

*Statemate*<sup>®</sup>



**ModelChecker  
&  
ModelChecker  
Plus**

**Release 4.6.1**

**Installation  
Guide**



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## Contacting IBM Rational Software Support

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For contact information and guidelines or reference materials that you need for support, read the [IBM Software Support Handbook](http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html) (<http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html>).

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Voice support is available to all current contract holders by dialing a telephone number in your country (where available). For specific country phone numbers, go to <http://www.ibm.com/planetwide>.

Before you contact IBM Rational Software Support, gather the background information that you will need to describe your problem. When describing a problem to an IBM software support specialist, be as specific as possible and include all relevant background information so that the specialist can help you solve the problem efficiently. To save time, know the answers to these questions:

What software versions were you running when the problem occurred?

Do you have logs, traces, or messages that are related to the problem?

Can you reproduce the problem? If so, what steps do you take to reproduce it?

Is there a workaround for the problem? If so, be prepared to describe the workaround.

# *Installation on Windows*

## 1 Installation on Windows

### 1.1 Before Installing

The ModelChecker and ModelCheckerPlus both support Windows 2000, and Windows XP. They also require an existing Statemate 4.6.1 installation.

You will need “ModelChecker” and/or “ModelCheckerPlus” feature licenses from IBM Rational installed to use these plugin packages.

#### **Platform Requirements**

##### **Hardware Requirements**

Computers that are configured to run Statemate are also ready for the ModelChecker and ModelCheckerPlus, if the following requirements are met:

Pentium III or compatible CPU, 1.6GHz or faster recommended

At least 512MB of DRAM; 1GB or more recommended; you may also want to increase the amount of virtual memory to 2GB or more, by adding swap space using the system control panel.

No printing support needed

##### **Software Requirements**

Windows 2000 (any Service Pack), or Windows XP

Statemate 4.6.1

X Server (Solaris only)

Acrobat Reader (for online help)

Cygwin 1.5.21 (with required packages installed. See chapter 1.7)

##### **File Permissions**

The ModelChecker and ModelCheckerPlus are installed in the subdirectory “plugins” inside the Statemate main directory (%STM\_ROOT%); users do not need write permissions in this directory area.

##### **Disk Space**

You will need approx. 113MB for the ModelChecker and ModelCheckerPlus plugins (under %STM\_ROOT%/plugins).

The actual disk usage will also depend on the characteristics of the disk’s filesystem, esp depending on block sizes (many of the installed files are very small). Especially on a FAT partition, you may need up to 700 MB of free space for the complete installation.

## 1.2 Installation Options

Like Statemate, the installation can either be done completely onto one machine, or as a “client-server” configuration. If you have Statemate installed as “Client-Server”, you should also install the ModelChecker and ModelCheckerPlus in the same way (Important: read the additional constraints in the “Client-Server installation” section).

The installation options differ in the following way:

**Standalone:** The MC plugins are installed on the target machine. Be sure, that a valid Cygwin Runtime Environment exists on the target machine.

**Server:** The Statemate MC plugins are installed. You need to perform at least one client installation afterwards.

**Client:** The MC plugin’s startup files on the corresponding server are modified accordingly. The Statemate server installation needs to be visible with write permissions, at *exactly* the same drive/path that users will use.

## 1.3 Installation Procedure

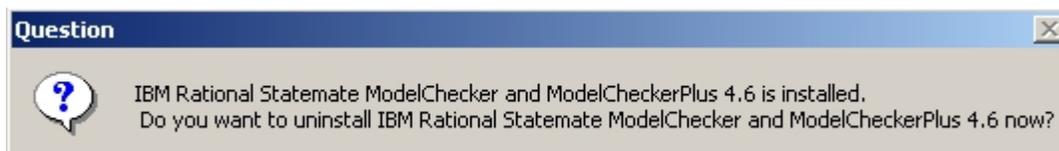
To install the “ModelChecker and ModelCheckerPlus”, you have to have administrator rights. If you are using antiviral software like NAI (formerly McAfee) VirusScan, please disable it before installing. Also exit all other programs.

### Installing the ModelChecker and ModelCheckerPlus Plugin

The installation “Setup” program will guide you through all steps. If you want to install Cygwin manually, refer to the next section (e.g. you are already using Cgwin on your computer, or doing a “client” installation).

Insert the ModelChecker and ModelCheckerPlus CD-ROM into your drive. If the installation does not start automatically, run the `setup.exe` on the CD.

