Installation Guide

CloudShell Version: 7.0.0.8538

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Quali

Legal notice

Contents

Overview

The CloudShell Suite 7.0 Installation Guide provides the installation requirements, hardware and software specifications, and the procedures for installing or upgrading to CloudShell 7.0.

This guide leads you through the installation wizard and directs you to the configuration options that need to be modified for your particular installation. It includes the following main topics:

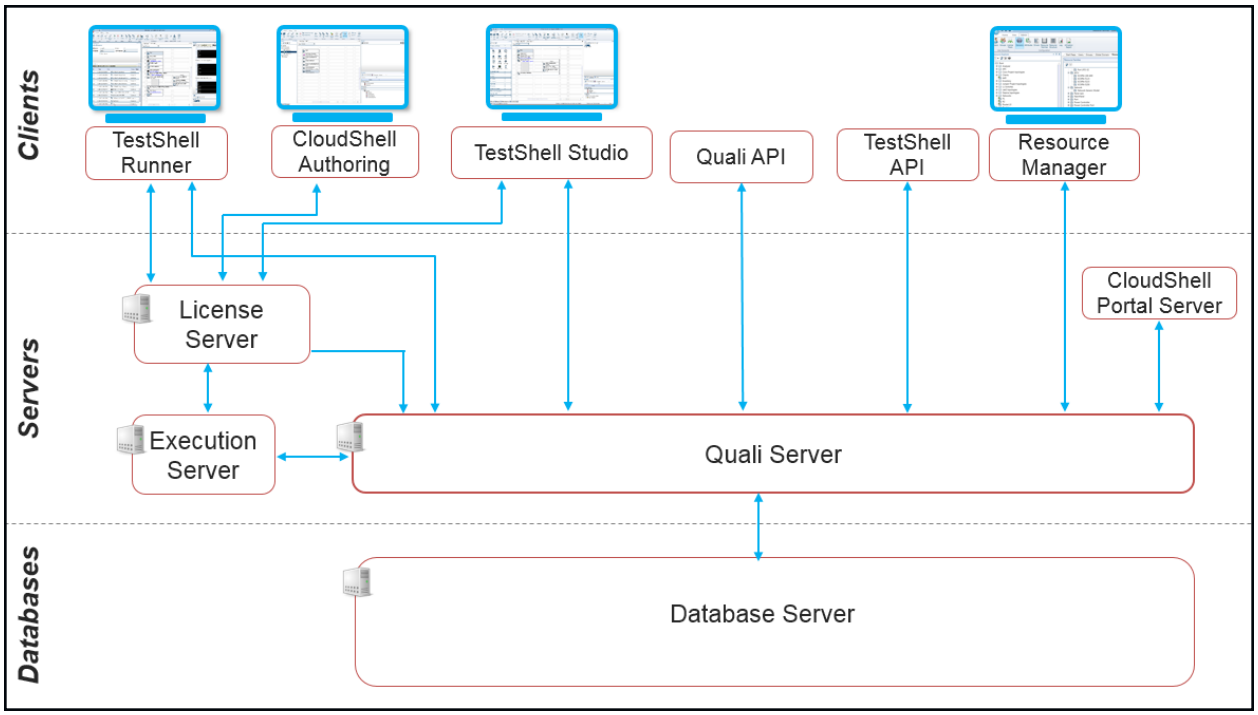
> Quick Installation: describes the steps required for a quick installation with default values.
>
> Upgrade Procedure: describes the steps required for upgrade.
>
> Complete Installation: describes the steps required for complete installation.
>
> Configure CloudShell Products: describes the steps required for post-installation product configurations.

What's Included with CloudShell 7.0

This section describes the various CloudShell components, servers, databases and utilities. The actual items that are installed depend on your selection during the installation procedure.

CloudShell Components

The CloudShell components are depicted in the following diagram.



The CloudShell components are described in the following table:

Component	Description
Quali Server	Runs the CloudShell framework and manages CloudShell data.
CloudShell Portal	A self-service web client that enables you to manage your Resources, create and manage Environments and Reservations, as well as manage and schedule your automated testing. You can leverage CloudShell's extensive automation capabilities to run Environment and Resource commands as well as automate business use cases within Reservations.
TestShell Execution Server	Runs commands and manages execution of tests from the Job Scheduling dashboard. The TestShell Execution Server also manages commands, such as, resource, service, environment, and power from CloudShell Portal. This component adds to CloudShell Portal's total execution capacity.
CloudShell Authoring	Code-free hardware interface editor for quick driver development for any environment, supporting full equipment interchangeability and automatic documentation for easy collaboration.
CloudShell Resource Management Client	Use CloudShell Resource Manager to manage resources and usage. For an example of using this component, see Import User Definitions from an Active Directory (Optional).
CloudShell Remote Runner	Executes CloudShell-specific automation steps or complete scenarios on remote stations, enabling the launch of any script or protocol on a remote machine, without requiring complex infrastructure.
TestShell Studio	Desktop applications for GUI based test authoring and execution. (Studio and Runner are automatically installed with TestShell Studio.)
CloudShell License Server	Manages network license distribution. The License Server can be installed on any machine, and should be installed before installing client components.
CloudShell Runtime	Supports the execution of CloudShell flows and drivers.
Quali API	The Quali API library provides access to job scheduling operations from outside of the Job Scheduling dashboard, as well as functions related to reservations, for example, Attach file to reservation and import and export of

