. Read it and click **I Accept** to continue.



NOTE: Most examples in this user guide use MS-Windows directory structure and notation. If you are working on a Unix or Linux platform, remember that the directory structure uses forward slashes (/) instead of the back slashes (\) used in Windows.

2.4.1 What to Install?

Select Install **SpectrumSCM User Interface (UI).** This option installs an instance of the Graphical User Interface.

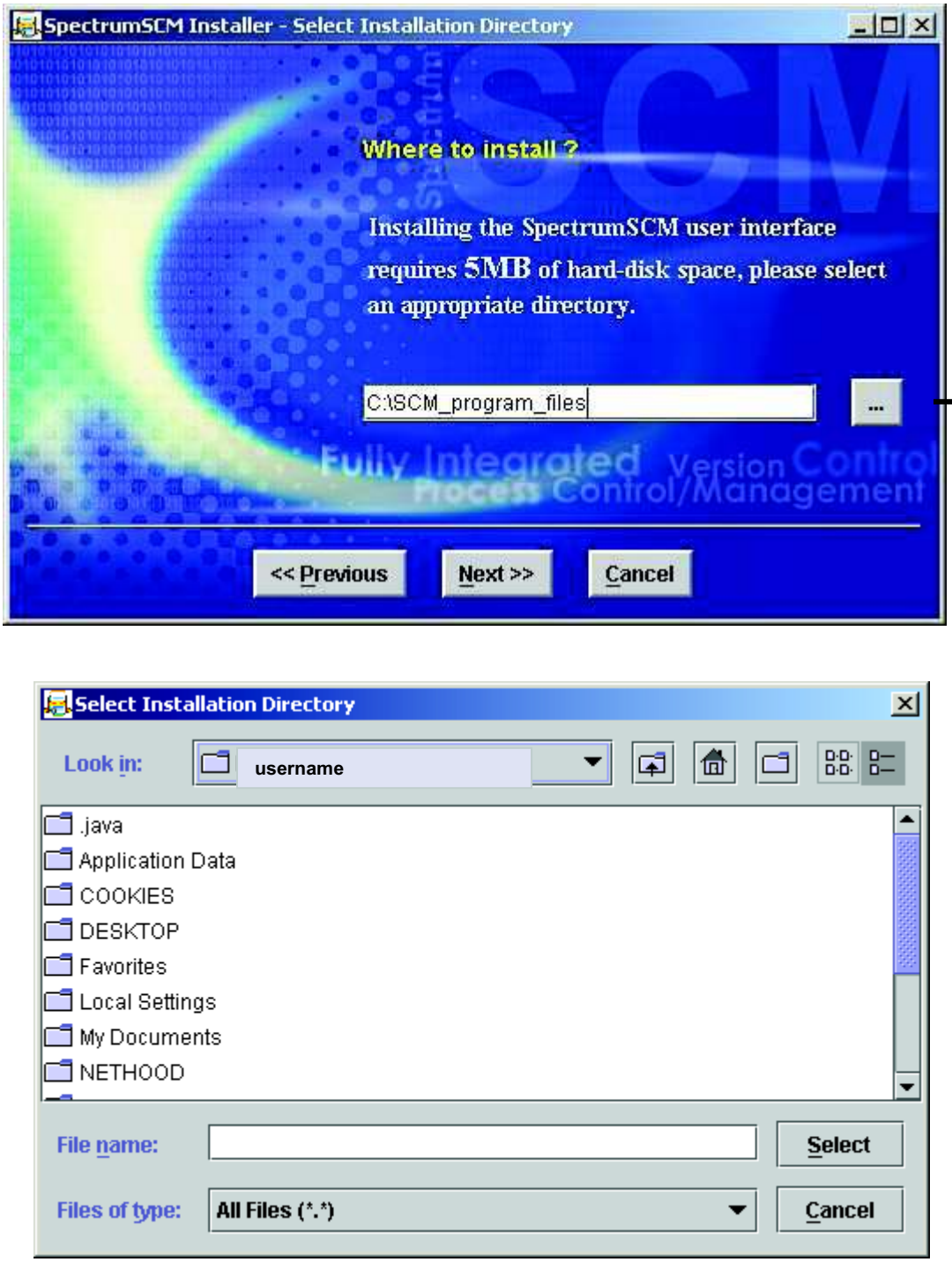


Click **next** to proceed. Clicking on the **Cancel** button will exit the installation.

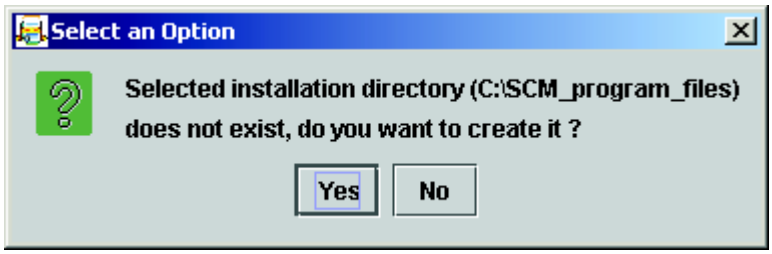
2.4.2 Where to Install

Choose an appropriate directory to install the SpectrumSCM UI components.

