Software Installation Guide

Accenture StormTest Development Center

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Web: http://www.accenturestormtest.com

Contents

1 Preface

1.1 Accenture StormTest

Accenture StormTest Development Center is the leading automated test solution for digital TV services. It is designed to reduce the cost of getting high quality digital TV services to market faster.

StormTest Development Center greatly reduces the need for time-consuming, expensive and error-prone manual testing and replaces it with a more accurate and cost-effective alternative. It scales easily to large numbers and types of devices and integrates with existing infrastructure to give much greater efficiency in testing. It can be used to verify and validate services on a virtually every piece of consumer premises equipment (CPE), from set-top boxes to games consoles and from iPads to Smart TVs. It has been specifically designed to meet the needs of developers and testers of these CPE devices and the applications which run on them.

StormTest Development Center consists of:

- A choice of hardware units that can test 1, 4, or 16 devices. Each device under test can be controlled individually and independently and the audio/video from each device can be captured and analysed to determine the outcome of the test. The StormTest hardware supports capture of audio and video over HDMI interfaces and supports all HD resolutions up to 1080p. In addition, there is a hardware upgrade option for the 16 device tester that will allow native capture of UHD content.
- Server software that controls all the hardware and devices in the rack as well as managing a central repository of test scripts and a central database of test results.
- A Client API that allows test scripts to interact with the server software
- A number of graphical tools that allow the user to directly control devices connected to StormTest Development Center, to create and schedule tests to run and to view the results of those test runs.

Test scripts can be run from any location – the tester needs only a network connection to the StormTest server. Video and audio output from the devices under test can be streamed over this network to any location, allowing remote monitoring and control of testing, either within a company LAN or across a WAN. Alternatively, scheduled tests can run directly on the server, negating the need for maintaining a continuous network connection to the StormTest server.

1.2 About This Document

This document describes the installation and configuration of the StormTest Development Center software.

1.3 Who Should Read This Document

This document is targeted at the following groups:

- StormTest Development Center system installers.
- StormTest Development Center facility administrator.

1.4 Related Documentation

The StormTest Development Center user documentation set comprises of the following documents:

1) StormTest Developer Suite User's Manual
2) StormTest Programmer's Guide
3) StormTest Client API
4) StormTest Hardware Installation Guides (HV01, HV04, HV16)
5) StormTest Software Installation Guide
6) StormTest Server Monitor User's Manual
7) StormTest Administration Console User's Guide
8) StormTest Administration Tools User's Guide

The latest version of these documents can always be found on our support website, in the "StormTest Development Center Documentation Set" section: https://stormtest.zendesk.com/hc/en-us/sections/115000203169-StormTest-Development-Center-Documentation-Set

1.5 Acronyms

Acronym	Description
CPU	**Central Processing Unit**
FTP	**File Transfer Protocol**
IP	**Internet Protocol**
IR	**Infra Red**
LAN	**Local Area Network**
OCR	**Optical Character Recognition**
PC	**Personal Computer**
RAID	**Redundant Array of Independent Disks**
RPS	**Remote Power Switch**
STB	**Set Top Box**
USB	**Universal Serial Bus**
DUT	**Device Under Test**
NTP	**Network Time Protocol**

Table 1: Acronyms

2 Software Installation

2.1 Operating System Requirements

The StormTest platform is built to run on the Microsoft® Windows® family of operating systems. The StormTest server software is supported on Microsoft Windows 7, Microsoft Windows 8(.1), Microsoft Windows Server 2008 R2 and Microsoft Windows Server 2012. As the server PC is supplied by Accenture, it will always have a supported operating system installed on it.

The StormTest client (StormTest developer suite and the python client modules) is supported on the following operating systems:

- Windows 7 32 bit.
- Windows 7 64 bit.
- Windows 8 64 bit.
- Windows 8.1 64 bit.
- Windows 10 64 bit.

As of StormTest Release 3.2, support for Windows XP has been dropped. Clients connected to SD StormTest servers SHOULD still work on Windows XP, but XP specific bugs will no longer be fixed so all users are encouraged to move their client PCs to Windows 7 or greater.

StormTest Release 3.2.6 and higher will NOT install on Windows XP

As of StormTest Release 3.2.6, support for Windows Server 2003 has been dropped. StormTest Servers with the Windows Server 2003 OS will NOT be able to install any release later than 3.2.5. If you are in this position, please contact the StormTest Support team to arrange for an upgrade to your server.

2.2 Hardware Requirements

The StormTest client software has a minimum requirement of:

CPU: Intel® Core i5 or better
Memory: 4GB or more
Display: 1024 x 768 @ 32 bit colour depth
Video GPU: GPU supporting Direct3D version 10 or better, e.g.

- Nvidia® GeForce® 9xxx series or better
- AMD Radeon™ R600 or better
- Intel® HD Graphics

2.3 Software Architecture

Before installing the StormTest software, it is important to understand the software architecture.

Firstly, there are some terms used which need to be defined:

- **Facility** – A StormTest facility is a group of one or more StormTest racks. In almost all cases, these racks will be co-located.
- **Rack Server** – A StormTest server is a Windows Server PC that is running the StormTest server software, allowing tests to be run on up to 64 slots in parallel.
- **Configuration Server** – The StormTest configuration server (AKA 'config server') is the PC that has been designated to host the StormTest database, web server, subversion repository, configuration server software and the license server. Note that there is only **one** configuration server for each facility. All other StormTest servers connect to this server to retrieve configuration information.

  The configuration server may, or may not be a StormTest server. In a facility with only one rack, the single StormTest server will most likely also be the configuration server.

  In a facility with many StormTest racks, it is recommended to designate a separate PC to be the configuration server. This PC would be the single point of failure for the facility so it should not be in a StormTest rack and should be configured for maximum redundancy.
- **Client Daemon** – The Client Daemon is a service that runs on each StormTest server PC. It may also be installed on other PCs to spread the load when running test scripts. It accepts jobs submitted from remote clients, executes them and stores the results in the database. The client daemon service is required if remote test execution is to be used. See 2.7.
- **Configuration Server Service -** The configuration service runs on the configuration server to allow the StormTest server and the client test scripts to access the SQL database. Since it runs on the configuration server, there is only one configuration service per facility.
- **Watchdog Service –** This monitors the StormTest services and restarts them if they terminate.
- **OCR Server –** The StormTest OCR Engine.
- **StormTest Host Service -** The StormTest host service is responsible for running the StormTest server process and the OCR server process.
- **Scheduler –** The scheduler service. This is responsible for scheduling all test runs and interacting with the client daemons. There must be one instance of this installed at each facility.
- **License server –** The license server service. This allocates client and server licenses. There must be one instance of this installed at each facility.
- **Administration Console** – The administration console web application. This allows users to configure their StormTest facility.
- **Server Monitor Application**. The StormTest Server Monitor application. This allows the user to monitor the StormTest servers in the StormTest facility.

Each StormTest server that is delivered comes pre-installed and configured to function as a standalone StormTest facility.

During commissioning and installation, the necessary changes are made by the onsite engineer to move all the servers into a single facility.

2.4 Time Synchronisation Requirements

All StormTest servers in a facility and the StormTest Configuration server must be configured to be in the same time zone. They must also have their internal clocks synchronised. If this is not the case, the scheduler and results reporting may behave in unexpected ways due to the discrepancies between the servers.

The best way to achieve this time synchronisation is to sync all servers with an authoritative time server on the network using NTP (network time protocol). Configuring an NTP server is beyond the scope of StormTest configuration and your local IT support person should be able to aid you in doing this.

However, for situations where there are no NTP servers available on your network, at the very least all the StormTest servers should be synchronized to the clock on the Configuration server. This can be achieved by following these steps:

2.4.1 Enable NTP server on Configuration server

Follow these steps to allow the Configuration server to operate as an NTP server, serving its local hardware clock time. Please only follow these steps in consultation with StormTest support as editing of the registry may cause unintended consequences if the incorrect keys are edited or deleted.

1. Open the registry editor and navigate to **`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config`**.
2. Set the **AnnounceFlags** key to the value **5**.
3. Open **`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpClient`**.
4. Set **Enabled** to **0**.
5. Open **`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpServer`**.
6. Set **Enabled** to **1**.
7. Open a command window and execute:
   net stop w32time && net start w32time

2.4.2 Enable NTP client on each StormTest server

Each StormTest server must be told to synchronize with the Configuration server:

1. Open the registry editor and navigate to **`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters`**.
2. Set the **NtpServers** key to the value **cfgserver,0x1** where you replace ‘cfgserver’ with the fully qualified domain name for your config server, or the IP address.
3. Open **`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpClient`**.

4. Set **Enabled** to **1**.
5. Set **SpecialPollInterval** to be the number of seconds between requests from the machine to the config server for the current time. We recommend that this is set to decimal **900** (i.e. 15 minutes).
6. Open a command window and execute:
   net stop w32time && net start w32time
7. Force a resync by executing:
   w32tm /resync

2.4.3 Firewall requirements

The NTP protocol uses UDP on port 123, so you will need to ensure that this port is open between the StormTest servers and the StormTest Configuration server.

2.5 Obtaining the installers

All the StormTest installers can be downloaded from the StormTest Engage website. The URL for the Releases area is https://stormtest.zendesk.com/hc/en-us/sections/115000199625-StormTest-Development-Center

Within this page, click on the version that you require (there may be a number of maintenance releases on this page).

The installers available are:

- StormTest Server installer – to be used on each StormTest server and on the config server.
- StormTest Client installer – to be used on each StormTest users PC
- StormTest Admin Tools installer – contains the remote control trainer, so should be installed by any users responsible for adding new DUTs to the facility.
- StormTest Log Viewer installer – this installs the standalone StormTest log viewer. Can be installed freely by anyone interested in playing back logs generated by StormTest test runs.
- StormTest 3rd Party Tools installer – a collection of tools and redistributable files that needs to be installed on every StormTest server. These tools only change very rarely, so in most cases, this will only need to be installed once.

In addition to the above installers generated with each release of StormTest, there is also an installer for the StormTest Database. This is available from the support team if required. This will install:

- The supported versions of PostgreSQL and Subversion server
- An empty StormTest database and file repository

Once the StormTest Database is installed it **should not be uninstalled**, unless you wish to start again with a clean database.

2.6 Installation

When installing the StormTest server software, we consider two scenarios:

1. An upgrade where the existing installed version of StormTest is greater than or equal to 2.8.0 (for older releases, please contact support)
2. A fresh install where there was no previous installation of StormTest (or the previous installation has been completely removed).

2.6.1 Upgrade from version 2.8.x or greater

2.6.1.1 Creating a backup

All the existing data in the database and the existing tests in the test repository will be unaffected by the upgrade. However, we still recommend that a backup of the database is carried out before the upgrade.

Creating a backup is a two-part process. First, you must create a backup of the SQL database. Then you must backup the file repository. These two items are linked and must be backed up and restored together.

2.6.1.1.1 Backup the SQL database

To create a backup of the database, open a command window on your config server and execute:

```
pg_dump -i -h localhost -p 5432 -U stormtest -v -F c -f "st_db.backup"
stormtest
```

You may be prompted for a password. Enter “stormtest”.

This will create a file called st_db.backup, which is a backup of your database.

2.6.1.1.2 Backup the file repository

To backup the file repository, in the same command window execute:

```
svnadmin dump D:\STDatabase\svn_repository\stormtest > st_repos.dmp
svnadmin dump D:\STDatabase\svn_repository\stormtestsystem > st_system.dmp
```

Note that this command assumes that the repository is located in the default location. If it is located elsewhere, you will have to adjust the path accordingly. Also, for a large repository, this operation will take some time.

2.6.1.1.3 Restoring

If you wish to restore the database and repository at a later date, run the following commands. **DO NOT** run the first command unless you have a backup as it will remove all data from your database.

```
psql -d stormtest -U stormtest -c "DROP SCHEMA stormtest_facility CASCADE;"
```

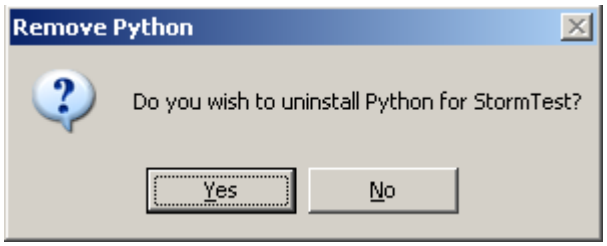
```
pg_restore -i -h localhost -p 5432 -U stormtest -d stormtest -v
"st_db.backup"

svnadmin load D:\STDatabase\svn_repository\stormtest < st_repos.dmp
svnadmin load D:\STDatabase\svn_repository\stormtestsystem < st_system.dmp
```

2.6.1.2 Install the 3rd Party Software

Carry out this step on all servers, whether they are a config server or not. Before installing the 3rd party installer you **MUST** uninstall the server software. If you do not, the upgrade will fail.

1. Download the StormTest 3rd Party Installer from the StormTest engage website and copy it to the server PC.
2. Exit from all StormTest related applications – e.g. the Server Monitor
3. Go to Start→All Programs→StormTest Server→Uninstall StormTest Server. If prompted, choose **NO** to leave python for StormTest installed.



4. Run the StormTest 3rd party installer.

2.6.1.3 Upgrading the StormTest config server

1. Download the StormTest Server installer from the StormTest engage website and copy it to the server PC.
2. Run the StormTest Server installer.
3. When the installation wizard asks for the **Setup Type**, choose **Complete**.
4. All other entries in the wizard should be pre-filled and can be left unchanged.
5. Reboot the server

2.6.1.4 Upgrading a StormTest server

1. Download the StormTest Server installer from the StormTest engage website and copy it to the server PC.
2. Run the StormTest Server installer.
3. When the installation wizard asks for the **Setup Type**, choose **Typical**.
4. All other entries in the wizard should be pre-filled and can be left unchanged.
5. Reboot the server

2.6.2 New Installation

The first thing to be done when setting up a StormTest facility is to choose which PC will be the configuration server. The chosen PC will be a critical component in the facility so it should be a PC with redundant power supplies and RAID mirroring to enable hot swapping of failed power supplies and disks.