Component	Description
	environments.
TestShell API	The TestShell API library comprises functions for interacting with Quali Server. For example, you can use API functions to create and configure resources, environments, routes, and reservations. This API library also provides a set of lab management batch operation functions.
CloudShell Sandbox API	The CloudShell Sandbox API allows to use CloudShell via software interfaces, for example, to develop and automate Continuous Integration/DevOps processes. For example, you can use API functions to view details about environments (blueprints) and reservations (sandboxes) related to a particular user domain and user permissions, and the available actions that can be performed on the environments (blueprints) and reservations (sandboxes)). The CloudShell Sandbox API service can be installed as a custom installation or as a standalone installation together with Resource Manager, and can be installed either on the same machine on which CloudShell Portal/Quali Server is installed, or on a different machine (see Install CloudShell Sandbox API).
Database Server	CloudShell is supported with SQL database. For more information, see Database Prerequisites.

Utilities and Drivers

CloudShell 7.0 also installs/upgrades the utilities and drivers described in Utilities and Layer 1 Drivers.

Remote Connections (Telnet, SSH, RDP) to CloudShell Resources

To support creating remote connections (Telnet, SSH, RDP) to resources in your CloudShell reservation (sandbox) directly from within the Internet browser, QualiX is available from the QualiSystems' Download Center from this link. Go to the Quali Latest Release section, and make sure to download and install the latest QualiX release version.

High Availability

A failover cluster is a group of independent servers (nodes) that work together to increase the availability and scalability of clustered nodes. The clustered nodes are connected by physical cables and

by software. If a disaster occurs and the active cluster node goes down, the clustering solution changes the active node automatically to the standby server and the Quali Server starts on the new active node.

To support the installation, configuration and deployment of high availability solutions in CloudShell, the following documents are available from the Solution Packs Download Center:

High Availability Installation and Configuration Guide	This document describes the installation and configuration of CloudShell in a High Availability (HA) environment.
High Availability Deployment Guide	This document presents the recommended architecture for implementing CloudShell in a High Availability (HA) environment.

System Requirements

This section describes the system requirements for the CloudShell components.

The requirements listed are those for a typical small installation with up to three active environments. For system requirements for other installation sizes, contact your QualiTechnical Account Manager.

Servers

Quali Server requirements

Requirements	Description
Software	
Windows	Any one of the following (including all variants): • 7 32 bit or 64 bit • Server 2008 R2 64 bit • Server 2012 64 bit • Server 2012 R2 64 bit • 8.0 and 8.1 • 10
SQL Server	Any one of the following: • SQL Server 2008 R2 SP2

Requirements	Description
	• SQL Server 2012 Standard edition • SQL Server 2014 Standard edition **Note:** Either SQL Server 2012 Enterprise or SQL Server 2014 Enterprise is required for the High Availability (HA) solution.
Hardware	
CPU	4 quad cores
RAM	A minimum of 8 GB
Hard Drive	An SSD drive is recommended for the database server Consult Quali support about the amount of required storage.
Network cards	1/10 GB, according to network load

TestShell Execution Server minimum requirements

Requirements	Description
Software	
Windows	Any one of the following: • 7 32 bit or 64 bit • Server 2008 R2 64 bit • Server 2012 64 bit • Server 2012 R2 64 bit • 8.0 and 8.1 • 10
Hardware	
CPU	4 quad cores
RAM	2 GB
Hard Drive	Minimum of 60GB for execution server only. HDD with a page-file capacity of 200 MB.

Note: TestShell Execution Server requirements vary according to the required usage. For example, in a scenario where 16 CPU intensive tests are run at any given time, an optimal environment would be a machine with 32 CPU cores, with capacity set to 16, or 2 machines with 16 CPU cores, with capacity set to 8 for each machine. In another scenario where 8 memory intensive tests are run at any given time, an optimal environment would be a machine with 16GB RAM, with capacity set to 8.

Client Applications

This section lists the requirements for the following client applications.

CloudShell Authoring

Requirements	Description
Operating System	Any one of the following: • Windows 7 (32/64 bit) • Windows Server 2008 R2 • Windows Server 2012 R2 64 bit • Windows 8.0 and 8.1 • Windows 10
Hardware	• CPU - dual core minimum • RAM - at least 4 GB

CloudShell Resource Management Client

Requirements	Description
Operating System	Any one of the following: • Windows 7 (32/64 bit) • Windows Server 2008 R2 • Windows Server 2012 R2 64 bit • Windows 8.0 and 8.1 • Windows 10
Hardware	• CPU - dual core minimum • RAM - at least 4 GB

Automation clients

Requirements	Description
Operating System	Any one of the following: • Windows 7 (32/64 bit) • Windows Server 2008 R2 • Windows Server 2012 R2 64 bit • Windows 10
Hardware	• CPU - dual core minimum • RAM - at least 4 GB

CloudShell Remote Runner

Requirements	Description
Operating System	Any one of the following: • Windows Vista • Windows 7 (32/64 bit) • Windows Server 2003 • Windows Server 2008 R2 • Windows Server 2012 R2 • Windows 10 • Red Hat Enterprise • Linux 5.x (32-bit) • Fedora 7-9 • Ubuntu 6.06-8.04
Hardware	No special requirements

CloudShell Required Ports

This section describes the ports that are required by CloudShell.