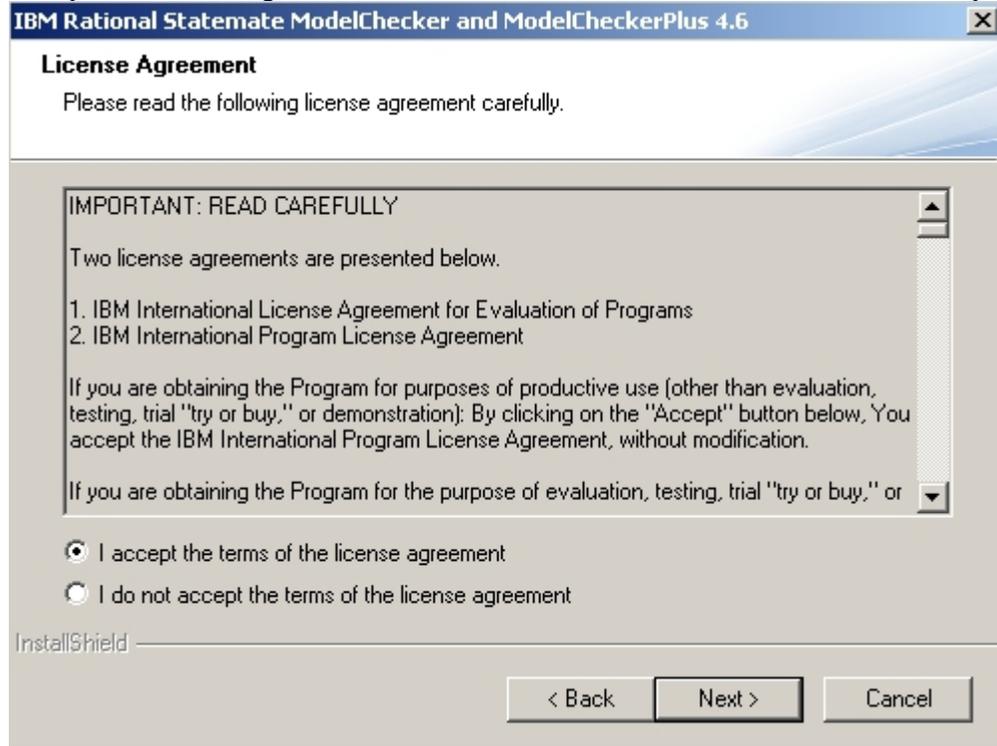
When there is an installed previous ModelChecker and ModelCheckerPlus for the IBM Rational Statemate 4.6 release, you will be asked to uninstall this previous version first.



Please start the setup afterwards again to proceed with the installation of MC for Statemate 4.6.1.

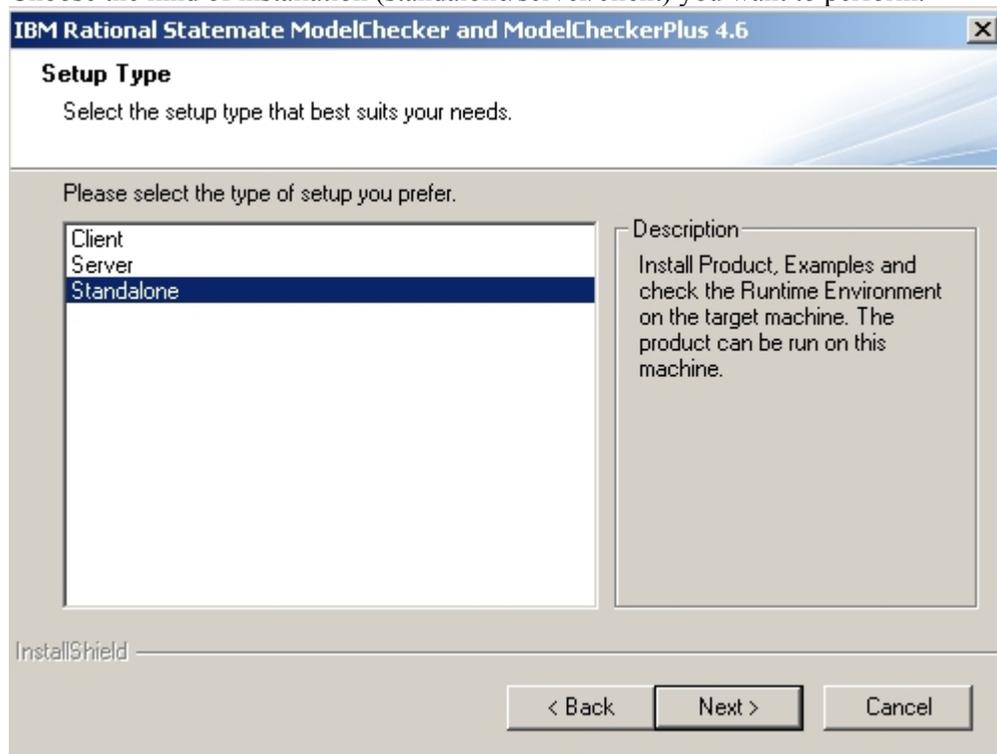
At the welcome window, click **Next>** to continue.