Any StormTest server PC can be chosen as the configuration server. Note that if another PC is chosen (i.e. one that is not in a StormTest rack), then the **StormTest Database** will have to be installed first. If a StormTest server PC is being used, this step can be skipped.

2.6.2.1 Installing StormTest Database

1. Run the StormTest Database installer
2. The wizard will prompt you for a location to store the data files. This location should be on a disk with plenty of space and should be backed up on a regular basis.

Figure 1 : Database Installer data storage location

2.6.2.2 Installing on a StormTest server/config server

Follow these steps if you are installing on a machine that will be both a StormTest server and a StormTest config server or just a StormTest server.

First, run the StormTest 3rd party installer to completion. This installer **MUST** be run before the server installer is run.

Then run the StormTest server installer, for example StormTestServerInstaller-3.2.0.exe

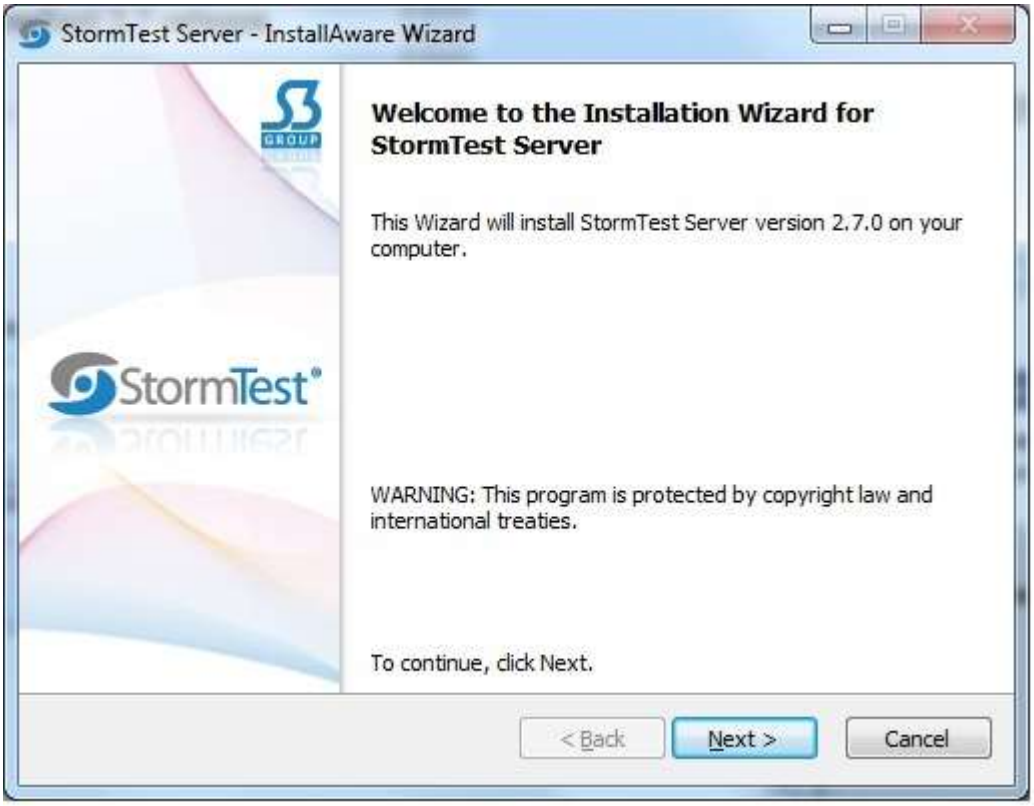


Figure 2 : Server Installer Server Welcome Screen

Press *Next* to advance through the wizard screens.

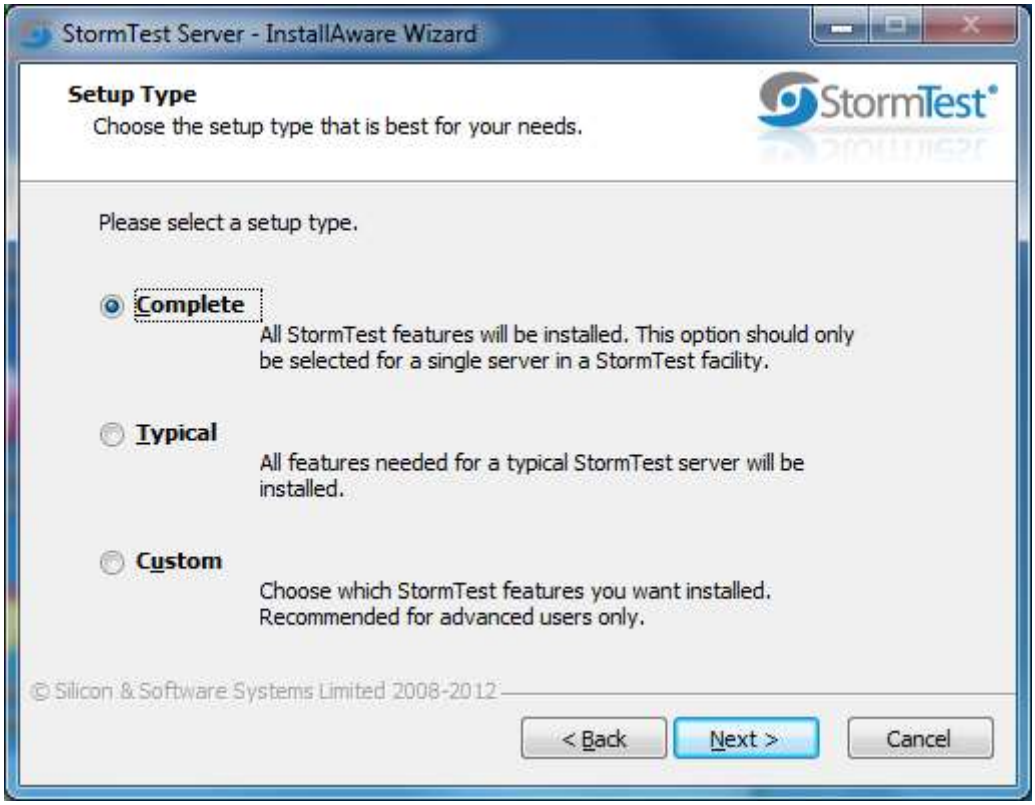


Figure 3 : Setup Type Screen

Choose the **Complete** option on the **Setup Type** screen.

If you are installing this on a PC that will be both a StormTest configuration server and a StormTest server, ensure that you choose the **Complete** installation option.

If you are installing on a PC that will just be a StormTest server, choose the **Typical** installation.

Navigate through the screens to select the destination and the program folders.

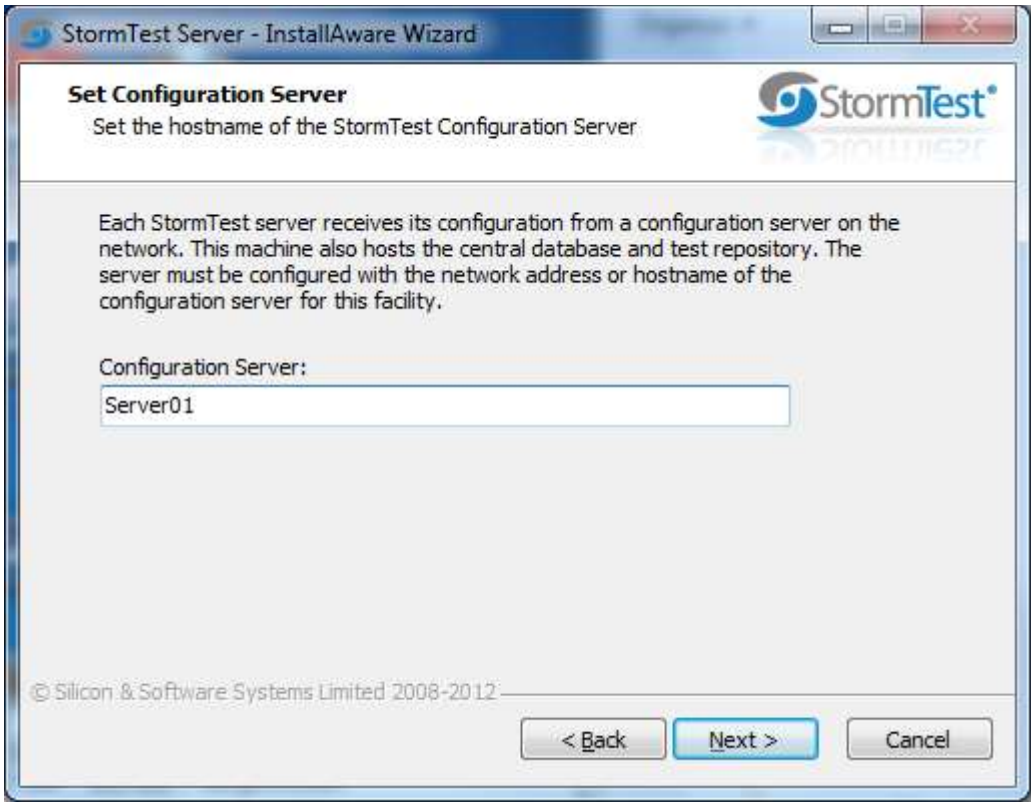


Figure 4 : Set Configuration Server Screen

When you reach the screen in Figure 4 you will need to supply the hostname or IP address of the Configuration Server. If this is the **Complete** install option, it will be the hostname or IP address of the current machine.

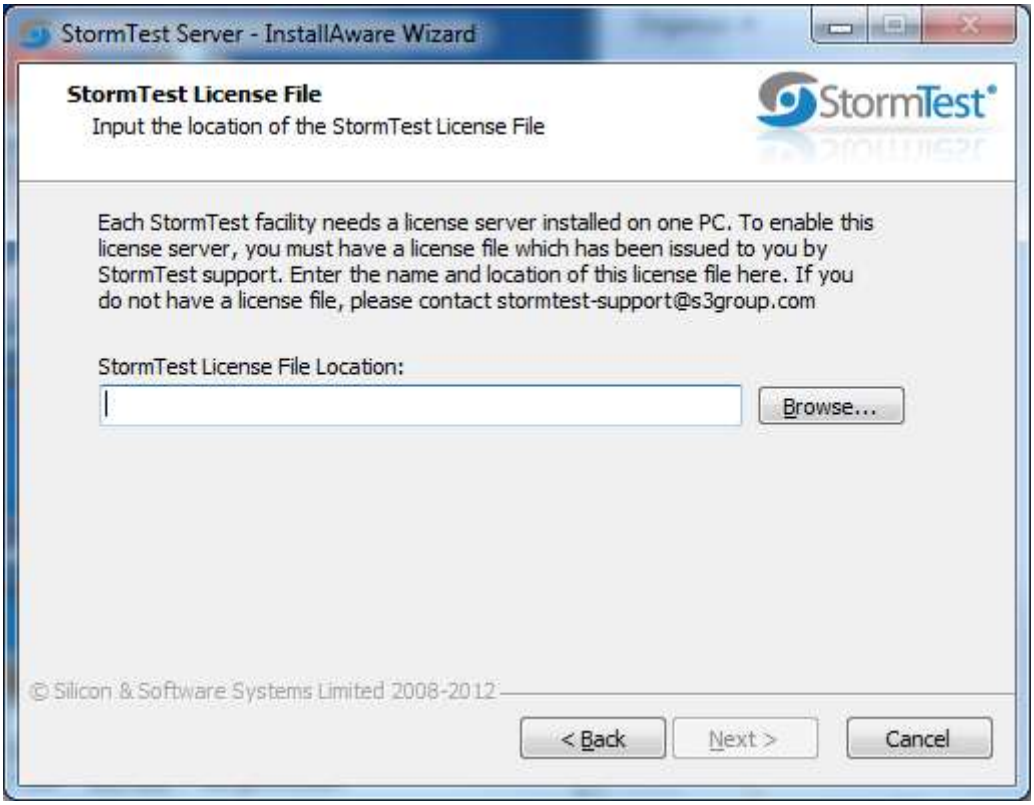


Figure 5 : Select StormTest license file

The screen shown in Figure 5 is only displayed for the **Complete** installation (i.e. the Configuration Server installation). Only the configuration server needs the license file information, as the rack servers will get their licensing information from the configuration server. You will need to browse to the location of the license file supplied by S3 Group. This file contains the licenses for all the servers in the facility and also the floating client licenses.