CloudShell required ports (available for use, but not configurable)

The following table describes the required ports that are available for use, but not configurable.

Port	Server app (inbound)	Client app (outbound)	TCP/ UDP	Description
8023	Quali Server	Studio, Runner	TCP	Upload/download files/reports from the service
8027	Quali Configuration	Quali Configuration	TCP	Used to configure the CloudShell Sandbox API Gateway
8028	Quali Server	All CloudShell clients	TCP	For user administration via Studio, Runner, Resource Management Client, TestShell API
8030	Quali Server	Studio, Runner	TCP	Handles Studio HTTP requests
8031	Quali Server	Execution Server	TCP	Opened for incoming connections on the Quali Server. Used by Execution Servers to communicate with the Quali Server.
8033	CloudShell Server Proxy	Quali Proxy	TCP (HTTP)	Provides access to the proxy via HTTP protocol, used by CloudShell Portal
8034	Quali REST API	Quali Server	TCP (HTTP)	Provides access to the Quali Server via HTTP protocol, used by the CloudShell Server Proxy

Port	Server app (inbound)	Client app (outbound)	TCP/ UDP	Description
9300	Elastic Search	None	TCP	For communication with other nodes in the cluster
9200	Search	None	TCP	For Quali Server searches
Any	Prism web	None	TCP (HTTP)	For communication with the Prism web
5093	License Server	All CloudShell products	UDP	License Server computer
49263 to 65535	Studio, Runner	None	TCP	Used by Studio HTTP server, handles report attachments
8101	Remote Runner	Studio, Runner	TCP	Allows Studio/Runner to send scripts to CloudShell Remote Runner
8050 to 65535	Runner	API	TCP	For Runner API requests (when in external control)

CloudShell required ports (configurable)

The following tables (Quali Server, CloudShell Portal, and Sisense/CloudShell Insight) list the required ports that are configurable. Most of these ports can be configured in the CloudShell Configuration Wizard (unless stated otherwise). For more information, see Install CloudShell.

Quali Server

Port	Server app (inbound)	Client app (outbound)	Configuration	TCP/ UDP	Description
9000	REST	Quali API	Use the	TCP	For Quali

Port	Server app (inbound)	Client app (outbound)	Configuration	TCP/ UDP	Description
			QualiApi.Port key in the Server's customer.config file		REST API requests
8029	XMLRPC	CloudShell API	Use the APIHostPort key in the Server's customer.config file	TCP	For CloudShell XMLRPC and TCL API requests.
25	External SMTP mail server	Quali Server	Use the CloudShell Configuration Wizard	TCP	Allows the Quali Server to send mail notifications

CloudShell Portal

Port	Server app (inbound)	Client app (out bound)	Configuration	TCP/ UDP	Description
82	CloudShell Sandbox API	Browsers	Use the CloudShell Configuration Wizard	TCP (HTTP)	Provides access to the CloudShell Sandbox API using HTTP protocol
81	CloudShell Portal	None	Use the CloudShell Configuration Wizard	TCP (HTTP)	Provides access to CloudShell Portal using HTTP protocol, when using IIS Express

Port	Server app (inbound)	Client app (out bound)	Configuration	TCP/ UDP	Description
80	CloudShell Portal	None	Use the IIS Manager	TCP (HTTP)	Provides access to CloudShell Portal using HTTP protocol
443	CloudShell Portal	None	Use the IIS Manager	TCP (HTTPS)	Provides access to CloudShell Portal using HTTPS protocol

Sisense/CloudShell Insight

Port	Server app (inbound)	Client app (outbound)	Configuration	TCP/ UDP	Description
8083	Insight	None	Use the BiHost key in the CloudShell Portal customer.config file	TCP (HTTP)	BI integration

3rd Party Software

This section describes the 3rd Party software that is required, optional, and supported by CloudShell.

Note: Administrator-level permission is necessary when installing 3rd Party software that is required by CloudShell.

Required

- IIS Express v8.0 (Required for using CloudShell Portal)
- Microsoft .NET Framework 4.0
- Microsoft Visual C++ Runtime 9.0
- Microsoft Visual C++ Runtime 10.0
- Microsoft Windows Installer 4.5
- Python 2.7
- VCTools++ (For all users. Required for compiling Python dependencies)

If any of the above 3rd Party components are missing from your computer, the CloudShell installation wizard installs them before installing the CloudShell application.

Optional

- Studio, Driver Builder: LabView runtime and LabView tools are available as a separate installation.
- Insight: CloudShell 7.0 Insight is available as a separate installation.
- Microsoft PowerShell version 2: Install this when using the command shell tool.
- Ranorex version 5.1.3: Install this when using the GUI Automator.