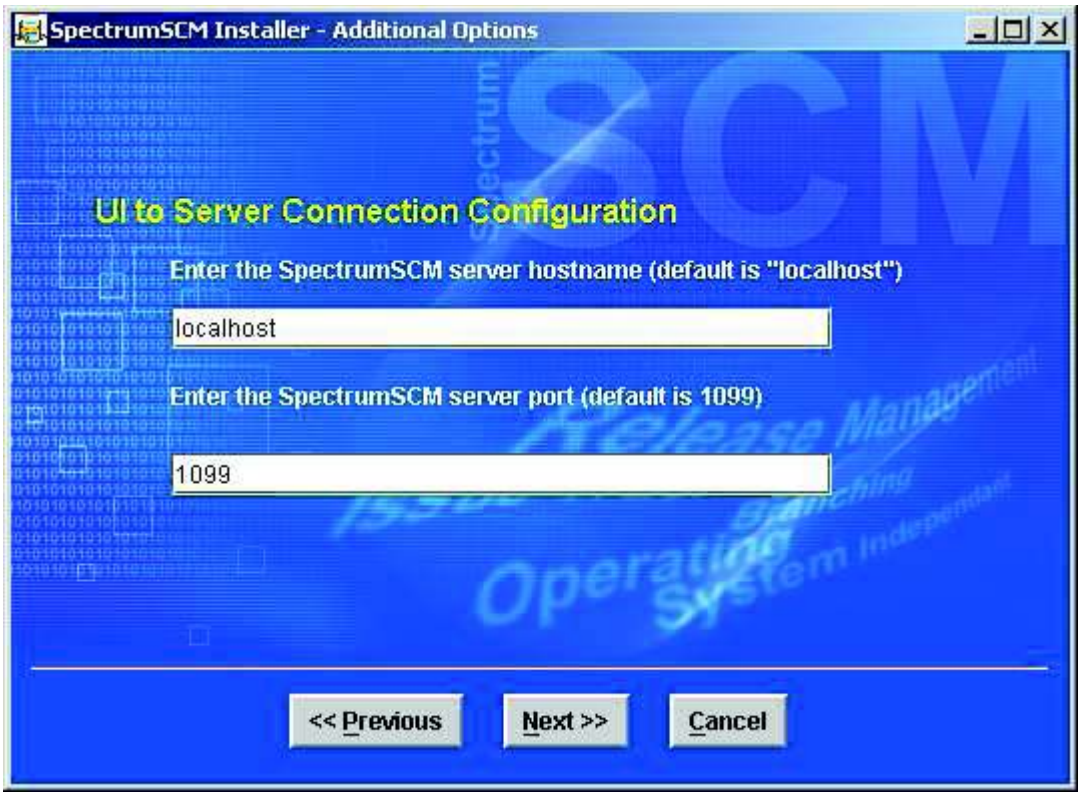
Type in a directory name or use the Browse button  to select an existing directory. If the directory does not exist, the system will prompt if you wish to add it.



If you choose to create a new directory for the installation, you will confirm by clicking YES:



Your SpectrumSCM Server administrator or project leader will provide the appropriate server hostname or IP address and port number. You can add to or change these later using the SpectrumSCM UI Configuration Wizard *(see Chapter 3)*.



Confirm Installation Parameters. If correct, click **PERFORM INSTALL**. If incorrect, click **Previous** to make corrections.

To see a list of the files installed, see *scmfilelist* in the installation directory.

2.4.3 To start the SpectrumSCM UI

- In a Windows environment click the Start → Programs → SpectrumSCM server → **START UI** or execute **<folder where UI is installed>\bin\ startUI.bat** from the command prompt window
- In a Unix or Linux environment, **cd <directory where the UI is installed/bin>** and execute the command **startUI**

You will be asked to provide your SpectrumSCM login ID. Initial password is "default".