Click *Next* and navigate to the screen shown in Figure 6

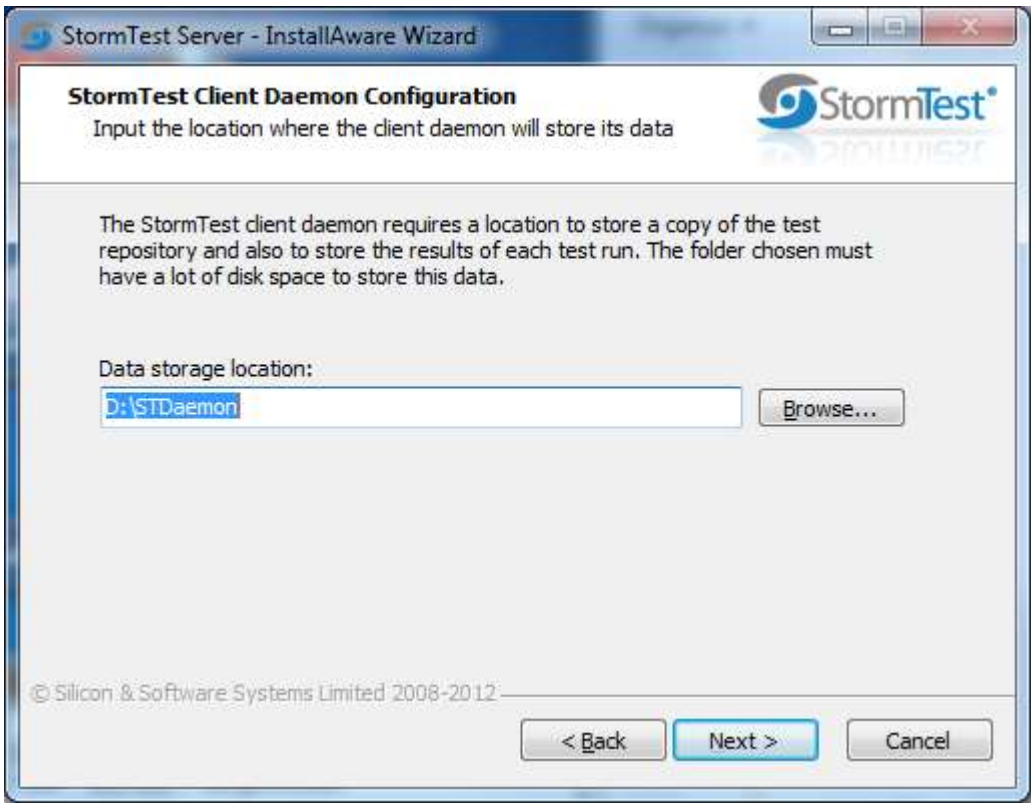


Figure 6 : Client Daemon Configuration Screen

This specifies the directory used to store both the log files generated by test runs and a copy of the test repository. This directory should have a large amount of free disk space. If there is less than 10GB free on the selected disk, then the installer will display a warning. On StormTest server PCs, the D:\ partition generally has a large amount of disk space, so a directory on this drive should be selected. If in doubt, use the default option.

Once you have done this, click *Next* to install.

This will install and start the following services:

- Configuration service (only for **Complete** install)
- License service (only for **Complete** install)
- Scheduler service (only for **Complete** install)
- Email Notifier service (only for **Complete** install)
- Client Daemon service
- License Client service
- License Status service
- Watchdog service
- StormTest Server host service

In addition, the following items will be installed:

- PHP enabled web server (only for **Complete** install)
- Python

- StormTest administration console web application (only for **Complete** install)
- StormTest Test Manager web app – also known as the Developer Suite web app (only for **Complete** install)

You may be asked to reboot your PC at the end of the installation process. If you are, then please do so. After rebooting if you go to *Start->All Programs->StormTest Server,* you will see the following menu after the **Complete** installation. The *Licence Server Manager* option and the *Reread the StormTest license file* option will not be present after a **Typical** installation

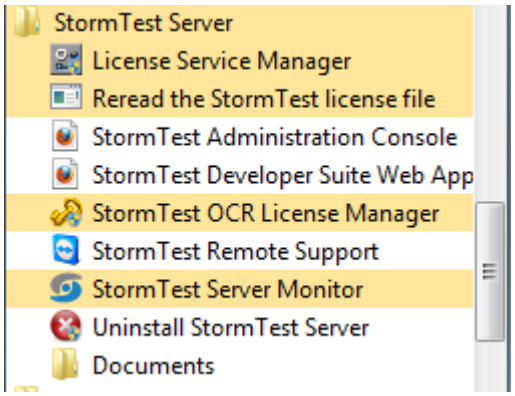


Figure 7 : StormTest server program folder

If you wish to use the StormTest email notification feature, follow the steps in section 2.6.3.5.

2.6.2.3 Installing a standalone config server

If you wish to have a standalone config server, then follow these steps. Note that you must have the StormTest Database installed prior to running the StormTest server installer.

You must also run the StormTest 3rd party installer before using the server installer.

Run the StormTest server installer, for example StormTestServerInstaller-3.2.0.exe

On the **Setup Type** screen, choose the **Custom** option.

Select the following components for install:

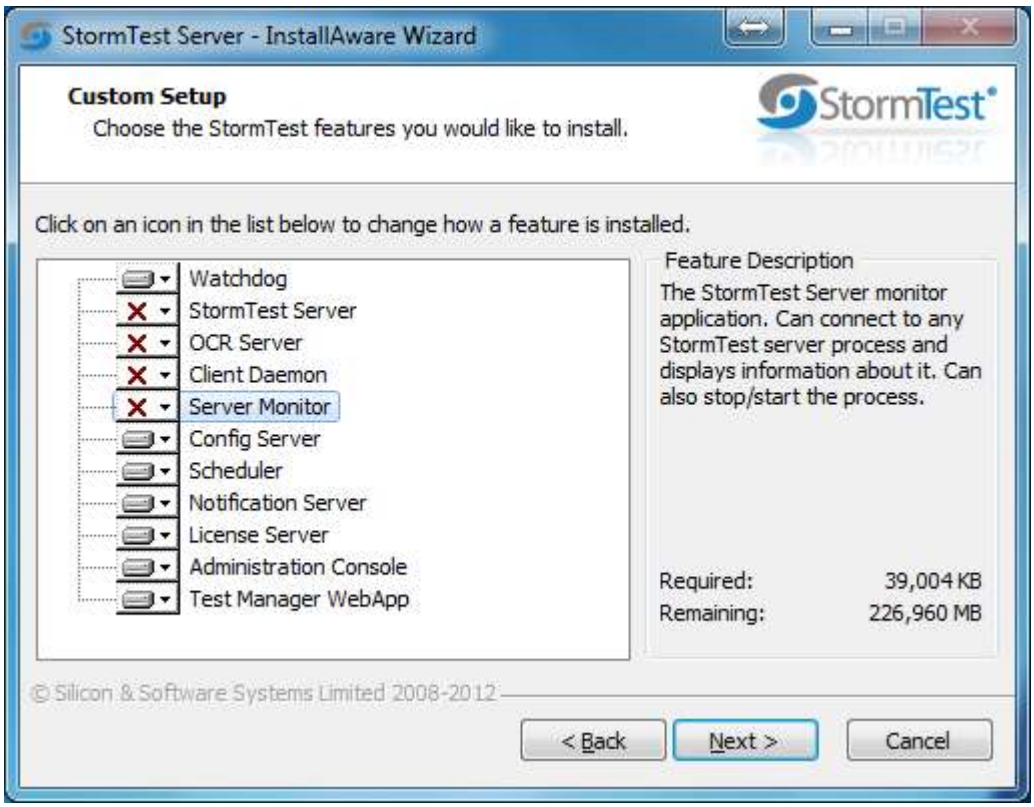


Figure 8 : Custom setup screen

You can optionally choose the Server Monitor component also.

Then proceed with the install as documented in the previous section.

2.6.3 Configure the Facility

At this point, all the software components are installed on all the servers and there is a single configuration server in the facility. However, before any of the servers can run, the facility must be configured in the database and each server must be added to the database.

2.6.3.1 Creating the Facility

The administration console is a web application that allows a user to configure the facility and the servers and devices under test (DUTs) in the facility.

Open the administration console by opening a web browser (Internet Explorer 7 or greater is required) and going to http://localhost/stormadmin/ on the configuration server. The administration console can also be viewed from any network connected PC by replacing the '*localhost*' in the URL with the IP address or hostname of the configuration server.

This will show you a welcome screen such as the one shown below:

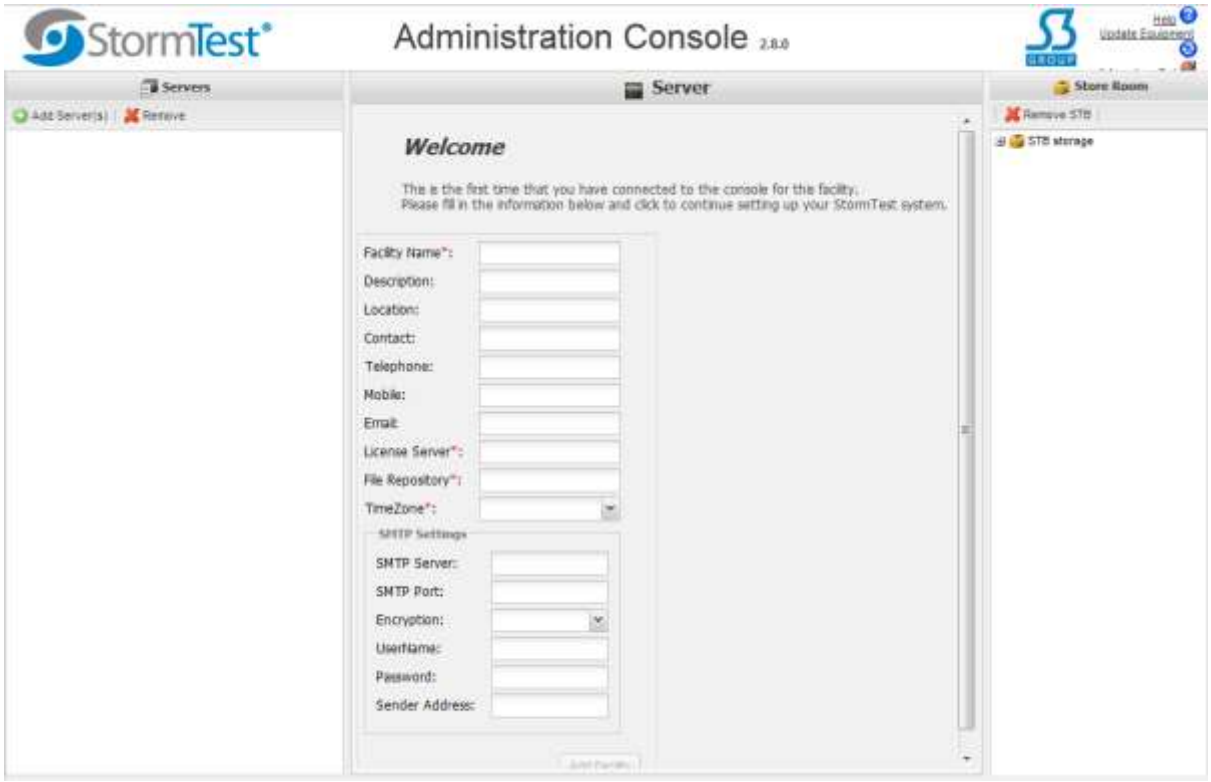


Figure 9 : Admin console welcome screen

Enter the facility information on this screen.

For the license server, enter the hostname of the Configuration server.

For the file repository, enter `hostname/stormtest` where *hostname* is replaced with the actual hostname of the configuration server.

If you wish to use the email notification facility of StormTest (which allows StormTest to send emails when test schedules are complete), then enter the details for your corporate SMTP server.

Click “OK” and the facility will be created in the database.

2.6.3.2 Create User Account

Now, you must create a user account and logon to the administration console.

Click on the *New User* tab and enter a username and other details. Please make your username the same as the username you ordinarily use to logon to windows.

Figure 10 : Create user account

2.6.3.3 Add Servers to the Facility

Now you must add all the servers in the facility to the database by using the administration console. Click on the *Add Server* link on the left of the administration console page. This will pop up the dialog box shown in Figure 11.

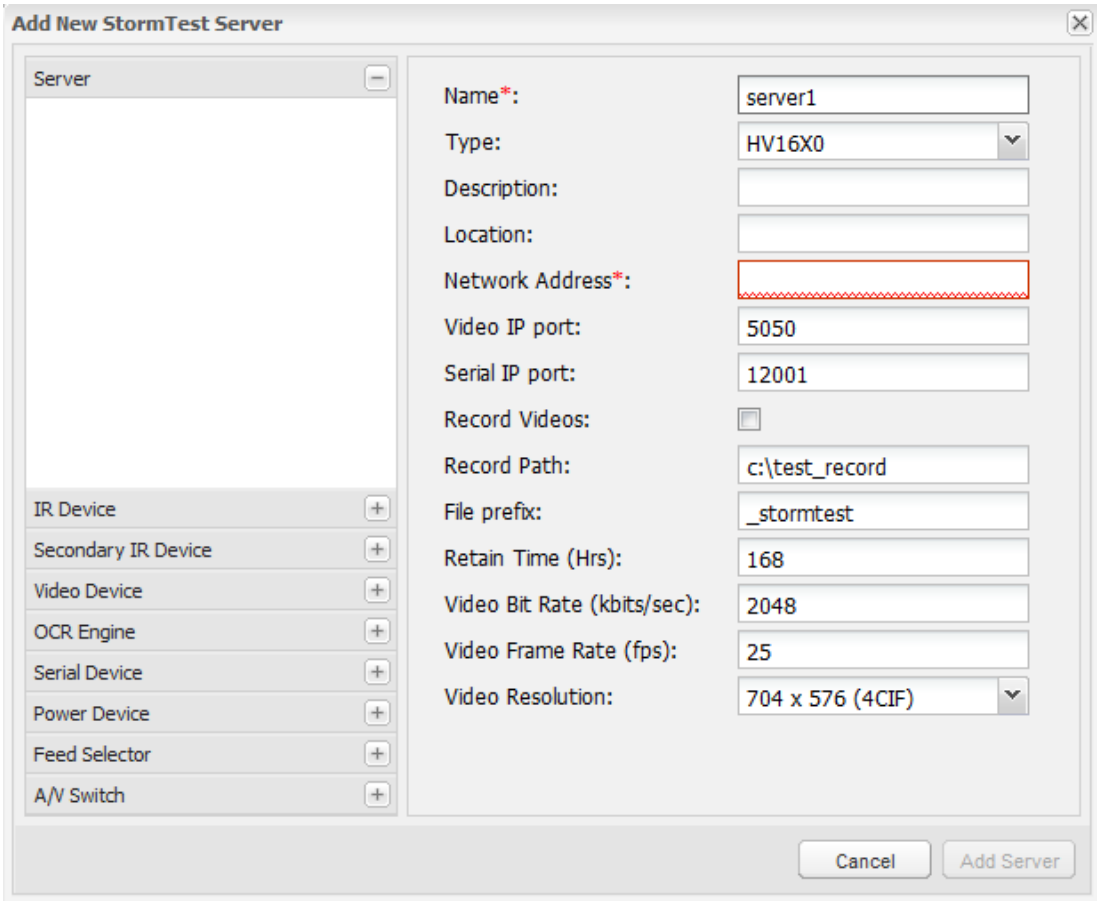


Figure 11 : Add new server dialog box

In the *Type* field, select the appropriate server type. This will pre-fill most of the fields for you with the default device types and the default IP addresses for the StormTest product you chose. If you are unsure which product type you have, please ask StormTest support. Now, give the server a name and also fill in the network address/hostname of the server. The other settings are optional and may be adjusted now or at a later time.