Note: When using Ranorex with certain browsers, you might have to install a plugin. For example, the Ranorex plugin for Chrome is available at this link.

Supported

- Source control: CloudShell 7.0 has been tested with TortoiseSVN Version 1.7/1.7.9
- BI tools: Sisense 5.7.x (supported only on 64-bit operating systems)
- Quality control:
  - HP Quality Center QC10. For deployment information, see CloudShell knowledge base > Automation execution > Integration with Quality Center > QC 10 > Integrating CloudShell with QC10.
  - HP Quality Center QC11. For deployment information, see CloudShell knowledge base > Automation execution > Integration with Quality Center > QC 11 > Installing the CloudShell plugin.

Database Prerequisites

CloudShell applications can work with SQL database.

SQL database user permissions

Provide Windows users with the following SQL server roles:

- bulkadmin
- dbcreator
- processadmin
- public
- setupadmin

In addition, also provide a specific permission to "Connect to SQL" that is granted manually in the "Securables" section of the user's login properties.

For a detailed list of SQL server roles, see Fixed server roles.

Installation requirements for SQL databases

The required components must be installed in the following order:

Component	Installation instructions
Standard edition of one of the following: • SQL Server 2008 • SQL Server 2012 • SQL Server 2014 -or- • SQL Server 2008 Express • SQL Server 2012 Express	• Where there is an existing SQL server installed on the organization's network, it is recommended that this is used • For a standalone installation, if the CloudShell installer cannot find Microsoft SQL Server or Microsoft SQL Server Express on the destination environment, Microsoft SQL Server Express is installed automatically as part of the installation procedure. **Note:** There is a limitation of the maximum database size, per database, of 4 GB for SQL Server 2008 Express and 10 GB in SQL Server 2012. For further information, see SQL Server Express Overview and FILESTREAM Compatibility with Other SQL Server Features.
Quali Server	• The Quali Server can be located anywhere on the organization's network. • For a standalone installation, the Quali Server is installed on the same machine as the clients and

Component	Installation instructions
	the database.
CloudShell applications	Quali Server, SQL server or SQL Express, and the CloudShell applications can be installed on the same machine, or on separate machines in the same network.

Software and Utilities Recommendations

For working with the automation applications

The 64-bit version of CloudShell is recommended (requires a 64-bit version of Windows).

For working with elastic search

The 64-bit version of Java is required when using a 64-bit version of Windows.

For the SNMP manager tool

An external MIB browser is recommended.

For working with the traffic libraries

Appropriate traffic generator applications must be installed.

For working with CloudShell Portal

Browser	Minimum	Maximum
Microsoft Edge	20.10240.16384.0	20.10240.16384.0
Microsoft IE	10.0.8400	11.0.19
Chrome	43.02357.81	48.0.2564.116
Firefox	38.05	44.0.2
Safari	5.1.7	5.1.7

Network Recommendations

Switches/Routers/LANS	A 1GB connection is highly recommended.
WAN	Network bandwidth with high quality of service is required for VPN connectivity and multi-site implementations.

Security Recommendations

User permissions	Administrator access is required for all test stations/servers.

Performance Considerations

CPU usage	CPU usage by external applications may impact CloudShell performance.

Quick Installation

Use this quick procedure to guide you to install CloudShell as a standalone installation with a Microsoft SQL Server 2008 Express R2 database.

Note: This procedure is suitable if this is first time that CloudShell is being installed on your machine. Otherwise, follow the upgrade procedure, see Upgrade Procedure.

Before You Begin

Ensure that your machine has the minimum system requirements, as listed in the following tables. The requirements listed are those for a typical small installation with up to three active environments.

Operating system

Windows	Any one of the following: • 7 32 bit and 64 bit • Server 2008 R2 64 bit • Server 2012 64 bit • Server 2012 R2 64 bit • 8.0 and 8.1 • 10

Hardware

CPU	4 quad cores
RAM	A minimum of 8 GB

Install CloudShell in a Quick Procedure

The Installation wizard checks for missing prerequisite components and installs them as part of the installation process.

To install CloudShell in a quick procedure:

1. Download the installation package for CloudShell 7.0 from Quali Download Center and save it to a temporary directory.
2. Navigate to the temporary directory and from the installation package, double-click `setup.exe`.
3. If prerequisite components are not installed, you are prompted to install them. Click **OK**.
4. In the **Welcome** window, click **Next**.
5. Accept the license and click **Next**.

   To apply a license using an activation code, see Get a license file.
6. In the **Type of Installation** window, specify the **Standalone** installation type and click **Next**.
7. In the **Component selection** window, select all the components and click **Next**.
8. In the **Destination folder** window, accept the default or modify it, as required. Click **Next**.
9. In the **IIS configuration** window, select the **Set IIS Express** option. You can accept the default port value or specify a port. Click **Next**.
10. Follow the prompts of the installation wizard, accepting the default values.

    The CloudShell Configuration Wizard launches automatically when the respective CloudShell applications have been installed. Follow the prompts of the CloudShell Configuration Wizard to configure, in succession, each selected CloudShell application.