2.5 Install the SpectrumSCM web pages

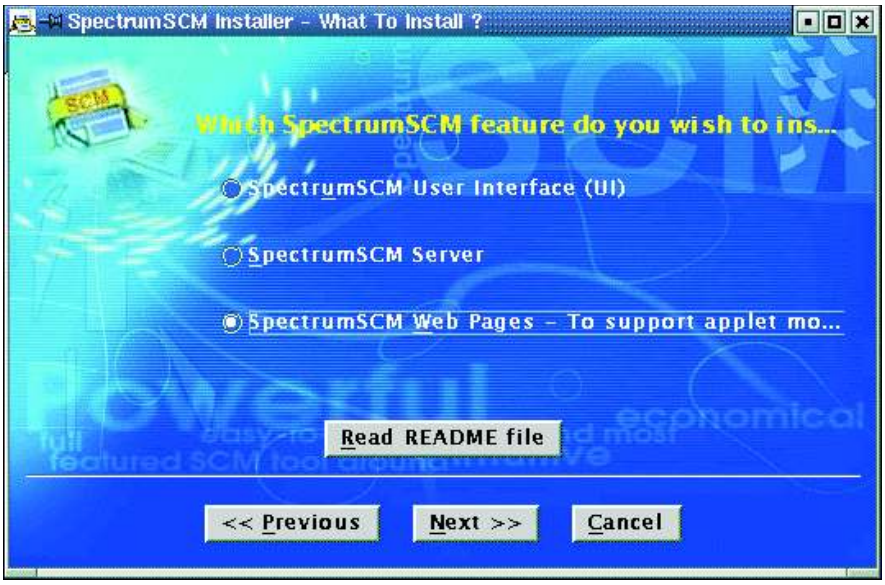
The SpectrumSCM web-pages install supports 2 modes of working, the Java™ Web-Start and the Applet modes. Both start-up methods are similar in that the user selects on the appropriate icon on a web-page. Java Web-Start however starts the actual application instance so that it runs independent from the browser, while the applet version runs through the browser itself. The Web-Start method is generally more popular because accidental closing or redirection of the browser will not close the SpectrumSCM connection, as would occur with the Applet mode.

The primary advantage a web-install has over a direct client install is that the user interface is only installed or updated once by the SpectrumSCM administrators. Users would then automatically get the (possibly updated) application without further action. Sometimes the direct client install is required, for example to use the client side commandline routines or to use the Microsoft Visual Studio (SCCI) IDE integrations.

To use the Web modes of the application, the SpectrumSCM Web Pages must be installed on a system running a web server, specifically a fully operational web server configured on the same network where the SpectrumSCM Server is located.

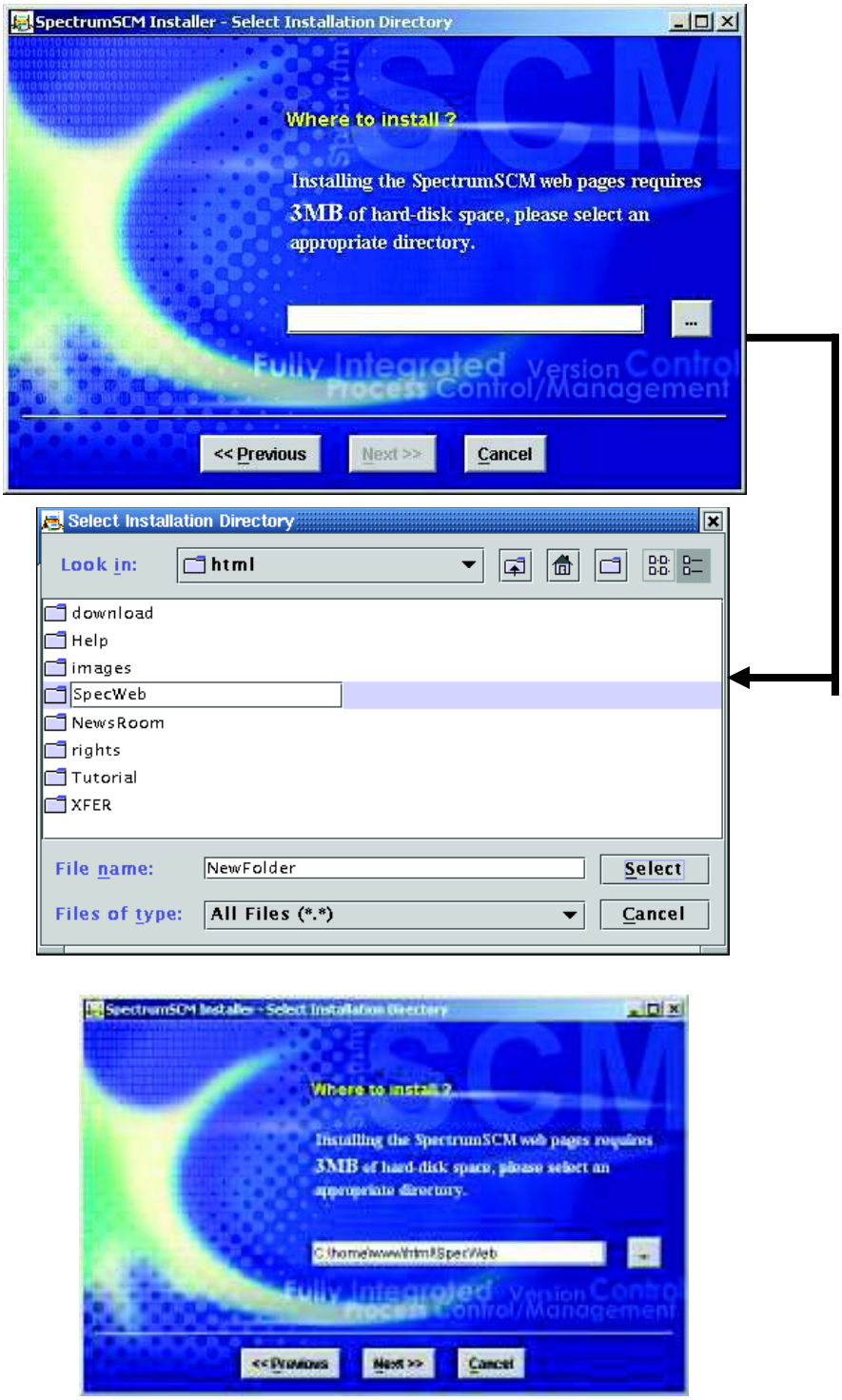
The directory in which the web pages are installed will need to be accessed by your web server. Some OS specific work might be required to set this up. For example, if using RedHat Linux with Apache, the root directory for the SpectrumSCM Web home must also be defined in the Apache config file. If using Microsoft IIS, the default web root is C:\Inetpub\wwwroot, so you could install under the C:\Inetpub\wwwroot\SpectrumSCM folder as an example.