Accept the License Agreement in order to install the IBM Rational StateMate MC plugins.



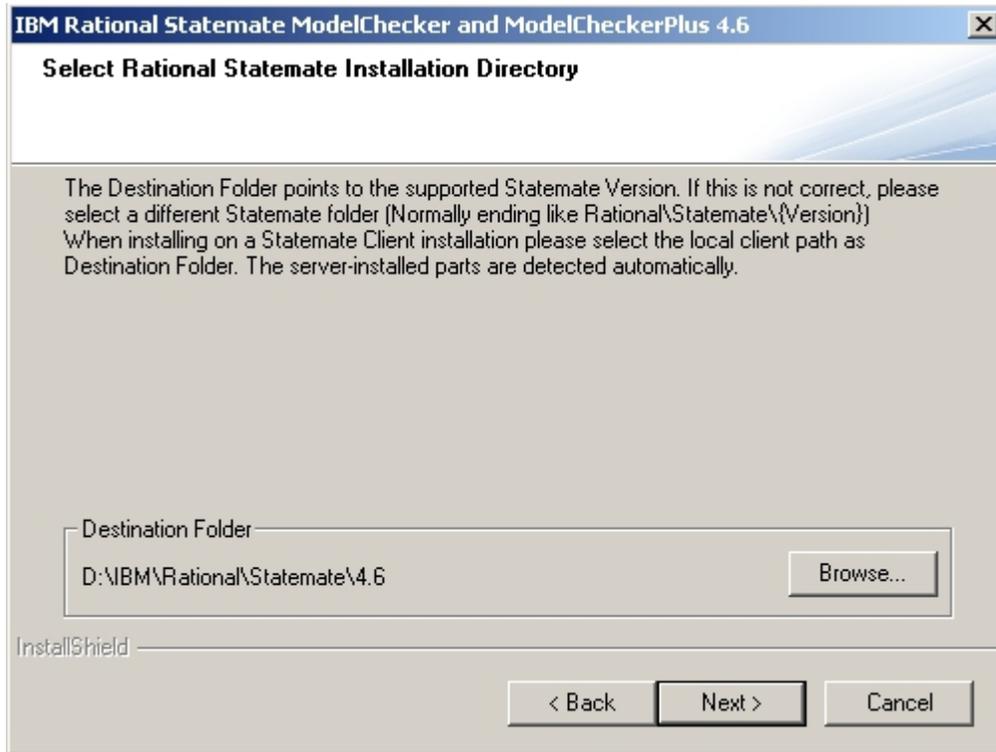
Click **Next>** to continue.

Choose the kind of installation (standalone/server/client) you want to perform.

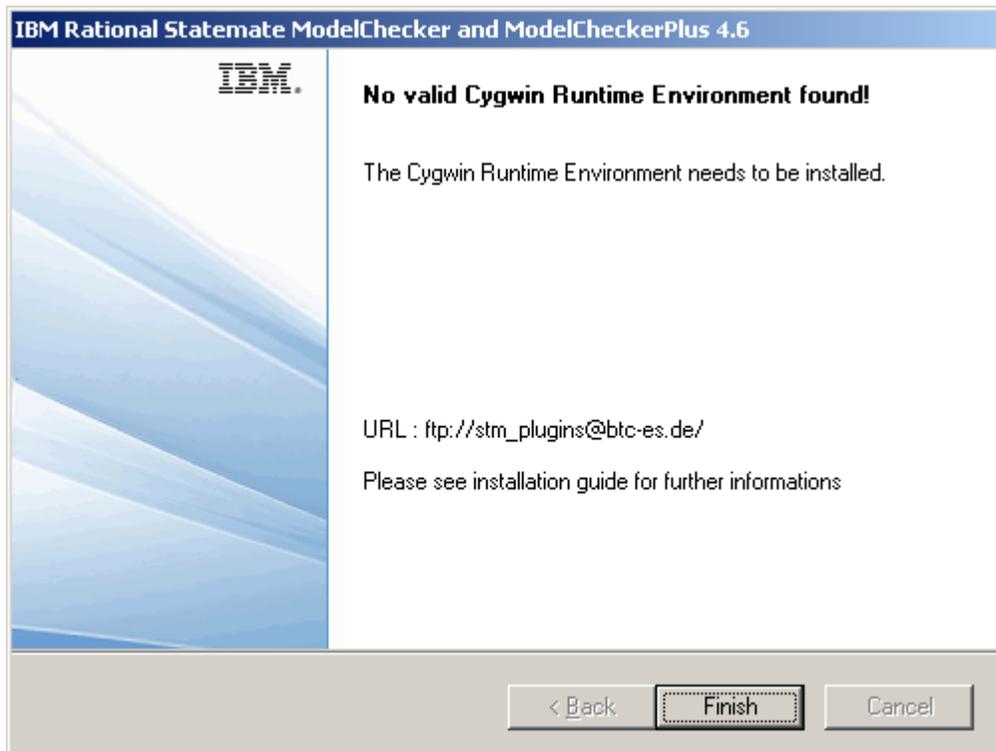


Click **Next>** to continue.