Upgrade Procedure

This section describes the required steps to upgrade to the latest version of CloudShell.

Note: A new license is needed for every upgrade to a major CloudShell version.

Upgrading to version 7.0 EA is supported from the following versions:

- 6.4 GA (and patches)
- 6.3 GA (and patches)
- 6.2.3 GA (and patches)

When upgrading from versions earlier than 6.2.3 GA, you must first upgrade to one of the above versions and then to 7.0 EA.

Note: Patches must be installed on GA versions only. Installing a patch on a non-GA version will result in unexpected behavior which may corrupt the database.

Before running the installer, uninstall the CloudShell Resource Management Client from any non-admin machines.

Note: Stop the service to avoid data change.

Upgrade Preparation

Back Up and Restore CloudShell

To backup and restore CloudShell:

1. Make sure all the users are logged off and that the CloudShell applications are not running.
2. Shut down CloudShell services in the Production environment, including the IIS Service and any web service connection to the databases.
3. Perform a backup of the schemas.
4. Restart CloudShell services, IIS and web services in the production environment (CloudShell Service first and then the rest).
5. Copy the backup files to the Development environment.

6. Shut down CloudShell services in the Development environment including the IIS Service and any web service connection to the databases.
7. Restore the backup files into the existing schemas.
8. Restart CloudShell services in the Development environment (first restart the CloudShell Service and then the remainder).

Proceed to Upgrade the Validation Environment.

Upgrade the Validation Environment

The purpose of installing the CloudShell upgrade on a standalone environment is to ensure that the new version functions correctly under your organization-specific environment.

Note: Quali recommends that you validate the organization-specific environment before upgrading CloudShell.

The validation stage checks for:

- Environment-specific installation errors
- Environment-specific compatibility issues

What you need for this stage

- CloudShell installation files
- 3rd party installation files
- Database management application
- Standalone environment for validation
- Temporary license

CloudShell installation files

You need the installation package for the CloudShell implementation, and the installation package for the current implementation.

You can get the latest CloudShell version from your ftp account at ftp.qualisystems.com.

Contact Quali Customer Support through the Quali Support Center if you need to download older installation files.

3rd party installation files

Get the installation files of the 3rd party tools being used with CloudShell on your production environment, for example:

- Traffic Generator GUI application (Ixia, Spirent, and so on)
- Ranorex 5.1.3 - Older versions of Ranorex must be upgraded to continue using the GUI tools.

Database management application

For example:

- SQLPlus
- SQL Management Studio

Standalone environment for validation

Ideally, the validation environment is identical to your production environment.

Some guidelines:

- Consider using virtual machines and/or terminal server if your production is a virtualized one.
- Aim to use the same hardware sets, same OS versions, same database brand and version, and so on. The purpose is to be able to find all environment-related issues using this environment. You need at least two machines: one for the Quali Server and one for the client applications.
- Make sure that the different devices that are being used by CloudShell are available for your validation stage. That includes traffic generators, L1 switches, other switches, and so on.

Note: If a device is being used by the production environment, it cannot be used in the standalone environment at the same time – this is extremely important when dealing with L1 switches.

Temporary license

1. To activate CloudShell on the validation environment, you need a license.
2. Run the CloudShell installer or the fingerprint application and get the fingerprint information of your machines.
3. Send a license request with this information to Quali Customer Support through the Quali Support Center.

Validation Environment Upgrade Procedure

Perform a full backup of CloudShell's database from the Production environment and save the backup files for later use.

The files are used to copy the production database information to the standalone environment as a backup for the production database in case a rollback is required.

In a virtualized environment, consider creating an image of the Quali Server and client machines for a quick and easy rollback in case it is needed.

In the validation environment:

1. Follow the Installation Guide and install the same CloudShell version that is currently installed on your production environment.
2. Install the 3rd party applications (Traffic Generator GUI applications, Ranorex, and so on).
3. Install a database management application.
4. Restore the production environment database files.
5. Activate CloudShell and verify that all applications are functional.
6. In Resource Manager, perform the following steps:
    a. Verify that all resources exist in the Resource Explorer.
    b. Verify that you can create, edit, and delete reservations and activate environments.
    c. Verify that resources can launch commands and applications.

    Note: Make sure your validation environment is ready before continuing to the next step.

7. If you are using an L1 switch in your environment, stop usage of any L1 switches that are shared with the production environment.

    An L1 switch can be controlled only by a single Quali Server at any time. Since the L1 switch is usually a shared resource between the production and validation environments, it is required to stop the usage of the L1 switch on the production environment, before using it in the validation environment. That includes closing all Resource Manager Client applications and any driver projects that use the TestShell API library.
8. Run the `setup.exe` file to perform the upgrade.

Proceed to Upgrade the Production Environment.

Upgrade the Production Environment

When upgrading the production environment, the working procedures from the validation upgrade are repeated, see Upgrade the Validation Environment.

What you need for this stage

CloudShell installation files

Use the files from the validation step, see Validation Environment Upgrade Procedure.

Prepare the production environment

All users should be logged off from the production machine, and the work on this machine should be suspended until the procedure is completed.