The SpectrumSCM Web pages must be installed in the configured directory (specify it when prompted for the installation directory).



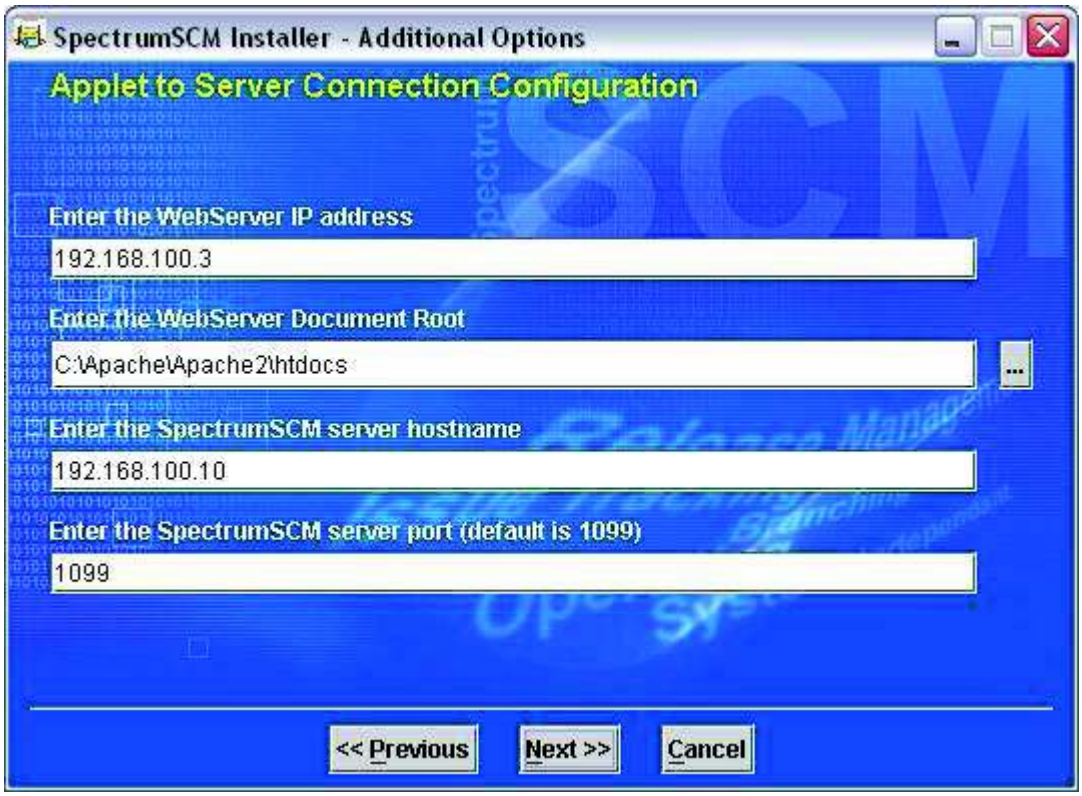
2.5.1 Where to Install

Type in the name of the root directory for the SpectrumSCM Web home directory name or use the Browse button  to select it.



Enter the Web server IP address, the WebServer document root directory, the SpectrumSCM server hostname or IP address and the server port (default is 1099). Click NEXT.

If you're not sure what your webserver's Document Root directory is, contact your web master for assistance.



Confirm installation directory, hostname, and server port and click **Perform Install**. If there are errors, click **Previous** to correct.

NOTE: Most examples in this user guide use MS-Windows directory structure and notation. If you are working on a Unix or Linux platform, remember that the directory structure uses forward slashes (/) instead of the back slashes (\) used in Windows.

A successful installation screen will be displayed., confirming the location of the web pages. Make a note of the Web Pages installation directory.

2.5.2 Applet specific items

To use the Web Applet mode of the application, additional, OS specific work might be required. This is because the applet runs as part of the browser and so is restricted by the browsers security controls.