Note that if you enter an IP address in the *Network Address* field, then you **must** enter the hostname of the server in the *Name* field. If the hostname is in the *Network Address* field, then you can enter any text into the *Name* field.

Finally, click *Add Server.* Repeat this process for each server in the facility.

If you wish to re-configure a server after it has been created, just click on the *Configure* link.

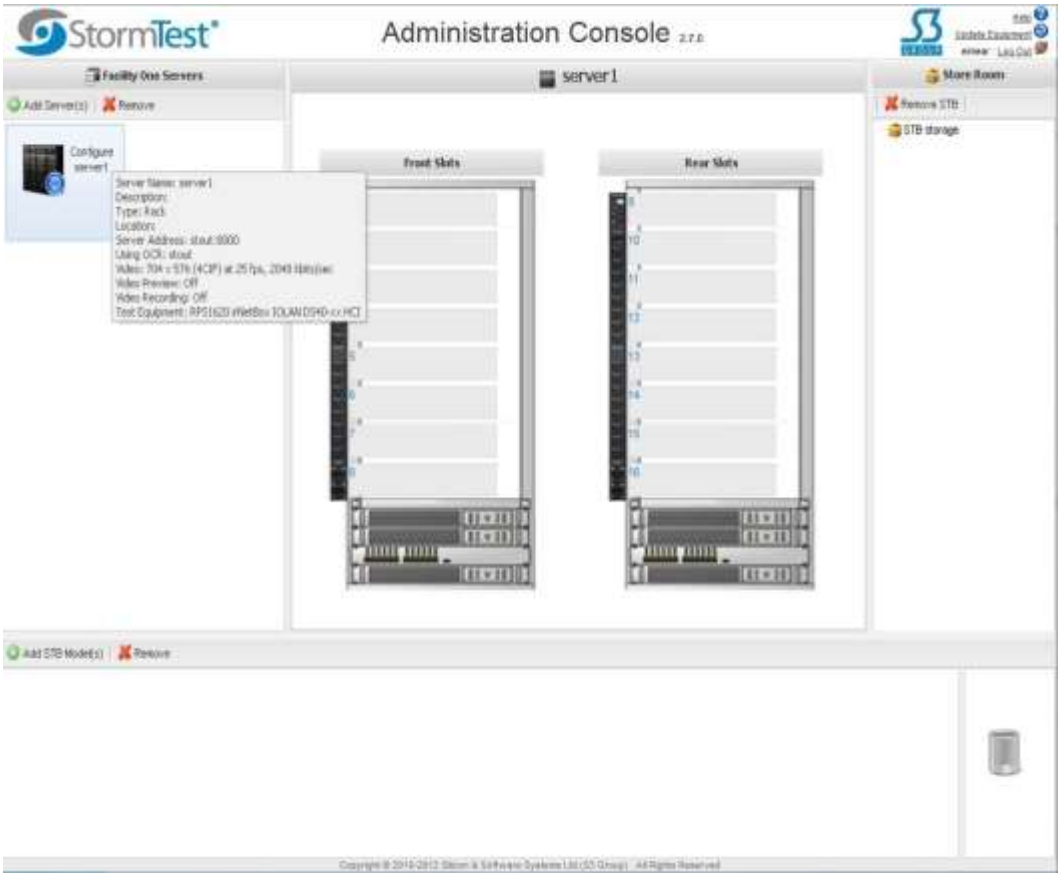


Figure 12 : New server created

2.6.3.4 Configure Device Types

The video, IR, serial and power switch devices in the rack can be configured with a device type and an IP address. This data will not need to change unless you are reconfiguring the IP addresses as described in **Error! Reference source not found.**.

If you need to change the network address of any of the devices, select the device type from the left hand side and enter the new IP address or hostname. The port number used by each device will be added automatically by the administration console.

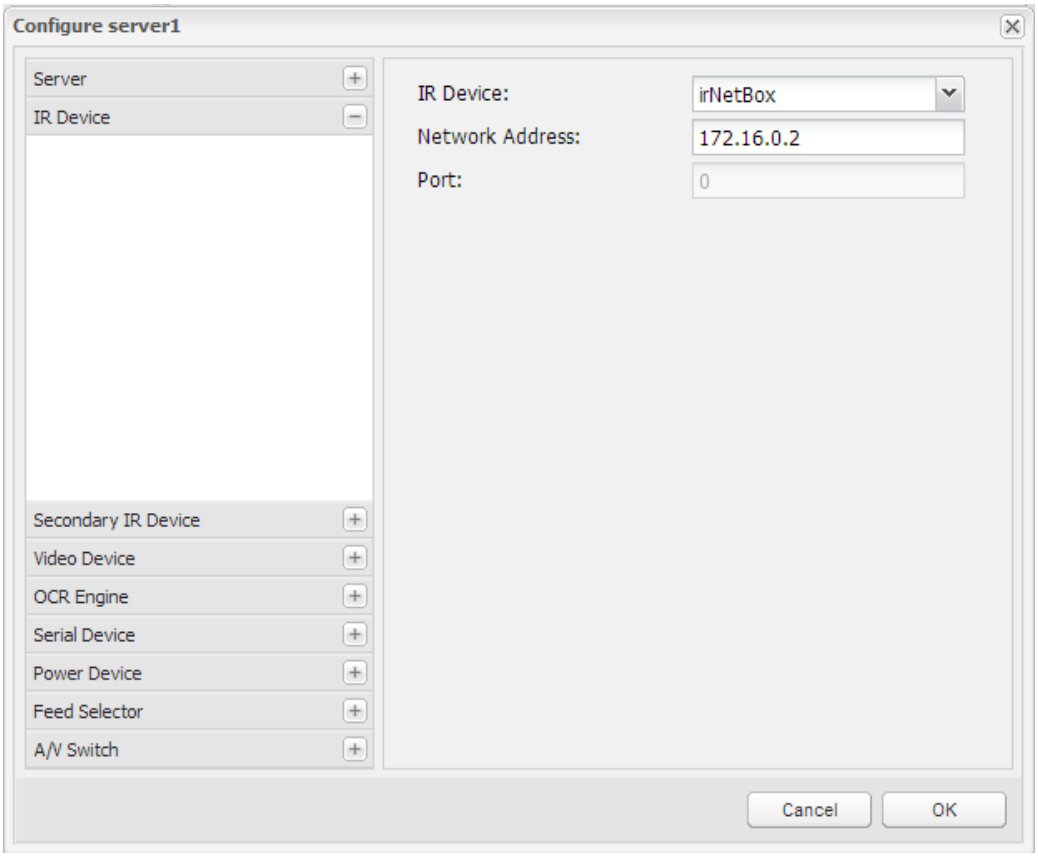


Figure 13 : StormTest Server Device Configuration

To do OCR analysis at least one OCR engine has to be installed and running. The StormTest OCR engine is installed along with the StormTest server software. The OCR engine is automatically started by the StormTest host service. However it will only execute, if it is properly licensed. The license is provided by a USB dongle.

In most cases, each StormTest server will come supplied with the OCR dongle. However, if a StormTest server does not have an OCR license, it can re-direct all OCR requests to the *OCR engine* running on another StormTest server by choosing a different server in the *OCR Engine* panel.

2.6.3.5 Configuring the StormTest Notification Service.

StormTest server now includes a feature to allow email to be generated after schedules are complete. Once the StormTest server software has been installed, this feature must be configured.

If you wish to use the new email notification service, you must add your SMTP server details to your facility. To do this, open the StormTest Administration Console (http://localhost/stormadmin on your config server) and click on the facility name.

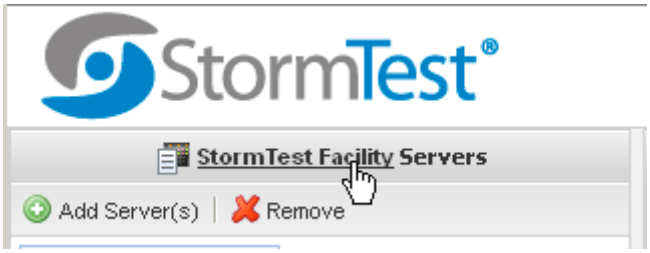


Figure 14 : Open Facility configuration

Add the name of your SMTP server, and its port number. The standard port number for unencrypted SMTP connections is **25**. For encrypted connections, it can vary – please contact your local IT support to obtain the correct information.

There is also a one off modification to the StormTest Email Notifier Service required after software installation. This is required to ensure it uses the correct date format for the region the server is located in. Go to *All Programs→Administrative Tools→Services*. Locate the StormTest Email Notifier Service. Double click on the service and choose the *Log On* tab.

Select *This account* and enter a local administrator account. We recommend using the StormTestUser account.

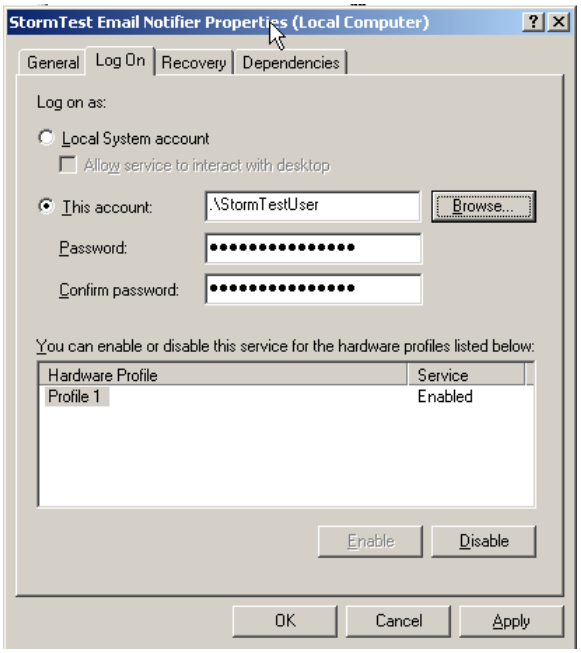


Figure 15 : Service configuration

Click *Ok* and then restart the service.

If this step is not carried out, the notification service will still work, but all times and dates will be in the default (US) format

2.6.3.6 HS64 Specific instructions

In addition to the standard components found in each StormTest server variant (HV01, HV04, HV16), the HS64 requires that the audio/video switches be configured in order for the HS64 sub-slots to work correctly.

To do this, open the server device configuration dialog and select the *A/V Switch* panel. Now select all 16 slots and click *OK*.

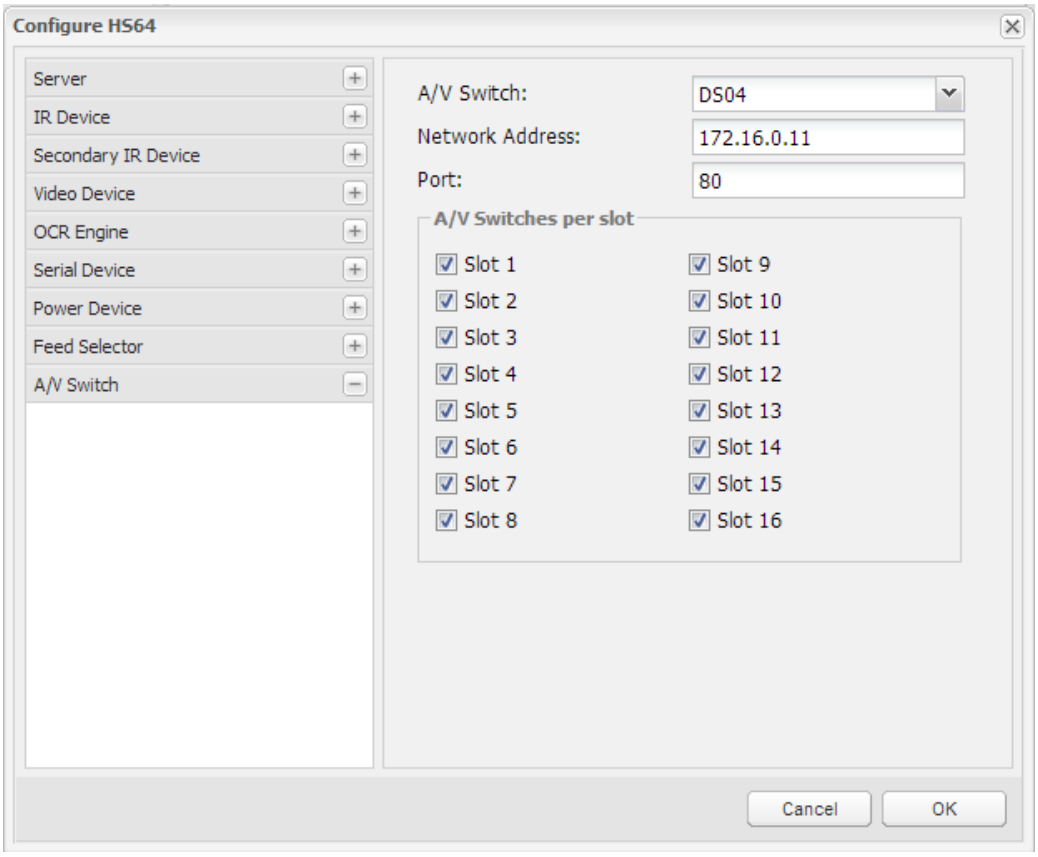


Figure 16 : StormTest HS64 Server Device Configuration

Note that you must select **all** the slots on this configuration screen.