Acquire a permanent license

To activate CloudShell on the validation environment, you need a license. For more information, see Select a CloudShell License.

To acquire a permanent license:

1. Run the CloudShell installer or the fingerprint application and get the fingerprint information of your machines.
2. Send a license request with this information to Quali Customer Support through the Quali Support Center.

Production environment upgrade procedure

Follow the upgrade procedure that was used to upgrade the validation environment. For more information, see Validation Environment Upgrade Procedure.

Complete Installation

This section describes the complete CloudShell installation procedure.

For information about upgrades, see Upgrade Procedure.

Note: Installation of CloudShell requires administrator-level permissions.

Installation Checklist

The list below describes the complete installation and configuration procedure. It is recommended to follow the steps described in the list to ensure a complete and correct installation.

#	For information about:	See this section:
	Read the Installation known issues topic	Known Installation Issues
	Review the hardware/software requirements	System Requirements
	Review the prerequisites for running CloudShell with SQL server	Installation requirements for SQL databases
	Review the supported and required 3rd party software	Required and Supported 3rd Party Software
	Follow the backup recommendations	Back Up and Restore CloudShell
	Download the installation files	Download CloudShell 7.0 Installation Files
	Install the system	Install CloudShell 7.0
	Configure the system	Configure CloudShell Products
	Validate and verify the installation	Installation Validation Procedure

Download CloudShell 7.0 Installation Files

The installation packages for CloudShell 7.0 are available from the QualiSystems' Download Center.

For each file you can find the associated .md5 checksum which enables you to verify its authenticity.

Note: Registration to the Quali Support Center is required. If you have not registered, click this link to register New registration.

Install CloudShell 7.0

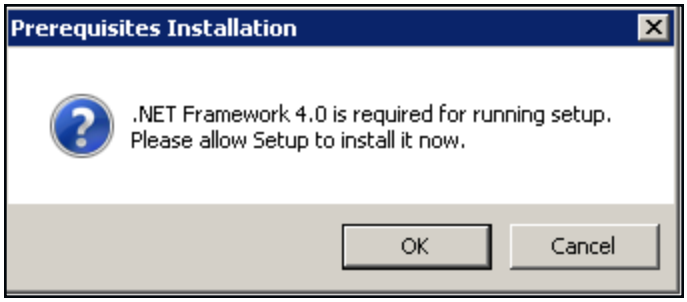
You can perform the full installation of the CloudShell Suite or, optionally, while running the installation procedure, you can choose to install one or more of the CloudShell Suite components.

The Installation wizard checks for missing prerequisite components as part of the installation process. For example, the installation wizard prompts you to install .NET Framework 4.0 and Microsoft Visual C++ 2010 Runtime if they are not already installed.

Install CloudShell

To install CloudShell 7.0:

1. From the installation package, double-click the `setup.exe` file.
2. If .NET Framework 4.0 is not installed on your machine, the installation procedure prompts you to install it.



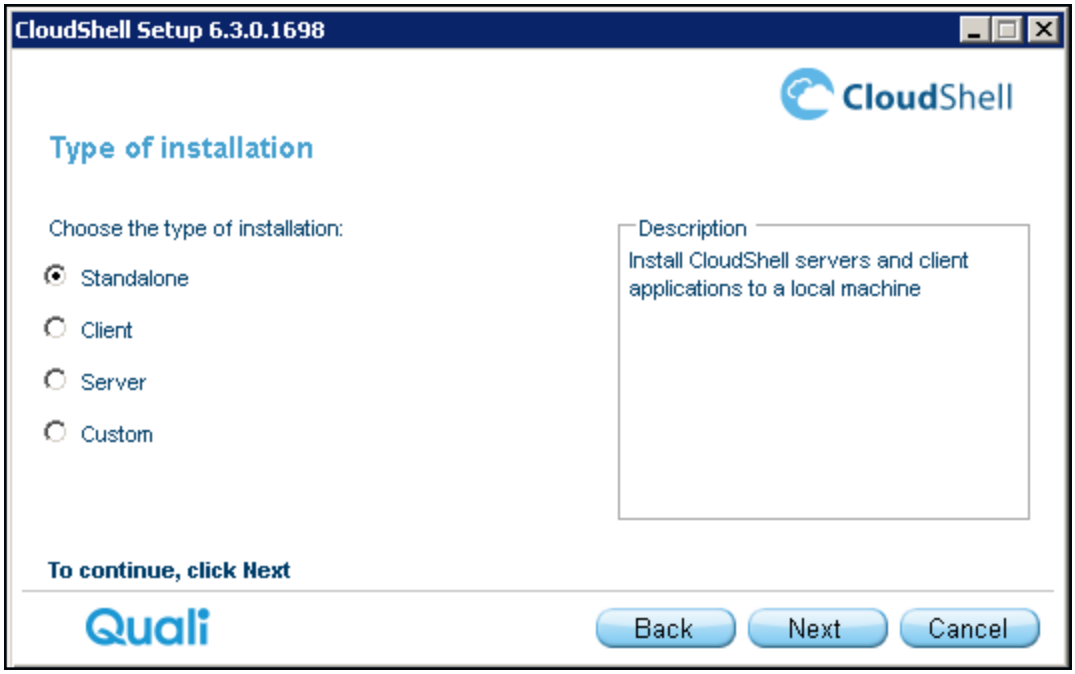
3. Click **OK** to install .NET Framework 4.0.