For example, if using RedHat Linux 7.1 with Apache, the root directory for the SpectrumSCM Web home must also be defined in the Apache config file. The SpectrumSCM Web pages must be installed in that directory (specify it when prompted for the installation directory).

```
<Directory "/home/www/html/SpectrumSCM">
Options Indexes Includes FollowSymLinks
AllowOverride None
Order allow, deny
Allow from all
</Directory>
```

2.6 Accessing the web pages

The SpectrumSCM applet and WebStart interface allow access to the SpectrumSCM server via an Internet Browser. The WebStart interface only requires the use of a browser one time, to download the JNLP file. Once the JNLP (WebStart file) is installed in the local system, a browser is not required to start the SpectrumSCM client across the web.
To use the Web Applet mode of the application, the SpectrumSCM Web Pages must be installed on a system running a web server, specifically a fully operational web server configured on the same network where the SpectrumSCM Server is located.

To use the SpectrumSCM via WebStart or the applet:

Open a browser (IE or Netscape) and enter the URL to access the server that has access to the desired instance of SpectrumSCM server. Your SpectrumSCM Administrator should be able to provide the URL that is based on the directory in which the web pages have been installed.

If the web server pages are installed in directory X on the web server Y relative to the web server main page, then the URL to access SpectrumSCM would be http://www.Y/X/scmIntro.html. Note that if the SpectrumSCM pages are installed in the main page directory then X will be empty, resulting in the URL www.http://www.Y/scmIntro.html.

For example, if the webserver address is **http://www.spectrumscm.com** and the web pages are installed in a sub-directory off the main page (SCMWeb), the direct path is **http://www.spectrumscm.com/SCMWeb/scmIntro.html.**

The hostname supplied in the applet installation is the name that is used in the HTML to contact the server from the client. Therefore the client will need to be able to ping that name/address. Modifications to the **hosts/lmhosts** files might be necessary to achieve successful communications.

Due to Java applet security controls, for SpectrumSCM to access the local hard disk for operations such as check-out or read in from disk, a Java security popup will be presented. Accept this to allow SpectrumSCM to function fully. If this certificate is not granted accesses to the local disk will be forbidden and errors will occur whenever such an operation is attempted.

2.7 SCMlite

SCMlite provides a more limited subset of SCM functionality (Currently, Change Request Creation and Reports). SCMlite provides lightweight access to SCM tailored for casual users and is NOT intended to replace, only to complement, the full-featured interfaces required by developers and testers.

Why SCMlite? Some users may wish to access SCM over a low-bandwidth connection or their relationship to the project may not require access to the full SCM feature set. A customer may need access to SCM just to input CRs to file issues or request improvements; or a manager may wish to generate reports. Both need quick and easy access to limited functionality.

SCMlite is a pure HTML interface that does not require any active content or components (such as Java). There is no overhead associated with starting Java or downloading the SCM applet. In addition, there is a great reduction of training required for the casual SCM user.

SCMlite provide two SCM features:

- Change Request Creation
- Reports

SCMlite communications can be secured using SSL (https).

2.7.1 Enabling SCMlite

SCMlite is installed on the server with the WebPages. It is not turned on. To enable SCMlite, changes to the ***scm.properties file*** SCMlite section are required:

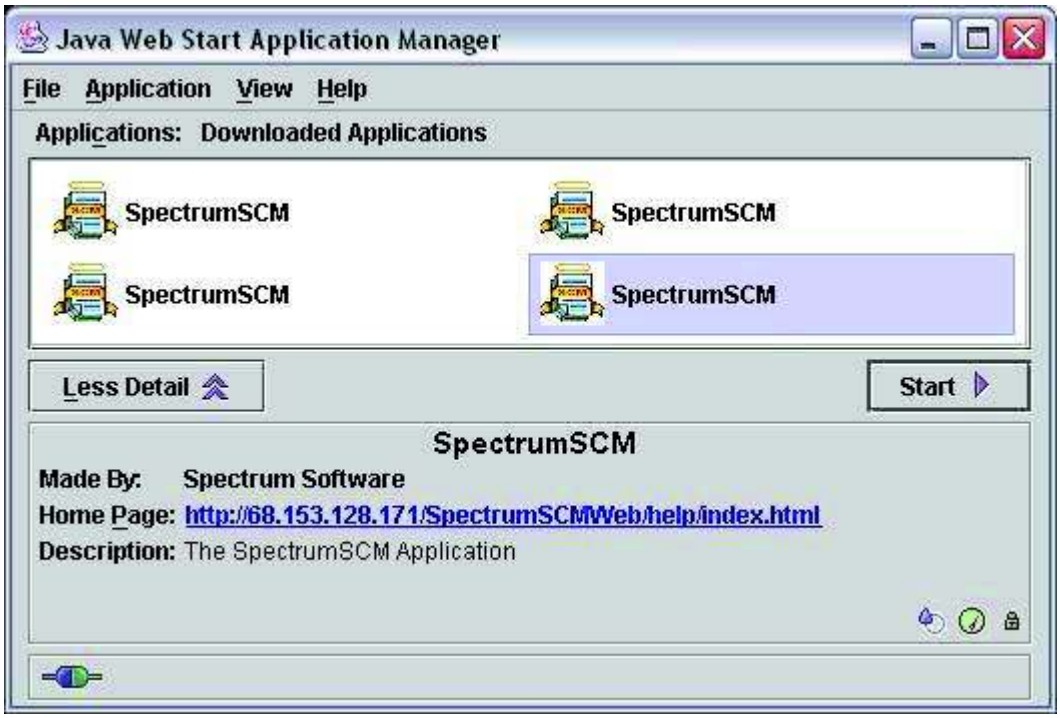
```
## SCMlite can utilize SSL to provide secure HTTP (HTTPS). Please refer
# to the second half of SSL properties, found below.   <== If SCMlite will use SSL, refer to
                                                            Communications Security above and
                                                            Chapter 3 for details on the SSL
                                                            section of the scm.properties file

## Indicates whether SCM should provide SCMlite (the HTTP interface).
## scm.http.inUse                  true    <== copy, remove #  to allow access to SCMLite

## The SCMlite interface port.
# Defaults to 1 greater than the scm.port, 1100.
## scm.http.port           12346                   <== copy, remove # and change port number if
required

## The maximum number of HTTP interface clients.
# If set to zero, any number of clients may connect.
## scm.http.maximumConnections     1       <== copy, remove # and change port number if required
#
# ^
```