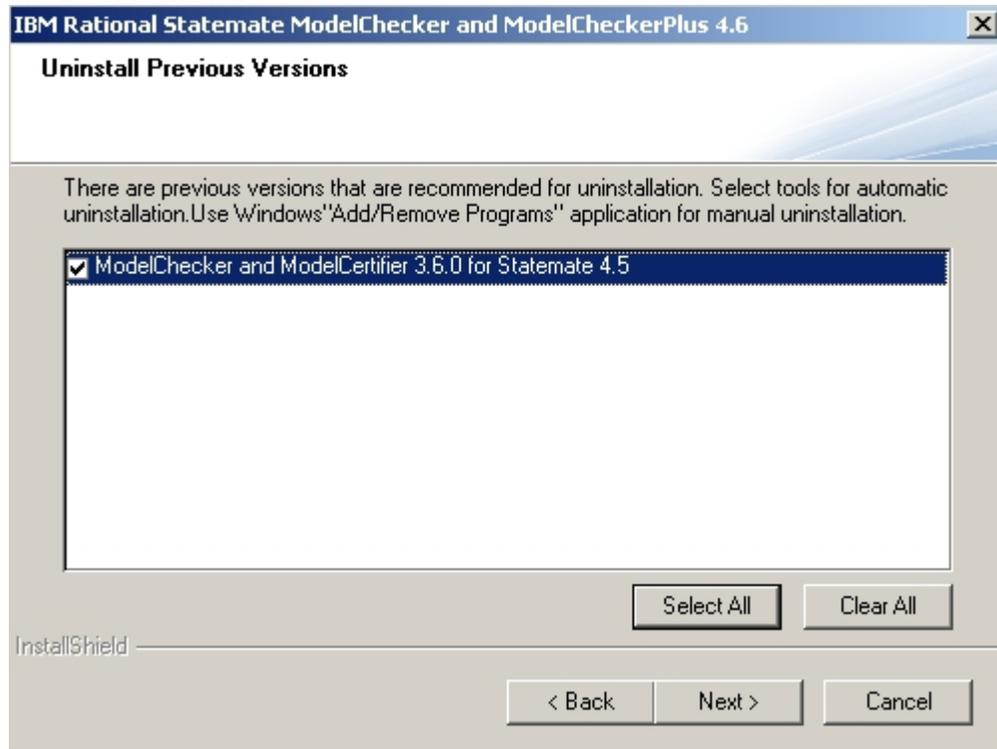
Confirm that the right StateMate installation directory was detected or change the path to your StateMate installation. Then click **Next>** to continue.



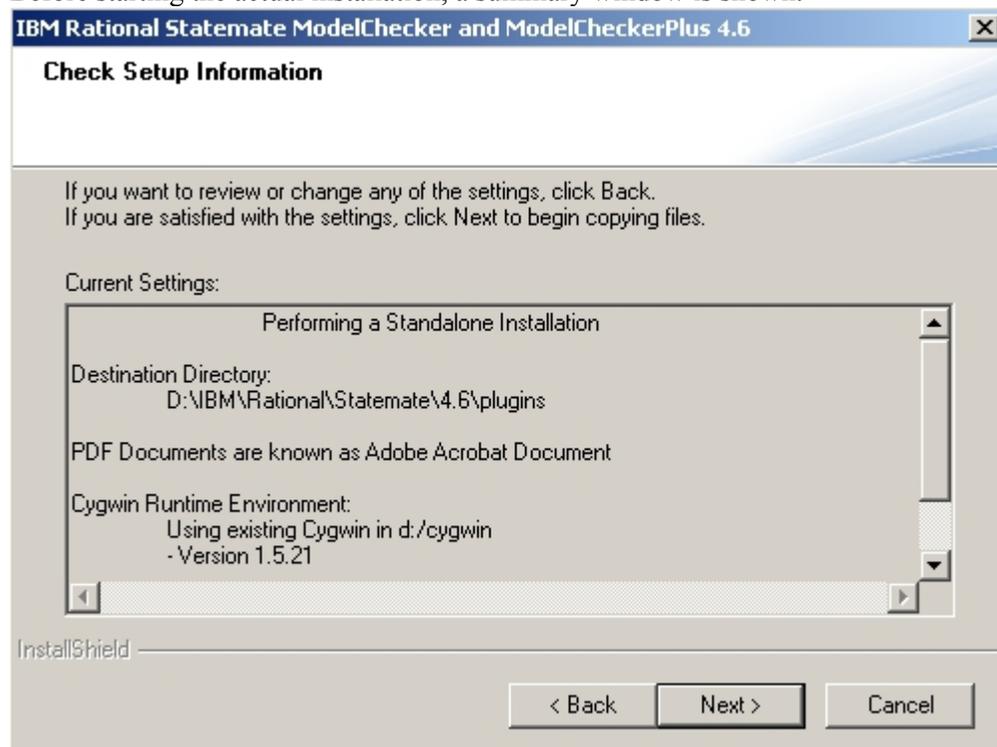
If no cygwin runtime environment could be found on your system or the installed one is incomplete or too old, the setup will abort with an appropriate message. See section 1.7 below to get installation information for the cygwin runtime environment.