2.6.3.7 Restart the server

Once a StormTest server has been configured in the administration console, the server should be restarted to ensure it picks up the new settings.

If the server has been reconfigured, it is enough to restart the StormTest server using the server monitor application.

However, if it is a newly configured server, then the server PC needs to be restarted before the StormTest server will start correctly.

2.6.3.8 Enable/Disable GPU Accelerated Video Compression

As of StormTest version 3.3, it is possible to switch on GPU accelerated video compression for HD StormTest systems.

To enable this feature, you need to add a new key to the Windows registry. The key needed is

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Silicon & Software Systems
Ltd\StormTest\Server\UseSoftwareEncoder
```

An easier way to configure this setting is to copy the below text into a file with the .reg extension and then execute that file.

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Silicon & Software Systems
Ltd\StormTest\Server]
"UseSoftwareEncoder"=dword:00000001
```

Once you've set the registry value, a restart of the StormTest Host Service is required. This can be done from the command line:

```
net stop "StormTest Host Service"

net start "StormTest Host Service"
```

Disabling the GPU accelerated video compression feature is a case of changing the above setting to 0 and then restarting the StormTest Host Service.

2.6.4 Adding DUTs to the facility

Once the facility and the servers have been configured, it's time to add all the DUTs to the facility. This is a multi-step process that involves

1. Training the IR
2. Creating the remote control skin
3. Defining the DUT model
4. Creating a DUT instance

2.6.4.1 Training the IR

To train the IR you will require the USB RedRat3 device that was supplied with your StormTest system. You will also need to download and install the StormTest Admin Tools from the engage website. The Admin Tools can be installed on any PC – it does not need to be installed on a StormTest server.

Figure 17 : RedRat3 device for training remote controls

Installing the admin tools will also install the RedRat3 driver. After the admin tools have been installed, connect the RedRat3 device to your PC. The Windows 'New Hardware' wizard will be display.

Choose "No, not this time" on the first screen and "Install the software automatically" on the second screen.

Once this is completed, you can start up the admin tools. If your operating system is Windows 7, then you will need to start the admin tools as an administrator initially (right-click on it and select "run as an administrator"). On subsequent runs, it can be run as a normal user.

Choose the IR Trainer applet and then the IR Databases button. At this point you will see a screen such as this:

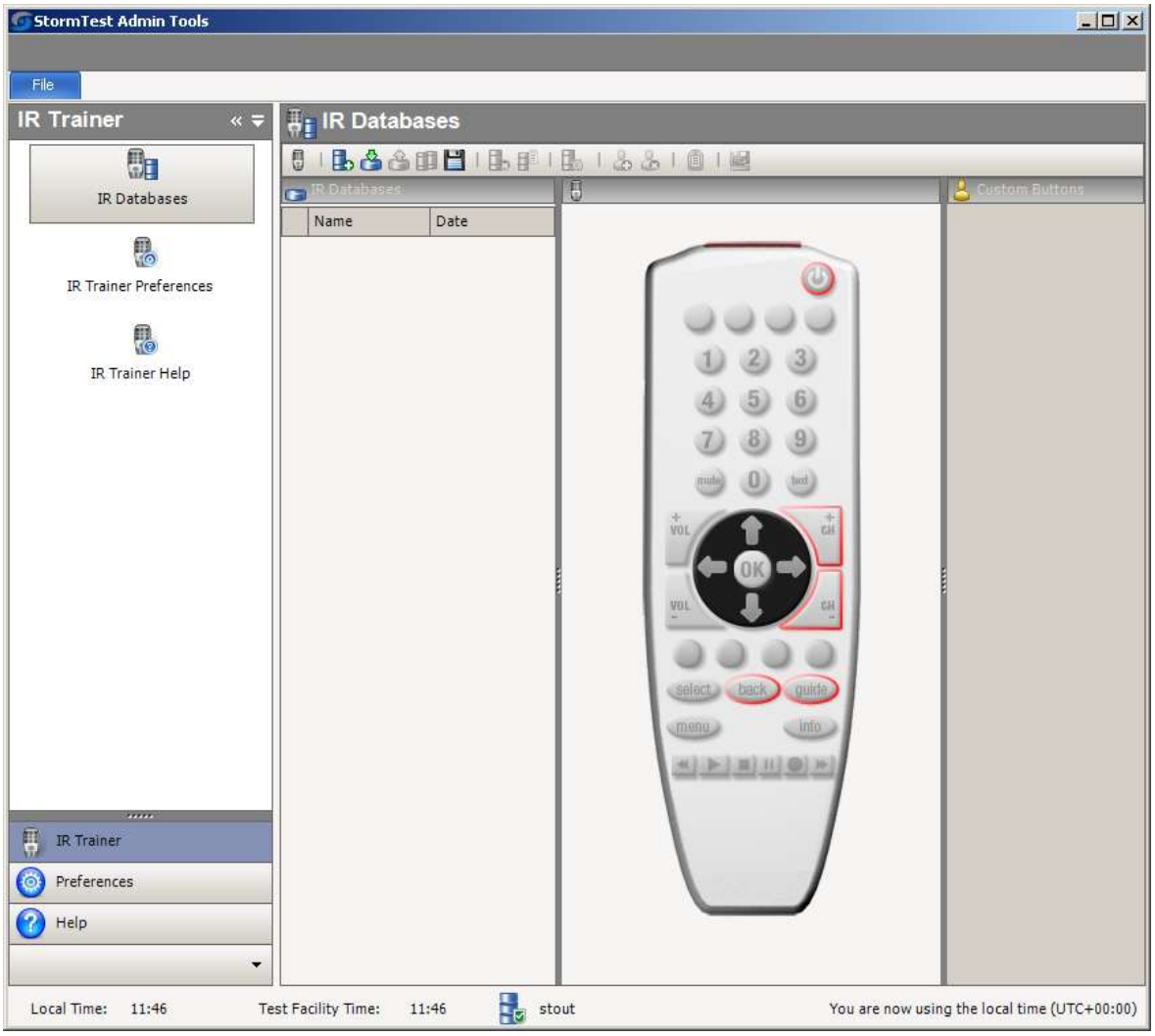


Figure 18 : Admin tools IR trainer

There are no remotes trained in this database. To train a new remote, select . If you have an existing IR code text file, then you can import it with the button.

Give the new remote a name and a description:

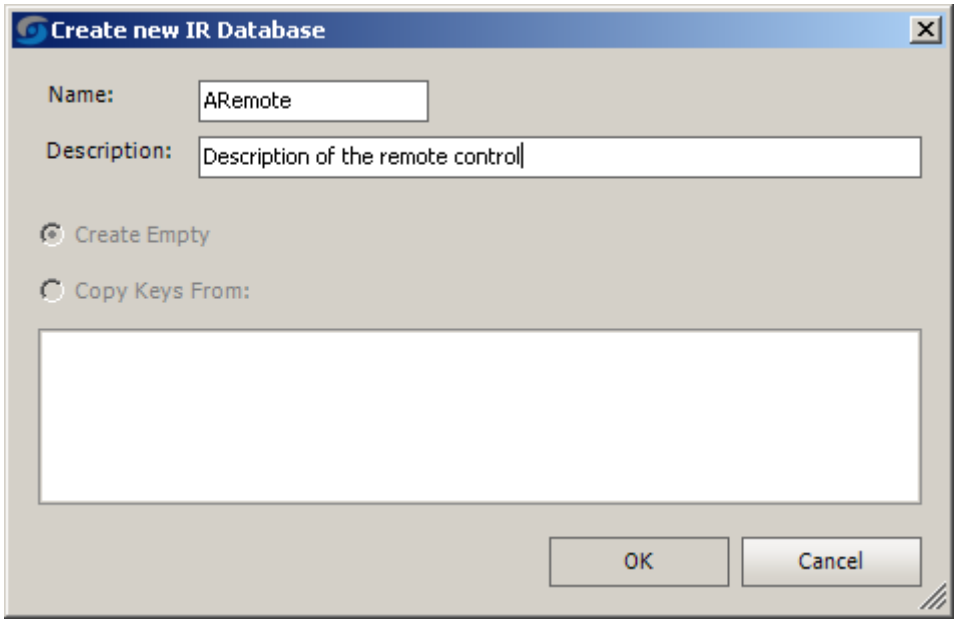


Figure 19 : Create new IR database

Now you can proceed to train the buttons on the remote control. The skin displayed is a generic one, so if there are buttons on your remote that don't exist on the generic skin, you can add them using the icon  .

The first time you try to train a button, you will be shown this dialog:

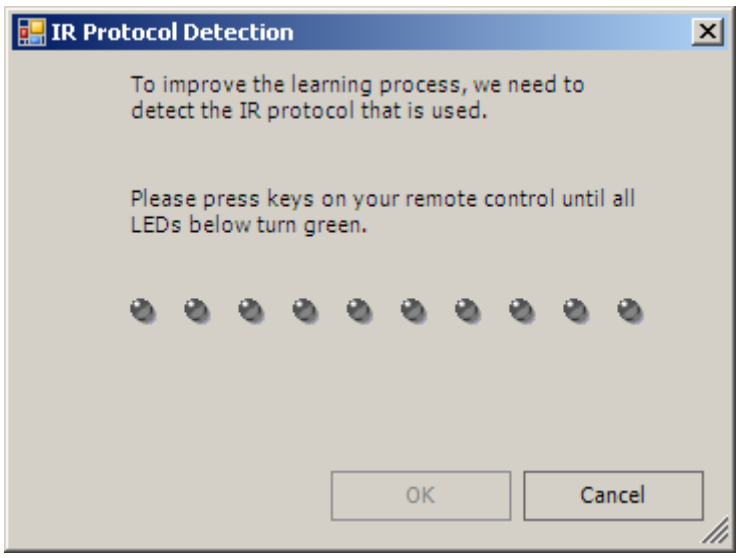


Figure 20 : IR protocol detection

Follow the instructions in the dialog and the IR trainer will attempt to detect the IR protocol used by your remote.

To train each button, click on it and then press the physical remote control button twice while pointing the remote at the RedRat3 device. Once you see two green ticks, the button has been trained.

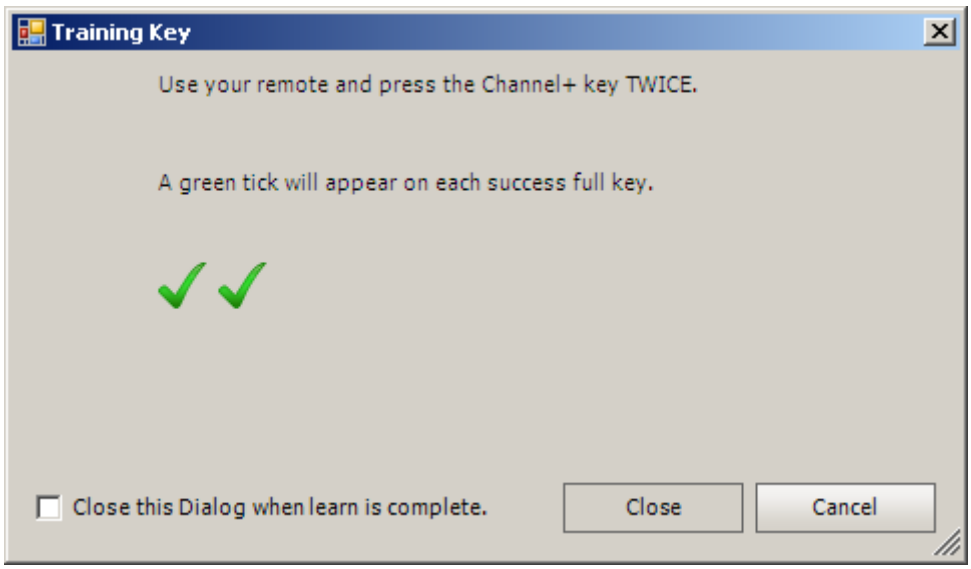


Figure 21 : Button successfully trained

To test that the training of a button succeeded, simply click on the button on the skin and the IR will be transmitted by the RedRat3. To retrain a button, shift+click on it.

For more details on the admin tools application, see the **Error! Reference source not found.**.

2.6.4.2 Creating the Remote Control Skin

Creation of the remote control skin is done in the admin tools application. Once the IR buttons have been trained, the skin designer can be opened by clicking on the  button.

The skin designer allows you to upload an image of the remote control and then define where the buttons are on that image. Then each button can be linked to a previously trained IR button.

To upload a skin, choose the “Select Skin” button and select an image. The designer can then automatically generate the ‘modified skins’ – ie the skins in the various states; pressed, disabled, highlighted.

The auto-generated modified skins can be replaced with user defined versions by selecting the respective skin and clicking on the “Select Skin” button.