(See Chapter 3 for details on making these changes directly or via the server configuration wizard)

2.7.2 Accessing WebStart, the Applet or SCMlite

To access the application via WebStart, the Applet or SCMlite, go to the same URL set up for accessing the SpectrumSCM system via the web. The web page will provide the option to logon to SpectrumSCM via WebStart, the applet or SCMlite.

If Webstart is not currently installed on your machine, use the supplied link to navigate to Sun's web pages and then download and install WebStart. Once installed, the WebStart console can be invoked by selecting WebStart from your desktop or by navigating through the Start menu options. Normally there is no need to start the WebStart console manually. The console will be automatically activated each time you access the SpectrumSCM client via WebStart. On your second attempt at starting SpectrumSCM via WebStart, the WebStart console will prompt the user to install a SpectrumSCM short cut on the desktop or in the start menu hierarchy. You can choose to do this or simply use the WebStart console to start SpectrumSCM instead of going through the browser:



In this example WebStart console, there are four (4) separate instances of SpectrumSCM installed. Each instance points to a separate instance of the SpectrumSCM server. Simply select the instance of the client to use and then press the "Start" button to activate the client. WebStart will automatically detect whether the jar files have changed and, if they have, automatically update the cached jars to the latest versions. This is an excellent solution for large group installations as the client and server software can be installed and updated in a central location. Users will automatically see the updates as they become available.

2.8 Un-install, re-install, and updates

B*efore attempting an uninstall, re-install or update, always back up the entire SpectrumSCM directory and all the project database folders.*

WARNING - A complete uninstall or re-install will remove the entire contents of the SpectrumSCM installation folder and the system and project databases. All users and projects will be deleted. Be sure this is really what you want to do. Just in case, it is wise to perform a complete backup before an uninstall/reinstall operation.

In SpectrumSCM, an install/update can be used to

- Completely re-install the same version of the product on a machine where it has previously been installed. To do a re-install, you uninstall the previously installed product, then reinstall, either into the same directories as used before OR into a different set of directories.
  NOTE: Always back up the entire SCM directory and all the project database folders in case any issues arise.
- Install an updated version of SpectrumSCM (a new release, fix, etc.) that does not involve database changes. **An update only updates the program executables and libraries, updating does NOT overwrite the SpectrumSCM system and your project databases.**
  NOTE: Always back up the entire SCM directory and all the project database folders in case any issues arise.
- When a new release of the SpectrumSCM software (for example, release 2.0) requires changes to the SpectrumSCM data base schema, the **Evolve** function is included to update the schema, leaving the data base contents intact. When this is required, detailed instructions will be included in the release's README file.
  NOTE: Back up the entire SCM directory and all the project database folders before beginning this process, just in case!

If you are having problems with an install, update or evolve, contact SpectrumSCM technical support. You may have to uninstall and then re-install if all fails. **This is why you always back up the entire SCM directory and all the project database folders before you begin such an operation.**

2.8.1 Update / Evolve the SpectrumSCM Server, UI or Web pages

Update
To make changes to the installed packages, you can use the configuration wizards described in Chapter 3 or rerun the installation process. This is useful when installing a new release or to restore the SpectrumSCM files to their original state.

- Rerun the installation from download or CD.
  - Progress thought the opening screen and licenses agreement.

- On **"What to Install"** select the component you wish to upgrade (server, UI, or web pages) and click **Next**

If the installation program detects that the component is already installed on the system, the "Verify Product Update" screen will be displayed. At this point the administrator can choose to update the component and all files associated with that component will be updated. With an update, no database changes will be made – the database will remain unaffected.

Evolve
When a new release of the SpectrumSCM software requires changes to the SpectrumSCM database schema, the **Evolve** function is used to update the schema, leaving the database contents intact. When this is required, detailed instructions will be included in the release's README file.