   When the .NET Framework is installed, the CloudShell Installation wizard starts.

4. In the CloudShell Installation wizard, click **Next** to open the CloudShell_Installationtype License Agreement.
5. In the **CloudShell License Agreement** window, select the **I accept the terms of the license agreement** check box.
6. Click **Next** to choose the type of installation and proceed to Select an Installation Option.

Select an Installation Option

1. In the **Type of Installation** window, specify which installation to run and click **Next** to choose which components to install.

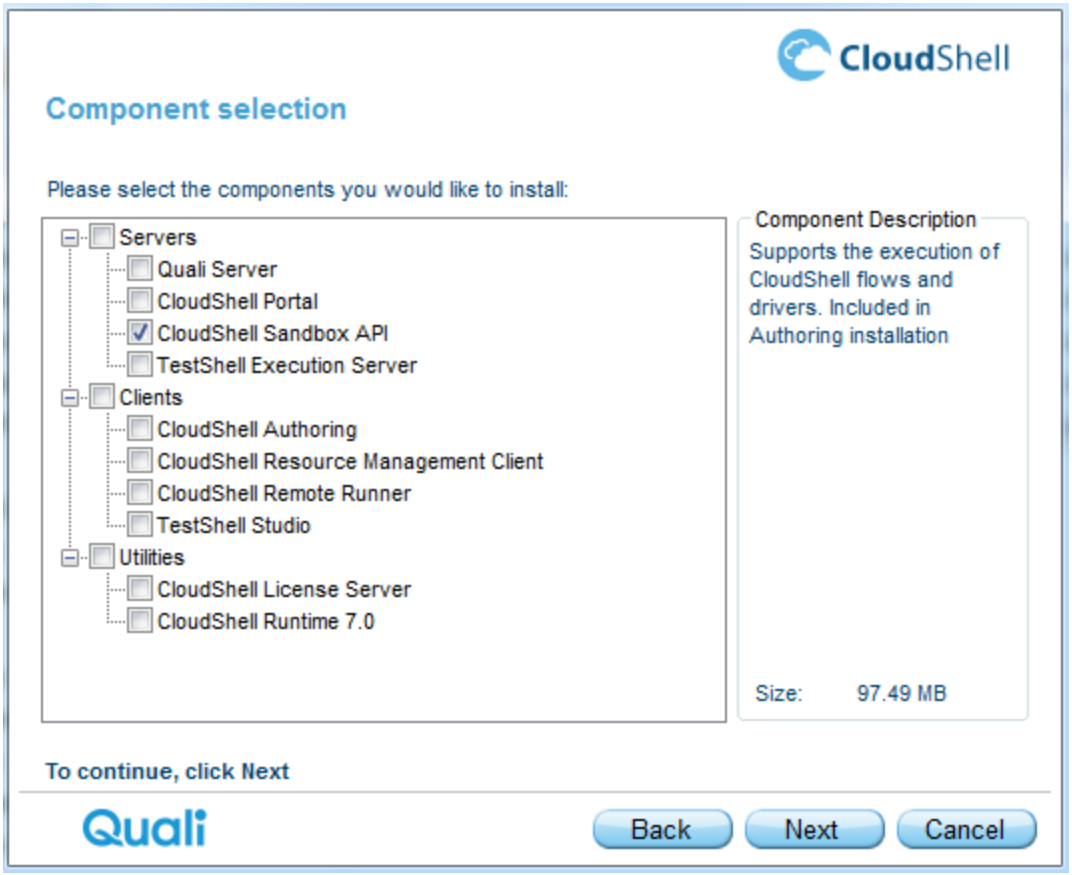


The CloudShell installation types are listed in the following table. For the purposes of this procedure, Standalone is selected.

Installation type	Description
Standalone	Choose Standalone to install the client and server applications on a single machine. During the Standalone installation, SQL Express Server 2008 or 2012 is installed in a separate instance and all required databases are created automatically on that server.
Client	Choose Client installation if the Quali Server has been centrally installed on your network. This enables you to customize your installation and install the necessary local components. The Client installation installs one or more selected clients on a local machine.
Server	Choose Server installation to install the server applications. You can choose to install the Quali Server and the CloudShell Portal on separate machines.
Custom	Choose Custom installation to manually select installation components.

Installation type	Description
	For more information about the available installation components, see CloudShell components.

For example, if **Custom** is chosen, select the components that you need to install, as required.



For example, see Install CloudShell Sandbox API which describes how to install the CloudShell Sandbox API, which can be installed either via Standalone or Custom installation.

2. After you have specified which installation type to run, click **Next** and proceed to Specify which CloudShell Components to Install.

Install CloudShell Sandbox API

You need to install the CloudShell Sandbox API service in order to be able to use the CloudShell Sandbox API to use CloudShell via software interfaces, for example, to develop and automate Continuous Integration/DevOps processes.