When you have installations of previous MC releases you have to decide if they are to be removed prior to this new installation.



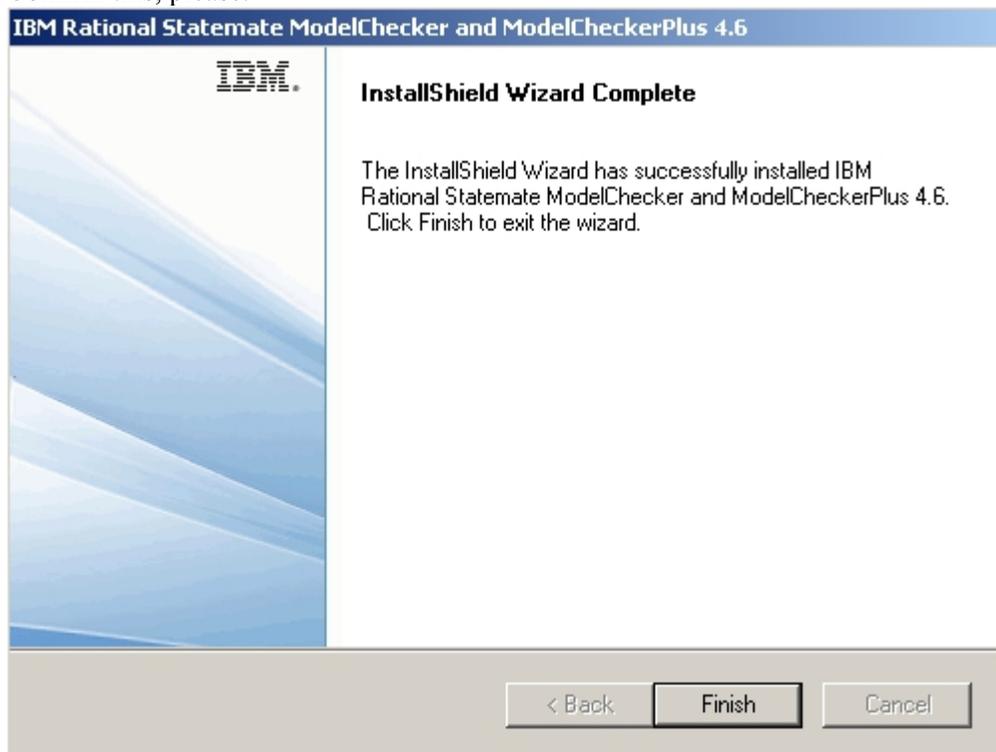
Before starting the actual installation, a summary window is shown.



Here you should check if the automatic detection worked correctly and found the right Destination Directory. If you want to change some installation parameter please go **<Back** and modify the settings, otherwise you may proceed by clicking **Next>** .

After that, the installer will start copying all necessary files. During this process, there may be warnings about "read only file detected". Confirm overwriting these files by clicking on **Yes**.

When all installations are done, click **Finish** to return to Windows. It may also happen that the setup program will ask you to restart the computer at the end of the installation, or to logout and login again. Confirm this, please.



The StateMate ModelChecker/ModelCheckerPlus plugin is ready to be used (when a license is available).

## 1.4 Recording an ModelChecker/ModelCheckerPlus Installation

At the top level of your installation CD you will find a script file `Setup_Record.cmd`. Execute

```
Setup_Record.cmd C:\Temp\MC_logFile.iss
```

in a command shell with `MC_logFile.iss` being a (new) file name. Then follow the installation instructions. After successful installation, `MC_logFile.iss` contains all necessary information to replay the installation.

## 1.5 Replaying an ModelChecker/ModelCheckerPlus Installation without User Interaction

At the top level of your installation CD you will find a script file `Setup_Playback.cmd`. Execute

```
Setup_Playback.cmd C:\Temp\MC_logFile.iss C:\Temp\MC_setup.log
```

in a command shell with `MC_logFile.iss` being the file name of a recorded MC installation and `MC_setup.log` being a (new) file.

The installation recorded in `MC_logFile.iss` will be repeated while all installation steps are logged in the provided log file. Examine this log file to check that the auto-install was successful.