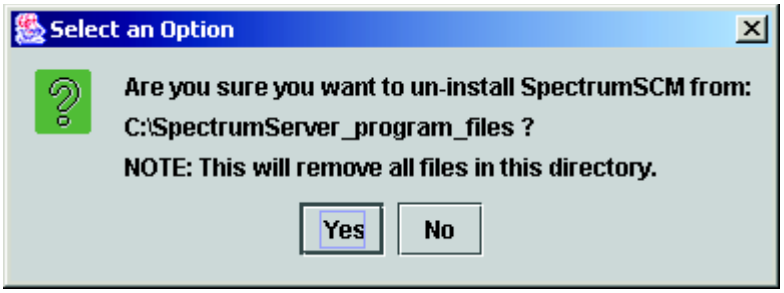
Uninstall the SpectrumSCM server

- In a Windows environment, from the command prompt window
  - execute the command **<directory in which the server was installed>\bin\uninstall.bat**
- In a Unix or Linux environment,
  - **cd** <directory in which the server was installed>/bin
  - execute the command **uninstall**

WARNING: ***This will delete all files associated with SpectrumSCM, including the database of project information. Before doing so, always back up the entire installation directory and all project database folders if you do not want to lose this information.***

You will be prompted to confirm that you want to uninstall the server.

WARNING: This will uninstall ALL FILES in the directory, all server and UI components from Click Yes to continue.



The uninstall is confirmed:

2.8.2 Uninstall the SpectrumSCM UI

- In a Windows environment, **In a Windows environment**:
  - START – Programs – SpectrumSCM UI – Uninstall

  or
  - from the command prompt window execute the command <directory in which the UI was installed>\bin**uninstallUI.bat**
- In a Unix or Linux environment,
  - **cd** <directory in which the UI was installed>/bin and
  - execute the command **uninstallUI**

  or
  - <UI install directory>/bin**/uninstall**

You will be prompted to confirm that you want to uninstall the UI. Click **YES** to continue. Confirmation will be displayed:

NOTE: Uninstalling the UI from a client machine will NOT impact the server or the database.

2.8.3 Uninstall the SpectrumSCM Web Pages / applet

- Delete the directory into which the web pages were installed.

or

- Rerun the installation from CD or download.
  - Progress through the opening screen and licenses agreement.
  - On **"What to Install"** select the SpectrumSCM Web Pages and click **Next**
  - If the installation program detects that web pages are already installed on the system, the "Verify Product Update" screen will be displayed. At his point the administrator can choose to uninstall the web pages.

2.9 SpectrumSCM Security Features

SpectrumSCM leverages the Java™ Security Model and Security Extensions to offer a variety of security features to protect the server, clients, and communications. These features fall into two groups, access control and communications security.

2.9.1 Access Control

SpectrumSCM employs a traditional account-based access model. The SpectrumSCM administrator role is responsible for creating user accounts. These accounts are protected by a login/password pair that must be provided when a user logs into the application. This is the default application security model, additional Access Control is configured through the server configuration wizard (or by editing the file **<directory in which the server was installed>**/SCM_VAR//etc/security/accessControl).

2.9.2 Location Control

SpectrumSCM provides an additional level of security based on the user's workstation's hostname (or IP address if unavailable). A user can be restricted to logging into the application from specific hosts. This feature is called **Location Control**; to enable it a "doAccess" line must appear in the accessControl file followed by "access" lines specifying allowed user/workstation combinations:

```
doAccess
        access  user1   workstation1
        access  user2   workstation2
etc.
```

With location control turned on only those users specified can log into the SpectrumSCM system. Even valid users attempting to login from workstations other than those specified in the accessControl file will be denied, *even if they supply a valid password*

2.9.3 Unauthenticated Commandline Access (single sign-on)

SpectrumSCM provides a UNIX-style command line interface for accessing many of its features, however as mentioned above the default security scheme would require a login and password for each server access. This may prove to be unnecessarily tedious when typing in a sequence of commands or incompatible for some activities (automated checking out of files by a nightly build script). This situation also comes up in the general world with people accessing many different IT systems and applications and has become known as **Single Sign-On**.

SpectrumSCM provides a feature called **Unauthenticated Commandline Access** to *relax* security, to allow unauthenticated command line access by specific users at specific workstations. Administrators should exercise caution when configuring this feature, and use it sparingly, if at all, considering all security ramifications.

Basically what single **"sign-on/unauthenticated access"** does is move the access control responsibility to the operating system/work-station level. Once a user has successfully logged in to the operatingsystem/work-station, that login information is what is then used to access the individual applications such as SpectrumSCM.