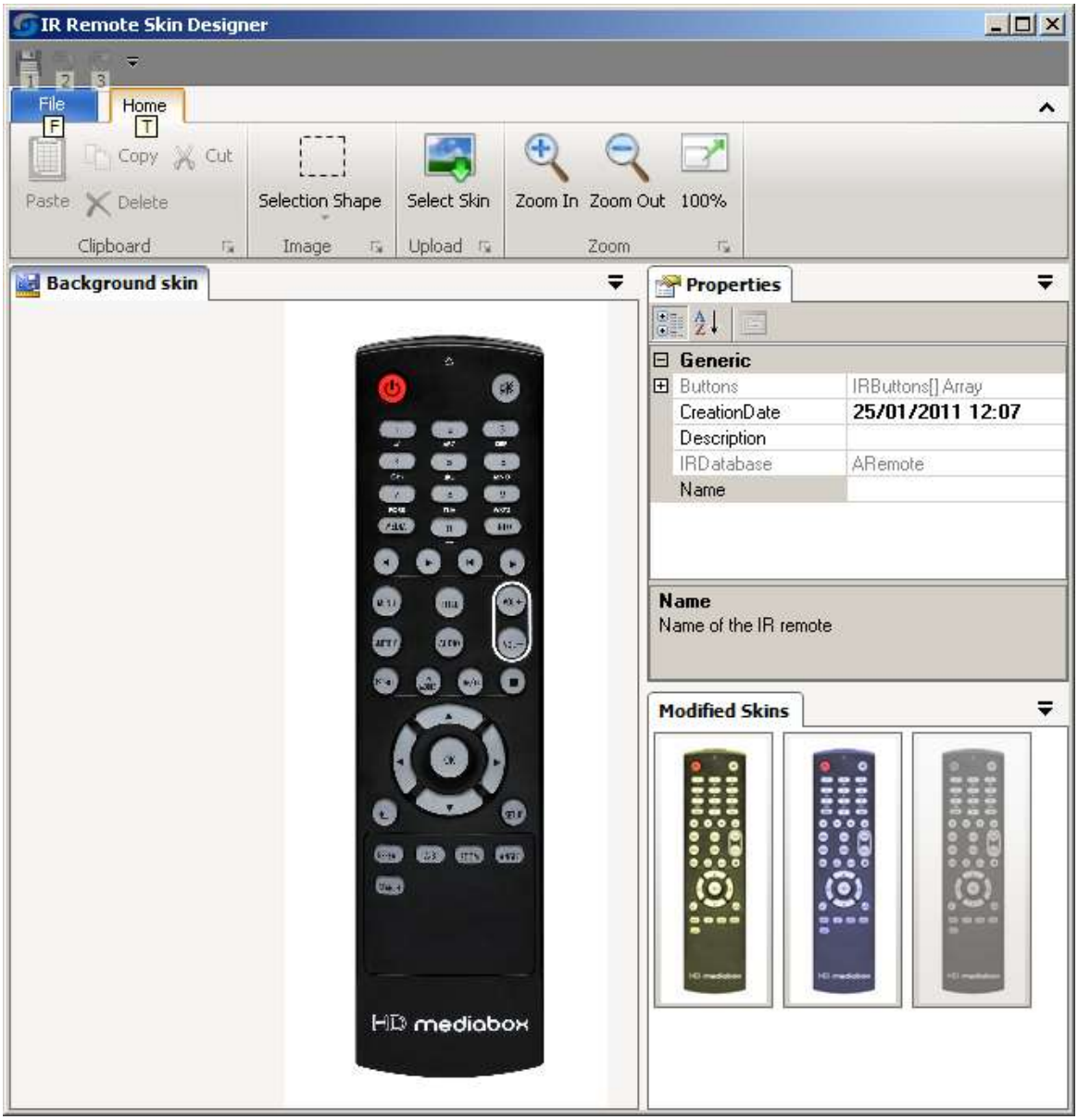


Figure 22 : Skin designer

Buttons can now be defined by dragging a selection shape over each button. Each selection has a property sheet and in this property sheet you can assign an IR button to that selection.

Once you have selected all the buttons, close the skin designer and you will be prompted to save the skin.

For more information on the skin designer, please see the **Error! Reference source not found.**.

2.6.4.3 Defining the DUT model

It is very important for the proper functioning of the StormTest system that the DUT that resides in each slot of each server is recorded in the database.

For this to happen, you must first create a device **model** type. Exactly what a model is will depend on each installation, but it can be thought of as a collection of DUTs that share some common parameters.

The most important of these shared parameters is that all devices of the same **model** share the same IR database.

However, it's quite possible to have more than one model type that share the same IR database, but which differ in the manufacturer type. For example model A and model B DUTs may both use IR database X, however if they are made by different manufacturers, then they could be considered to be different models.

In the end, the decision on what constitutes a model is a decision that must be made by the end-user of StormTest.

The interface that allows users to enter this DUT model information is the **StormTest Administration Console**.

To create a new model type, click on *Add DUT Model(s)* at the bottom of the StormTest administration console.

Then enter the parameters for the model.

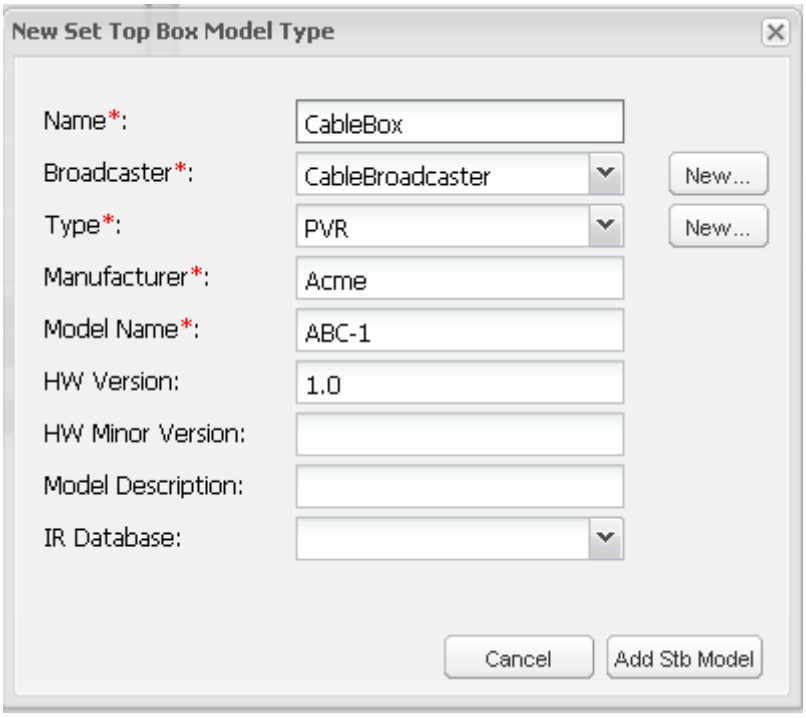


Figure 23 : Create device model type

New broadcasters and box types can be added by clicking on the *New …* buttons.

Clicking on the *IR Database* drop-down list will allow you to select any of your previously trained remote controls.

Once a device type is created, it will be listed at the bottom of the administration console.

2.6.4.4 Creating a DUT instance

To create an instance of a device, you must drag the model type from the bottom of the administration console to the slot that the actual physical box is in.

First, select the StormTest rack that the device instance will be put into. Then drag the icon representing the model of the box into the slot that the instance will be in. When you see a green tick, you can release the mouse button. At this point, the admin console will prompt you for the instance parameters.

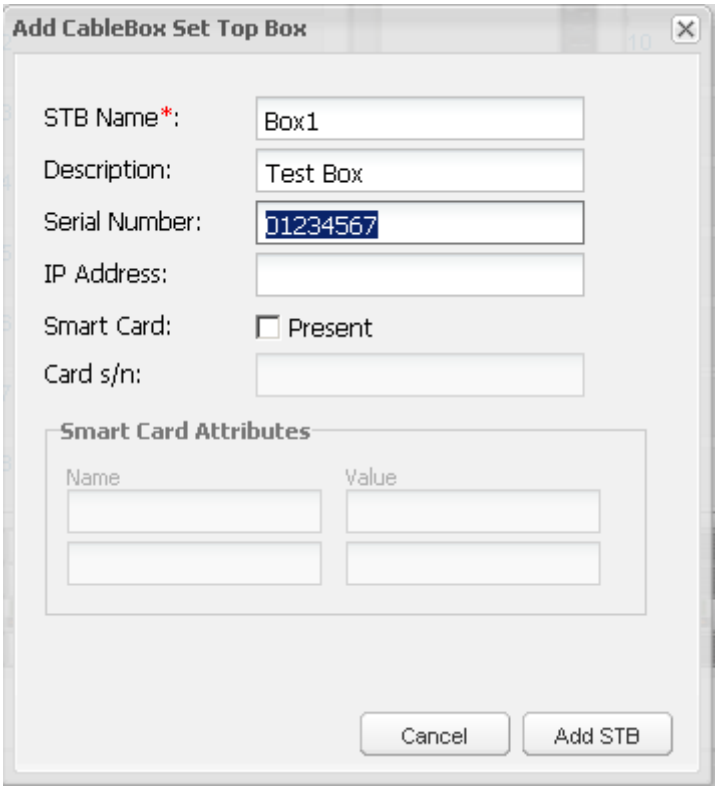


Figure 24 : Create device instance

You need to give each device instance a unique name, which should match any name that you already use to identify a device (e.g. label on the front of the device). This will make it much easier to administer the rack as a user that moves the box from one slot to another, can simply drag the corresponding name on the admin console screen from one slot to another, thereby easily updating the StormTest database with the new location.

Once the instance is created, it will show up in the pictorial representation of the rack.

The device instance can then have its parameters re-configured by clicking on the *Configure* link next to it in the rack.

2.6.4.5 Removing a DUT Instance from a Slot

To remove an instance from a slot (for instance, if a device is being put into storage), then simply drag the instance from the slot in the rack on the admin console into the *Store Room*, along the right hand side of the admin console.

Figure 25 : StormTest facility store room

The device instance can then be dragged back into a slot in a server at some point in the future.

2.6.4.6 Deleting a DUT Instance or Model Type

To delete a device instance completely, you must drag it from the *Store Room* into the *Trash* can in the bottom right hand corner of the admin console.

Figure 26 : Deleting a device instance

This will remove the device instance from the StormTest database.

Similarly a device model type can be deleted by dragging it to the trash can. If this is done, all instances of that model type will also be deleted.

2.7 Switching a server to a new facility

Each StormTest server is shipped with StormTest pre-installed and pre-configured to be a standalone StormTest facility.

If however, you already have StormTest racks, then you will want to move this new rack into your facility. This can be achieved by following the steps below:

2.7.1 Update existing facility to support the new server

1. Open the Admin Console for your facility and add the new server to your facility.
2. Send a request to stormtest-support@s3group.com for a new license file that incorporates the server/client licenses from the new rack
3. Copy the new license file to the `C:\Program Files\StormTest Server\LicenseServer` directory on the config server
4. Run "Start->All Programs->StormTest Server->Reread the StormTest license file" on the config server

2.7.2 Change the new server to point to your config server

1. Open the "Add or Remove Programs" applet in the control panel on the new StormTest server.
2. Locate *StormTest Server* and click **Change**.
3. In the wizard, select "Modify Available Options" and click next
4. You will now see the component selection screen. Deselect the following components:
    a. Config Server
    b. Scheduler
    c. License Server
    d. Administration Console
    e. Test Manager WebApp
5. Click Next and enter the hostname of the config server for your facility.
6. Click next on the remaining screens, accepting the defaults. Note the location of the client daemon logs.
7. Once the installation is complete, remove the **WC** directory from the client daemon logs directory (it will be recreated with the tests from the new config server)
8. Finally, reboot the StormTest server PC.

If it becomes necessary to move a StormTest server from one facility to another, this can be achieved by following the same steps.

2.8 Repairing an installation

If files belonging to the StormTest installation are accidentally deleted or corrupted, the installation can be fixed by using the 'repair' option of the installer.

To access this, open the "Add or Remove Programs" applet in the control panel. Locate the StormTest Server in the list and click on "Change".

Then select "Repair Application" and the install wizard will re-install any missing files.

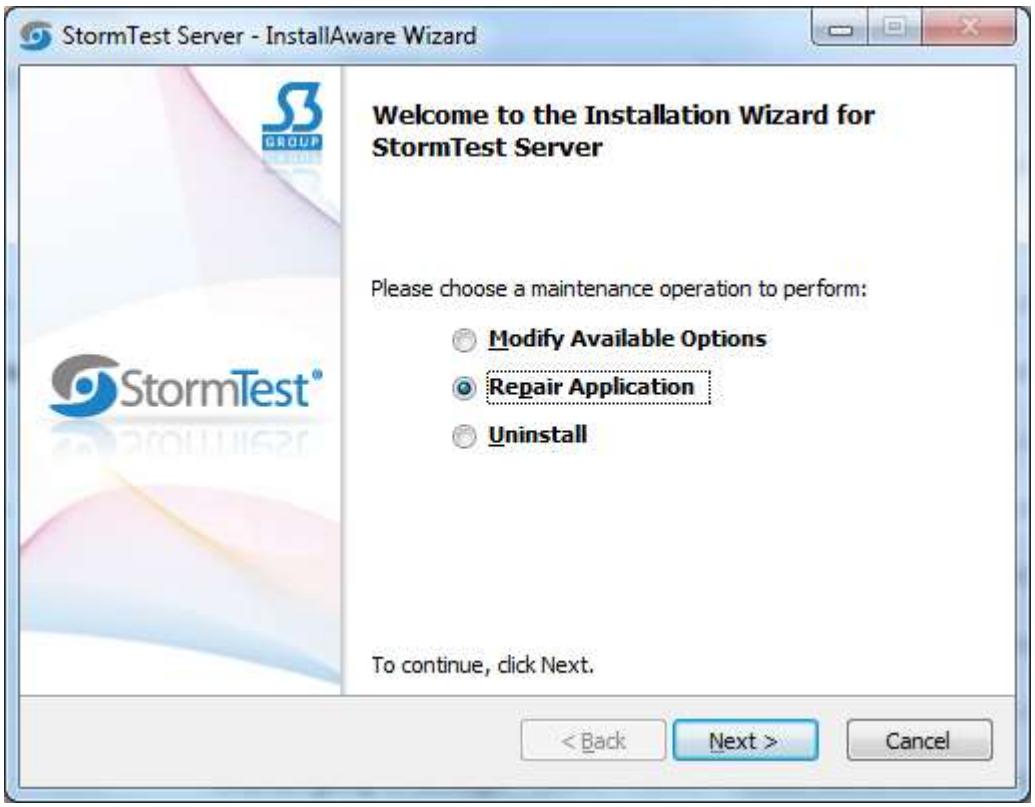


Figure 27 : Repair installation

Note that this 'repair' functionality is available for all StormTest software installers.