## 1.6 “Client-Server” Installation (Local Cygwin)

The ModelChecker/ModelCheckerPlus plugin can be installed in a client-server fashion like Statemate, if you follow these rules:

- The main Statemate directory needs to be visible in exactly the same (mapped) drive and path on all client machines.
- You need to install the “Server” ModelChecker/ModelCheckerPlus option onto the shared server file system first. After that, do at least one client installation.

The required Cygwin Runtime Environment must be installed on the Client.

## 1.7 Manual Installation of the Cygwin Runtime Environment

If an appropriate installation of the cygwin runtime environment is found (for example from previous ATG or ModelChecker/ModelCheckerPlus installations) this one will be used automatically.

If you have already an installed cygwin runtime environment that is incomplete or too old to be used with MC, you have two options: either the existing cygwin version will get updated, or you select a new installation directory for the installation of MC’s cygwin. In the latter case, MC’s cygwin will become system default (registry entries will refer to your new installation).

### Download Cygwin

An appropriate and tested cygwin runtime environment can be downloaded from

[ftp://stm\\_plugins@btc-es.de/Windows](ftp://stm_plugins@btc-es.de/Windows)

```
User name: stm_plugins  
Password : !pp431qx
```

## Installation

Download the CygWinInst.zip file, extract the content and call `setup.exe`. The Cygwin software should be installed in `c:\cygwin`, but any path that does not contain spaces is sufficient. Users should have “full control” permissions in the subdirectories “tmp”, “var” and “home”. The rest of Cygwin can be read-only.

## Disk Space

You will need approx. 32MB for the Cygwin Runtime Environment (usually in `c:\cygwin`),

## Cygwin Questions

### Cygwin Package Information

In the case that you want to use an already existing cygwin installation newer than cygwin 1.5.21, or in the case that you want to replace the ModelChecker/ModelCheckerPlus cygwin installation by an upgrade, you need to ensure that you select the packages required by MC. With the MC installation you get the following packages by default (output in a cygwin bash from `/bin/cygcheck -c`) :

Package	Version
update-info-dir	00423
ash	20040127
base-files	3.7
base-passwd	2.2
bash	3.0
coreutils	5.97
crypt	1.1
cygutils	1.3.0
cygwin	1.5.21
findutils	4.3.0
gawk	3.1.5
grep	2.5.1a
libiconv2	1.9.2

Package	Version
libintl	0.10.38
libintl1	0.10.40
libintl2	0.12.1
libintl3	0.14.5
libncurses8	5.5
libpcre0	6.6
libpopt0	1.6.4
libreadline6	5.1
make	3.81
pcre	6.6
rebase	2.4.3
sed	4.1.5
termcap	20050421

The dependency from X11 runtime libraries that existed in previous releases has been removed.

### Using an Existing Cygwin Installation

If you already have the Cygwin environment installed on your computer, you may keep it to use it with the ModelChecker/ModelCheckerPlus plugin, although this is not officially supported.

You need at least release 1.5.21 of the Cygwin core files. Release 1.5.21 is installed with the downloaded version explained above.

### Required Extension

The default Cygwin 1.5.21 has been extended by further free open-source libraries as compiled DLLs. These libraries are: `libxml`, `libxslt`, `libexslt`, and `iconv`.

In previous releases, these DLLs have been stored in `<STM_ROOT>/plugins/stve<no>/bin`. You may copy them from old installations.

**Note:** if you install or re-install cygwin into a directory that is different from the previous installation performed with ModelChecker/ModelCheckerPlus and/or ATG, then the plugins will not run any more if you don't adapt the environment variable `OSC_CYGWIN_ROOT`.

## Getting the Cygwin Source Code

The setup sources of the expected CygwinRuntime Environment can be found under the following URL:  
[ftp://stm\\_plugins@btc-es.de/Windows](ftp://stm_plugins@btc-es.de/Windows)

## How do I uninstall all of Cygwin?

The installation CD-Rom of previous releases and the [ftp://stm\\_plugins@btc-es.de/Windows](ftp://stm_plugins@btc-es.de/Windows) area contain an uninstall program for cygwin, called `Uninstall_Cygwin.exe`. This program will detect the installed cygwin version and its directory. You may choose to remove the detected cygwin installation. For further instruction refer to the Help available in `Uninstall_Cygwin.exe`.

## Cygwin Setup cannot find Files to Install

If the Cygwin setup program cannot find the files to install, there are two known reasons:

You entered the wrong “Local package directory” path.

If you downloaded the Cygwin runtime environment as an archived file, and unpacked it to create a CDROM, please re-check the options of your CD burning program. Support for a “Joliet” filesystem must be enabled, because the Cygwin files use long names with multiple dots, e.g. “`bash-2.08-pl8.tar.gz`”. Also check that your burner software actually accepts multiple dots, and does not convert them to other characters.