To enable this feature a "doUnauth" line must appear in the accessControl file followed by "unauth" lines specifying allowed user/workstation combinations:

```
doUnauth
    unauth user1 workstation1
    unauth user2 workstation2
etc.
```

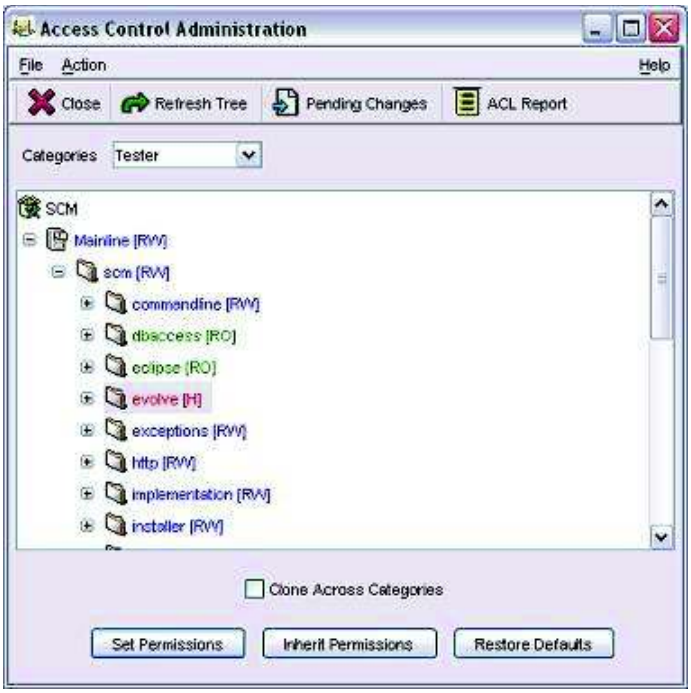
Users logging in to the UI or executing command line functions from their corresponding workstations as configured in the accessControl file will not be required to provide a password since that verification has already been performed by the operating system.

Administrators should exercise caution when configuring this feature, since if access to the workstation is not tightly controlled (ie access cards, screen locks etc) inappropriate accesses might occur.

NOTE/CAUTION !: Whereas Location Control tightens security, Unauthenticated Commandline Access could be viewed as relaxing security. In addition, Location Control takes precedence over Unauthenticated Commandline Access.

2.9.4 Access Control Lists

Access control in SpectrumSCM can be applied at the branch, directory and file levels. Controls are established for particular categories of users, instead of at the user level directly. This means that controls can be immediately established for all users assigned to a particular role. For instance, users assigned to a Development or Testing role may not have write access to the documentation directories or access to the requirements and design documents themselves.



In this example, users assigned to the Tester role have read-only access to the dbaccess and eclipse directories, and no access at all to the evolve directory. There are three modes that describe the level of access to repository resources:

- Read-Write [RW]
- Read-Only [RO]
- Hide [H]

When assigning Access Controls to a particular role, an already established set of controls can be used as a template for the new role. To use an already defined ACL template, select the "Inherit Permissions" button at the bottom of the screen and select an existing role to use as a template. Default access can be restored for any selected category by pressing the "Restore Defaults" button. All mode changes remain unimplemented until the "Set Permissions" button is pressed. Changes in ACL settings are highlighted with an "*" next to each repository element that has been changed.

2.9.5 Communications Security

SpectrumSCM provides a means to protect its communications so that assets may be checked out, modified, and checked in securely. By default, SpectrumSCM operates in an open mode, which is generally acceptable for use on a corporate intranet. This mode is the most efficient and appropriate for a majority of installations.

However, it may be necessary to use SpectrumSCM across an uncontrolled, insecure network (such as the Internet). In this situation, SpectrumSCM should be configured to protect its communications, which is accomplished via SSL (Secure Socket Layer, a standard developed by Netscape and approved by the Internet Engineering Task Force as a standard), or SSH (Secure Shell). Secured communication is not accomplished without a price - overall responses will be slower due to additional encryption/decryption processing at both ends of the connection. In addition, the administrator must obtain an SSL key and configure SpectrumSCM accordingly for SSL.

Once the administrator has obtained an SSL key, the configuration file must be edited to use it, this is done through the server configuration wizard or by directly editing *SERVER INSTALL DIRECTORY/SCM_VAR*/etc/scm.properties. The last section of the file pertains to SSL; scm.ssl.inUse should be set "true" and the other properties, particularly the SSL keystore (where the SSL key is stored) and the password that protects it must be provided.

Once the server has been properly configured, the SpectrumSCM clients may connect by supplying the SSL option. Turning on the SSL option is performed through the UI Configuration Wizard or by supplying **-ssl** on the command line. *See Chapter 3 for details.*

For secured communications using SSH, the server must be configured properly and the client side tunnel must be activated. To setup SSH on the server, modify the scm.properties file and set the following attributes as follows:

```
java.rmi.server.hostname              localhost
java.rmi.server.userLocalHostname     true
scm.port                              1099
scm.rmi.portnumber                    XXXX (where XXXX is some unused port)
scm.transport.portnumber              1101 (or any other unused port)
```

These entries tell the server to respond to client side connection requests using the machine name "localhost" and they also configure the port numbers to be used for the RMI channel, transport layer and registry port numbers.

On the client side, the SSH tunnel must be established via the command line and then the GUI will be able to connect to the server. The SSH command should look like the following:

```
ssh –N –v –L1099:server-ip:1099 –LXXXX:server-ip:XXXX –L1101:server-ip:1101
–l login server-ip
```

where "server-ip" is equal to the IP address of the host and XXXX is the port number assigned to the RMI channel described above.