3 Guide to Installed Tools

3.1 Client Daemon

A StormTest client daemon is installed on each StormTest server. The client daemon runs StormTest client test scripts on behalf of the StormTest scheduler.

If required, it is also possible to install the client daemon on a PC which is not a StormTest Server. In order to do this, you need to run the Server Installer, select *Custom* and choose the *Client Daemon* option. Then input the config server hostname when prompted. The client daemon will then register with this config server when it runs.

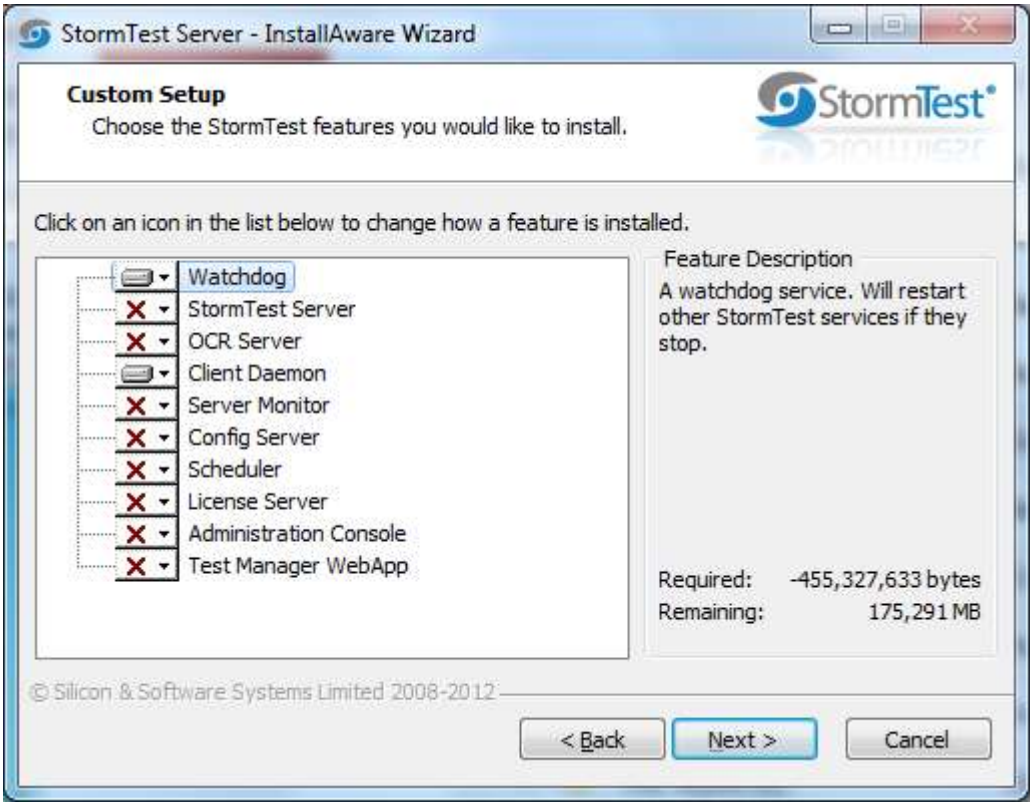


Figure 28 : Client Daemon only installation

Installing extra config servers allows a facility to balance the test load across more PCs, and is recommended if the scheduler is being used intensively to run tests (i.e. if all 16 slots in each server are running tests on a continuous basis).

3.1.1 Retrieving Test Run Log Files

All output from tests that are run by the client daemon are stored locally in the directory specified at installation (see Figure 6). To retrieve these files, a user can connect to the StormTest server with an FTP client and download the files. The FTP account to be used is **stormtest**. There is no password required.

When viewing test results with the StormTest Developer Suite, a link to this FTP location is provided to allow for easy viewing of the log files.

3.1.2 Storing Test Run Log Files on a Network Drive

It is possible to store the log files on a network drive by pointing the client daemon to a network mounted share during configuration.

As the daemon runs as a service under the local system account by default, it will not see any network shares. To see a network share, the service configuration must be modified to run as a local user. Please contact the support team to set this up.

CAUTION: it must be remembered that writing log files to a network share means that the performance of the disk writes will be greatly reduced compared to a real disk. This may have an adverse impact on the performance of your test scripts, especially if the scripts write a log of files, such as screen captures to disk. In addition, the behaviour of Developer suite when viewing the 'available space' on the Daemon information screen is undefined in this scenario.

3.1.3 Configuration

The default installation of the client daemon should not need any configuration. However, if you wish, you may adjust the following parameters:

- CPULimitPercentage (DWORD) – this is the CPU usage limit at which point the client daemon stops accepting new jobs. This is set to 80% by default and means that the client daemon won't attempt to run any more jobs, if it is already loaded to 80%.
- MinimumLogSpace (DWORD) – this is the amount of disk space that should be kept free in gigabytes. If the amount of disk space falls below this limit, then the client daemon will stop accepting jobs and will attempt to clean up some old log files to reduce the disk usage. The default value for this is 10GB
- TestLogFilesRetainHours (DWORD) – this is the number of hours that the client daemon will retain old log files from test runs in hours. It is set to 504 hours by default (21 days).
- MaxActiveScripts (DWORD) – this is the maximum number of scripts that the daemon will run at one time. Defaults to 16. You may wish to reduce this if you have a lower powered PC.

To modify any of these parameters, you must use the registry editor. Click "Start → Run…" and enter `regedit` then click "OK".