## Bad/Missing /etc/passwd and /etc/group Files

The Cygwin setup program usually automatically creates working `passwd` and `group` files. It may happen that this installation step silently fails. In this case, you will observe strange behaviors when executing an analysis or proof task:

- \* The result is usually wrong, e.g “0 of 12 reachable”
- \* And there are “signal 11” error messages in the message area of the MC.

To solve this, you have to run two commands that recreate the `/etc/passwd` and `/etc/group` files of Cygwin:

1. Log in with local administrative rights
2. Run the “Cygwin Bash Shell”: Start menu → Programs→ Cygnus Solutions→ Cygwin Bash shell
3. Execute these commands:

```
mkpasswd -l >/etc/passwd (+return key)
mkgroup -l >/etc/group (+return key)
```
4. Now exit the shell window by typing `exit` (+return key).

This procedure will recreate the `/etc/passwd` and `/etc/group` files with information on all local accounts. If you prefer to have the user information from the whole Windows domain, use the Parameter “`-d`” (domain) instead of “`-l`” (local).

# Troubleshooting on Windows

## 2 Troubleshooting on Windows

### Cannot connect to X server ....

Problem: The ATG cannot open it's Windows; the message "Cannot connect to X server" appears in the console window. On Windows platforms, the dependency from an X-server has been removed with release version ATG 3.5. On Solaris, ATG needs X11 as Statemate does.

### Username on Windows

See page 89 of the "Administrator's Guide": "User Names on Windows Systems".

We strongly discourage using blanks in user's login names. You should also avoid capitalized letters.

### No Reaction when Clicking on the new Tool Icons

If there is no reaction at all when you click on the ModelChecker or ModelCheckerPlus icons in the Statemate main window, maybe `\winnt\System32\cmd.exe` is not in the default PATH of Windows.

Solution: Add `%windir%\System32` to the Statemate startup file (`run_stmm.bat`):

In your Statemate main directory, open the subdirectory `bin`. Edit the file `run_stmm.bat` in Notepad.

Find the line that begins with `SET PATH=`

Add the the following to the end of the line (do not use blanks):

```
;%windir%\System32;%windir%
```

Save the file and exit Notepad.

### Cannot find the file 'bash'

The cygwin shell, called 'bash.exe', is not found. The path to the bash.exe is fixed during the installation. Sources for not finding the bash.exe may be

You are in a client/server installation. The client cygwin installation has to be in the same drive/path on all clients.

You removed or renamed manually your cygwin installation.

You reinstalled cygwin into a different directory.

The path to the expected cygwin installation can be found in

```
%STM_ROOT%\plugins\stve\bin\cygwin\stm_stve.bat
```

for the ModelChecker, and for the ModelCheckerPlus in

```
%STM_ROOT%\plugins\stve\bin\cygwin\stm_stve_CF.bat
```

in the setting for `CYGWIN_ROOT`. If there exists a cygwin installation at a different place you can manually exchange the setting for `CYGWIN_ROOT`.

If you want to de-install an old or corrupted cygwin see section [How do I uninstall all of Cygwin](#) below. Afterwards install cygwin in the expected CYGWIN\_ROOT (see [Running the Cygwin Installer Manually](#)).

### “Failed to allocate heap size of .....” Message

If you see a message similar to this:

```
C:\IBM\Rational\Statemate\4.6.1\plugins\stve\bin\cygwin\PowerProver.exe:
*** 2. unable to allocate heap, heap_chunk_size 1342177280, Win32 error 8
ModelCheckerPlus return=1
press return to exit ...
```

ModelChecker/ModelCheckerPlus up to release 2.3 came with a cygwin version that required a registry entry to be able to allocate more than 385 MB. This limitation is not present any more, but it may be necessary to remove or increase old still existing registry entries in your installation. Search for heap\_chunk\_in\_mb in the HKEY\_CURRENT\_USER/Software/Cygnus Solutions/Cygwin tree in the registry.

### Tool fails to start

**Message Area shows text like “cygheap\_fixup\_in\_child: Couldn't reserve ...”**

A message, stating something like: "cygheap\_fixup\_in\_child: Couldn't reserve ..., Win32 error 487" indicates a rebase error. It is caused by internal memory management problems and can be fixed with the **rebase** tool. This tool is installed with the cygwin runtime environment.

Recommended steps:

1. start cygwin
2. call: cd /bin
3. call: rebaseall
4. call: copy cygwin1.dll cygwin1.dll.rebased
5. call: rebase -b 0x60000000 cygwin1.dll.rebased
6. call: copy cygwin1.dll cygwin1.dll.orig
7. call: exit

Go on further, with the Windows Explorer:

8. delete cygwin1.dll
9. rename cygwin1.dll.rebased to cygwin1.dll

This should fix the problem. If it still persists, copy cygwin1.dll.orig to cygwin1.dll and perform the above steps again.

Modify step 5 by increase the value after **-b** in each iteration by 0x100000. So the next call to rebase should be

```
rebase -b 0x70100000 cygwin1.dll.rebased
```

and so on.

If the problem persists after some iterations of this procedure, please call the OSC support.

## **Problems with Antivirus Software (esp. McAfee Virusscan)**

Users have reported that NAI (formerly McAfee) VirusScan for NT (and others?) is incompatible with Cygwin. This is because it tries to scan the newly loaded shared memory in `Cygwin1.dll`, which can cause `fork()` to fail, wreaking havoc on many of the tools. (It is not confirmed that this is still a problem, however.)

There have been several reports of NAI VirusScan causing the system to hang when unpacking `tar.gz` archives. This can be an issue during Cygwin's setup. The only known workaround is to disable your antivirus software during setup.

Some users report a significant performance hit using Cygwin when their anti-virus software is enabled. Rather than disable the anti-virus software completely, it may be possible to specify directories whose contents are exempt from scanning. In a default installation, this would be ``C:\cygwin\bin'`. Obviously, a hostile non-Cygwin program could exploit this, so do this at your own risk.

# *Installation on Solaris*

## 3 Installation on Solaris

### 3.1 Before Installing

The Solaris version of the ModelChecker and ModelCheckerPlus can be used on SUN Solaris machines with a SPARC V10 compatible CPU. They also require an existing Statemate (Version 4.6.1 or later) installation.

You will need “ModelChecker” and/or “ModelCheckerPlus” feature licenses from IBM Rational installed to use these tools.

#### Platform Requirements

##### Hardware Requirements

Computers that are configured to run Statemate are also ready for the ModelChecker and ModelCheckerPlus, if the following requirements are met:

350Mhz UltraSparc or faster CPU recommended.

At least 512MB of RAM; 1GB recommended; you should also have 1GB or more swap space.

No printing support needed

##### Software Requirements

Solaris 2.10 with X11 window system (CDE)

Solaris “make” command

Acrobat Reader (for online help; installed with Statemate)

Shared libraries:

```
libcharset.so.1.0.0
libexslt.so.0.8.13
libiconv.so.2.2.0
libxml2.so.2.6.27
libxslt.so.1.1.19
```

These libraries can be taken from

[ftp://stm\\_plugins@btc-es.de/Solaris](ftp://stm_plugins@btc-es.de/Solaris)

```
User name: stm_plugins
```

```
Password : !pp431qx
```

## Permissions

The ModelChecker and ModelCheckerPlus are installed in the subdirectory “plugins” inside the Statemate main directory (\$STM\_ROOT);

You **must** have write permissions to create the \$STM\_ROOT/plugins directory if it is not already present, and to perform the installation under this plugins directory.

Users do not need write permissions in this directory area during applications of ModelChecker and ModelCheckerPlus.

## Disk Space

During installation, you will need approx. 300MB in the \$STM\_ROOT/plugins directory.

After installation, the ModelChecker and ModelCheckerPlus will use about 150MB in \$STM\_ROOT/plugins.

## 3.2 Installation Procedure

Mount the installation CDROM

Change the directory to the <mount point> (or, if it exists, to <mount point>/PLUGIN/)

Set the environment variable STM\_ROOT to the location of your Statemate installation.  
(e.g. csh: `setenv STM_ROOT /opt/local/stmm4.6.1/SOL` )

Run the script INSTALL.SH. This script will first check your environment, use \$STM\_ROOT to locate your Statemate installation, and then install all needed files. On your console window, you will get messages similar to this:

```
Setting ENVIRONMENT-variable $OSC_ROOT to /opt/local/statemate/stmm4.6.1/SOL/plugins
```

```
Statemate found:/opt/local/statemate/stmm4.6.1/SOL/bin/stm
```

```
Checking for Statemate Version 4.6.1 ...
```

```
This Statemate 4.6.1 Build No. [...]
```

```
creating /opt/local/statemate/stmm4.6.1/SOL/plugins/stve
```

```
unpacking archive ...
```

```
creating plugin startup files ...
```

```
[...]
```

```
OK
```

```
----
```

```
Updating file permissions ...
```

```
Installation completed.
```

You will now be returned to you shell command prompt. The installation is completed, and you can unmount and eject the CDROM.

# *Troubleshooting on Solaris*

## 4 Troubleshooting on Solaris

### Strange Error Messages when Opening/Compiling any Design

Problem:

When opening a profile or compiling a design in the ModelChecker or ModelCheckerPlus, you always get an “internal error” messages.

On your console/message window, you see “Error 43”

This error sometimes occurs when you have set `STM_ROOT`, `STM_CLI_FLAGS`, or other Statemate-specific environment variables in your shell’s profile ( `.profile`, `.cshrc`, `.tshrc`, `.login` and/or `.bashrc`). Comment out all `STM_...` entries, log in again and rerun Statemate.