Now navigate to

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\StormTest Client Daemon
```

You can now change or create the keys listed above.

3.2 StormTest Server Monitor Application

The StormTest monitor application allows a user to monitor all the StormTest servers in a facility. It allows the user to view the status of each server and monitor the video output on each server slot. The monitor application is installed on each server, but any instance of it can monitor the status of any other server in the facility.

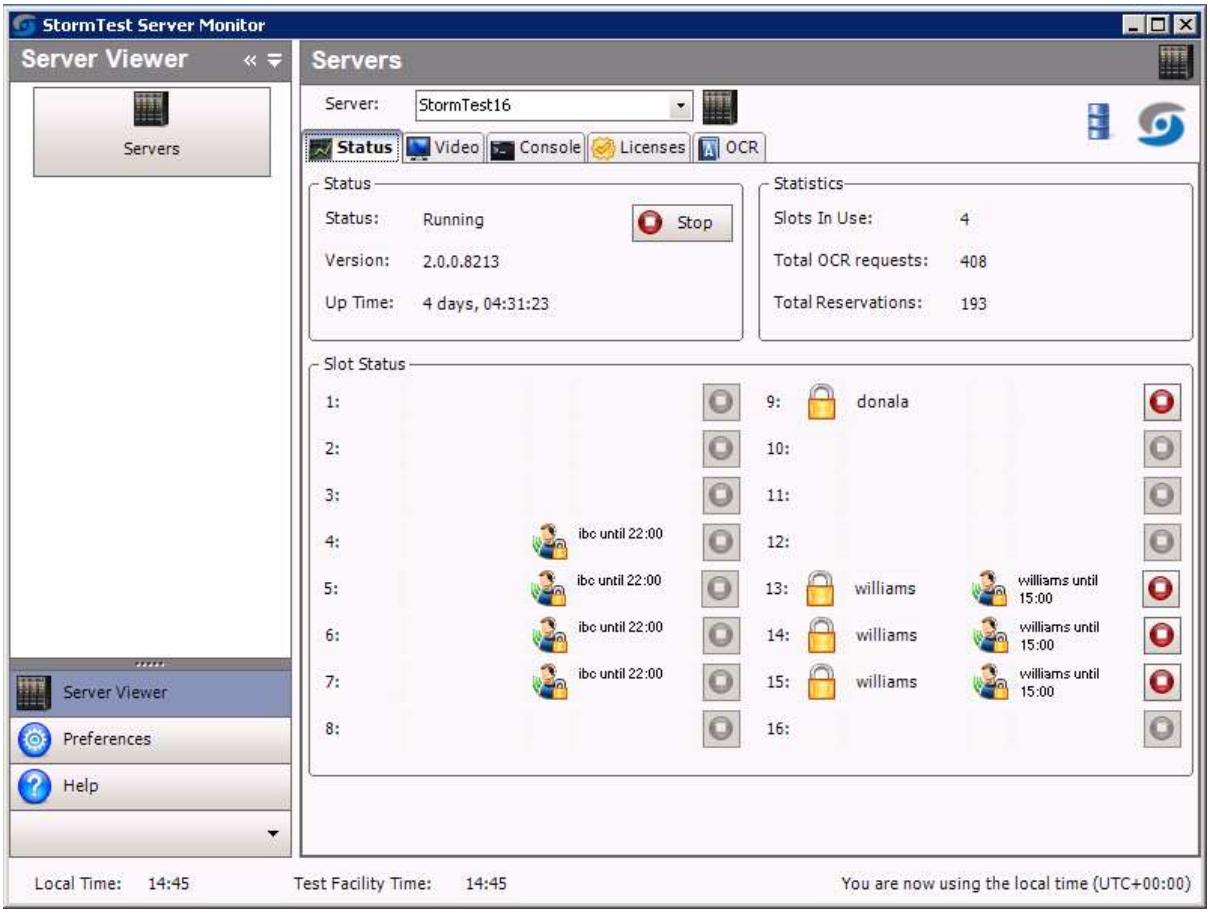


Figure 29 : Server viewer – status

The *Server Viewer* window enables the user to select a server and monitor its operation.

The status tab gives an overview of what is going on in the rack – the version of the server, its current status and up time, how many OCR requests have been carried out, and how many slot reservations have been made. It also shows which slots are currently in use.

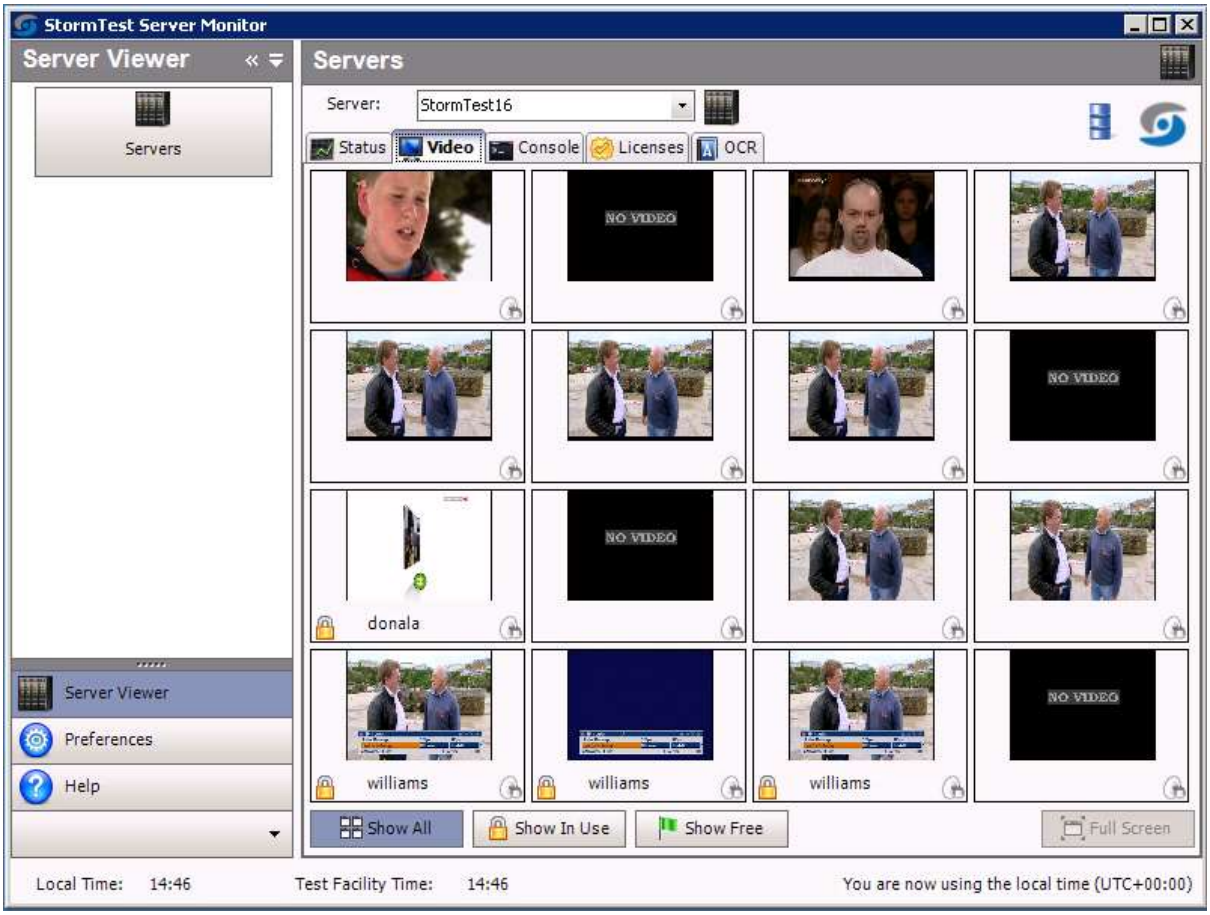


Figure 30 : Server viewer – video

The video tab displays video output for the DUTs in the rack. You can use option buttons *Show All, Show In Use* and *Show Free* to display whatever combination of outputs you would like to see. In order to hear audio, click on the speaker icon in the appropriate video window.

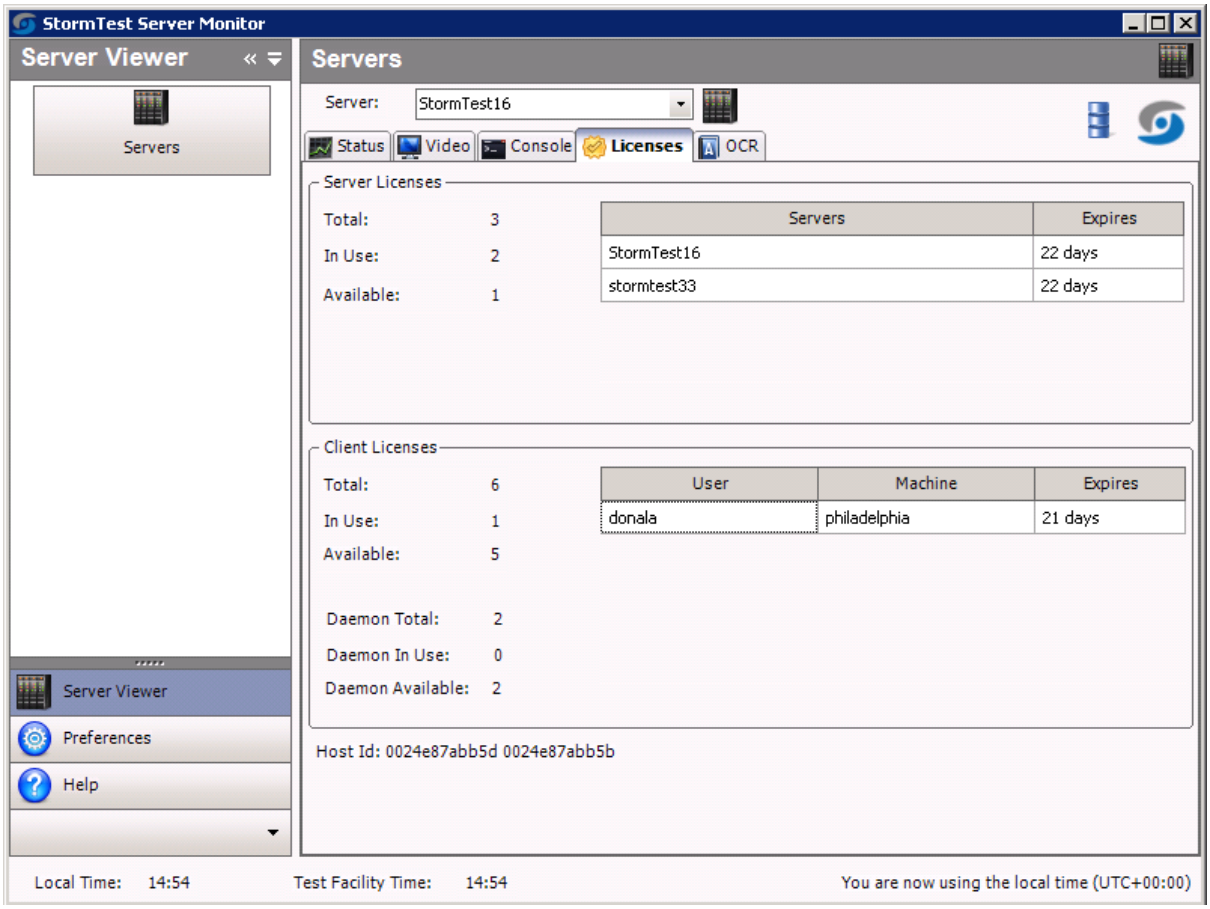


Figure 31 : Server viewer – license information

The license status will tell you how many server and client licenses are available, how many are in use and who (i.e. what user on what machine) is using them. An example license status window is shown above.

In this case, there are three server licenses, of which two are in use. There are also six client licenses and one is in use. There are two Client Daemon licences, of which none are currently in use. The server host id displayed at the bottom of the window is required for license generation and may be requested by an S3 Group support person.

The Console tab displays the server console and the OCR tab displays the OCR license information.

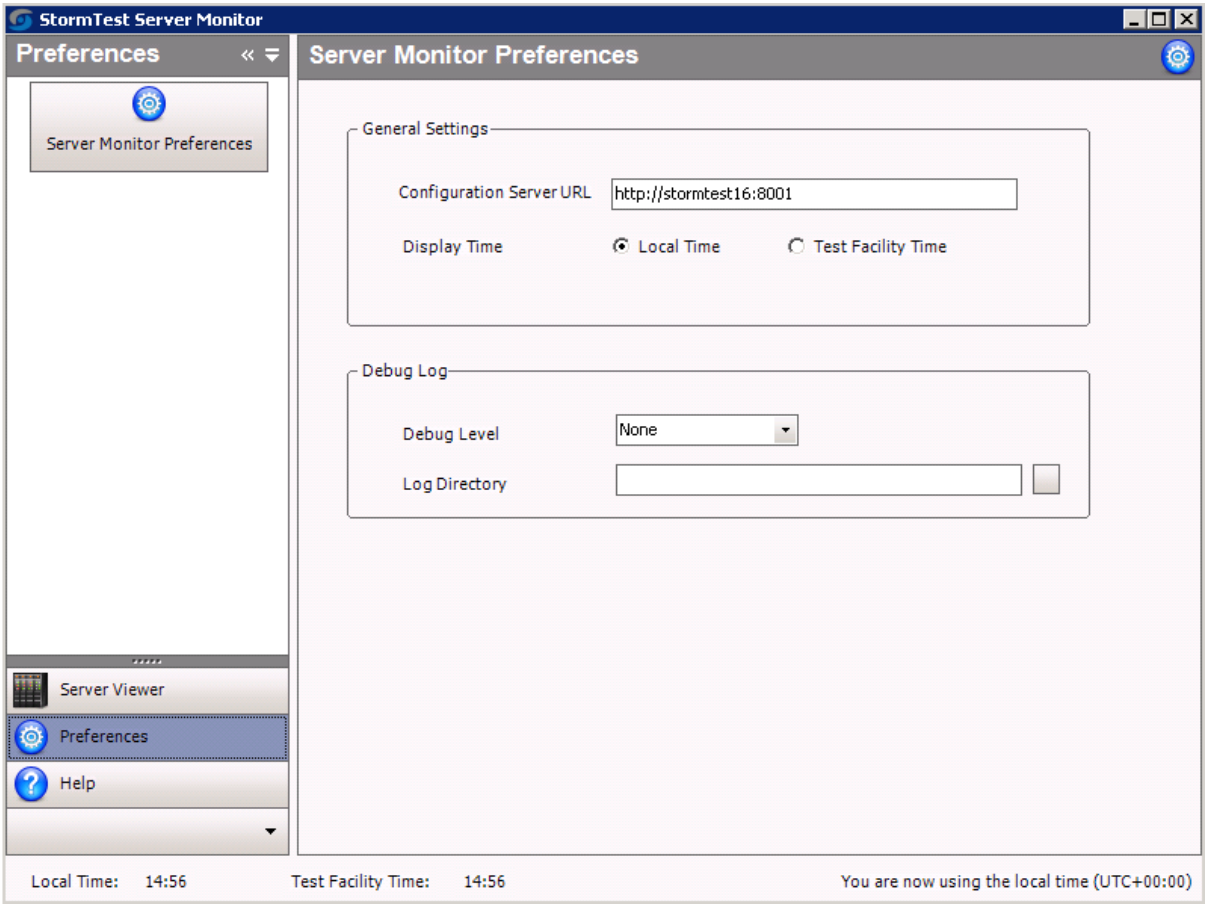


Figure 32 : Preference window

The *Preferences* window shown in Figure 32 allows a user to point the monitor application at a different configuration server. Since there should only be one configuration server for each facility, this setting should never need to be changed.

The user can also specify the output log directory if debugging is enabled.

More information on the StormTest Server Monitor can be found in the StormTest Server Monitor User Guide.

4 Main Server Configuration

For detail on the hardware configuration of your StormTest unit, refer to the appropriate Hardware guide. This section deals specifically with the software configuration of the servers shipped as part of the hardware.

For HV16 units, there is a Dell server installed which hosts the majority of the software for StormTest. The configuration of this server is critical to the operation of StormTest. There are also four video server units which are responsible for the video capture process.

For HV04/HV01 units, the server component and video capture function are combined. Like the HV16, the server's out of the box configuration is also critical to the operation of the unit.

4.1 Installing Server Drivers

Each StormTest installation relies on a number of third-party drivers to function correctly. These tools come pre-installed on each StormTest server, but in the event that the OS needs to be re-installed on the server, a complete image of the shipped OS and drivers is supplied with each StormTest system. If you need to re-image the server, please contact StormTest support for more information.

4.2 Installation of other applications on the StormTest Server

The StormTest software has been tested on the specific server configurations shipped with the StormTest systems. While it is possible to install other software on these servers, it is not recommended. In particular, virus scanner software has been known to interfere with the StormTest server software.

If you wish to install third party software on the StormTest servers, please inform StormTest support first as they may be able to advise if the particular software is likely to cause an issue.

Note that in any case, StormTest support will not be able to guarantee compatibility and any adverse effects will be at your own risk.

4.3 Dell Server Configuration

1. **Window Updates:** The latest windows updates are installed during manufacturing. To ensure window updates do not cause any unscheduled reboots or adversely affect the behaviour of the StormTest server software, the automatic Windows update option is disabled and set to the "notification" mode. A security policy to regularly apply updates should be implemented.
2. **Window Accounts**. StormTest by default comes with 2 windows Administrator accounts.

	Name	Password
1	Administrator	$tormTest
2	StormTestUser	user_pwd

Please note that these are default credentials used in all deployments. For security purposes, it is advised that the passwords be changed as part of the commissioning process.

3. **Antivirus**. No third-party antivirus software is installed or enabled.
4. **Firewall:** The firewall is enabled, however there are a number of ports which need to be open between the StormTest Client and Server. Typically, the StormTest client is installed on a PC that needs to communicate with the StormTest server/config server through a firewall. To enable this the following ports must be open:

Port Protocol	Direction	Comment
21 TCP/FTP	Client to Server	Client daemon log file access
80 TCP/HTTP	Client to Config Server	Admin console and Dev suite web applications
5050 TCP/RAW	Client to Server	Audio/Video stream
8000 TCP/HTTP	Client to Server	Control data
8001 TCP/HTTP	Client to Config Server	Facility data access
8002 TCP/HTTP	Client to Server	Daemon control and viewing remote video
8004 TCP/HTTP	Client to Config Server	Asynchronous notifications to the client
8005 TCP/HTTP	Server monitor to Server	Console log from server process
12001-12016 TCP/RAW	Client to Server	Serial data from STB
27000 TCP/HTTP	Client to Server	StormTest License access
32100 TCP/HTTP	Server to License Server	Access to the license server Daemon

4.4 Video Server Configuration

The four video servers in an HV16 are connected to the main Dell server via an internal switch and have no exposure to the external network.

1. **Window Updates:** The latest windows updates are installed during manufacturing. To ensure window updates do not cause any unscheduled reboots or adversely affect the behaviour of the StormTest server software, the automatic Windows update option is disabled and set to the “notification” mode. A security policy to regularly apply updates should be implemented.
2. **Window Accounts**. StormTest by default comes with 2 windows Administrator accounts.

	Name	Password
1	Administrator	$tormTest

2	StormTestUser	user_pwd

The PC is configured to AutoLogon to the account of user: StormTestUser.

3. **Antivirus**. No third party antivirus software is installed or enabled.
4. **Firewall:** The firewall is disabled.

5 TCP Ports used by StormTest

StormTest uses some pre-set port numbers for network communications. In the unlikely event of firewall issues, or other network problems, the ports used are listed here for easy reference.

5.1 StormTest Configuration Server

The StormTest configuration server listens on port **8001**. This can be configured by editing the windows registry key (of type String):

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\StormTestConfigServer\
BindAddresses
```

The default setting for this key is **http://*:8001/**.

Every StormTest client and server **must** be able to communicate via this port.

In addition, the StormTest Developer Suite application establishes a connection to the config server on port **8004** for asynchronous notifications. This can be configured using the registry key (of type DWORD):

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\StormTestConfigServer\
TcpListenerPort
```

5.2 StormTest Client Daemon

The Stormtest client daemon listens on port **8002** by default. This can be changed by editing registry key (of type String):

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\StormTest Client
Daemon\BindAddresses
```

The default value is **http://*:8002/daemon/**.

The StormTest configuration server should be able to access this port on all StormTest server PCs and any other PCs running the client daemon.

5.3 StormTest Server

For StormTest client scripts to run, the following ports must be open between the StormTest client and the StormTest server. Each of these is configurable through the StormTest Administration Console.

Purpose	Port Number
Server Communications	**8000**
Video Streaming	**5050**
Serial Information	**12001 - 12016**

Table 2 StormTest Server Ports

5.4 Firewall configuration

To summarise, if a StormTest client is installed on a PC that needs to communicate with the StormTest server/config server through a firewall, then the following ports must be opened:

Port	Protocol	Direction	Comment
21	TCP/FTP	Client to Server	Client daemon log file access
80	TCP/HTTP	Client to Config Server	Admin console and Dev suite web applications
5050	TCP/RAW	Client to Server	Audio/Video stream
8000	TCP/HTTP	Client to Server	Control data
8001	TCP/HTTP	Client to Config Server	Facility data access
8002	TCP/HTTP	Client to Server	Client Daemon status Web service API (config server only) Platform API
8004	TCP/RAW	Client to Config Server	Asynchronous notifications to the client
12001-12016	TCP/RAW	Client to Server	Serial data from DUT

Table 3 Firewall Configuration

For all the rows marked 'Client to Server' and 'Server monitor to Server', you will need a firewall rule to open the respective ports on **all** StormTest servers in your facility.