To install the CloudShell Sandbox API service:

1. In the **Type of Installation** window, specify the installation type.
2. For a custom installation, select **Custom**, click Next, and in the **Component selection** window, select the **CloudShell API** option.

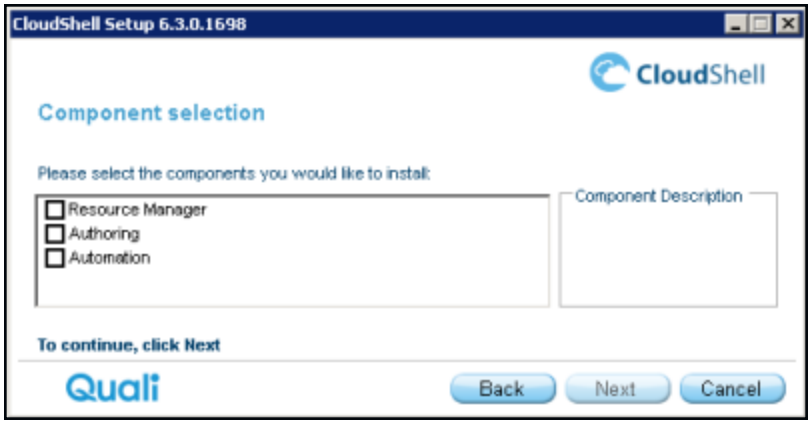
   -or-

   For a standalone installation, select **Standalone**, click **Next**, and select **Resource Manager**. The CloudShell Sandbox API is automatically installed together with the Resource Manager.

Note: You can install the CloudShell Sandbox API service either on the same machine on which CloudShell Portal/Quali Server is installed, or on a different machine, and you can install several instances of this service on several machines. For configuration details, see Configure CloudShell Sandbox API.

Specify which CloudShell Components to Install

1. In the **Component selection** window, specify which components to install.



   The available components are listed in the following table.

Installation type	Description
Resource Manager	Choose Resource Manager to install the CloudShell Resource Management Client.
Authoring	Choose Authoring installation to provide a code-free hardware interface editor for quick driver development for any environment, supporting full equipment interchangeability and automatic documentation for easy collaboration.
Automation	Choose Automation installation to install all required components for

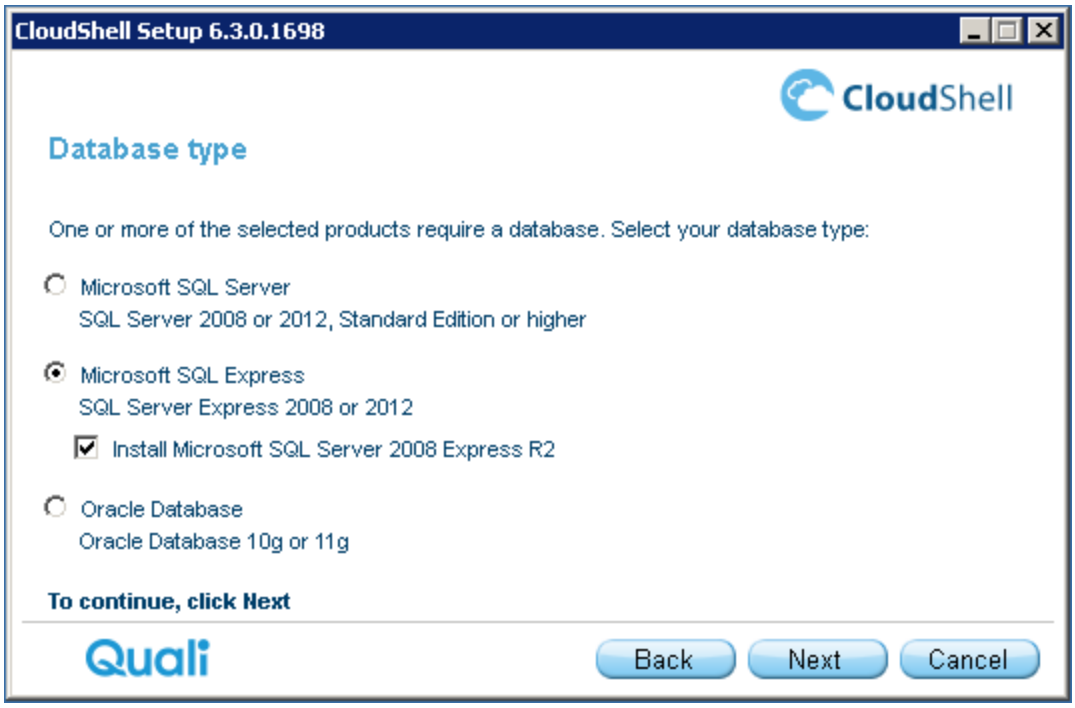
Installation type	Description
	running TestShell Studio locally on this machine. If an SQL server is not already installed, the installation includes SQL Server 2008 Express R2.

For the purposes of this sample procedure, all the components are selected.

2. Click **Next** and proceed to Specify the Database Type.

Specify the Database Type

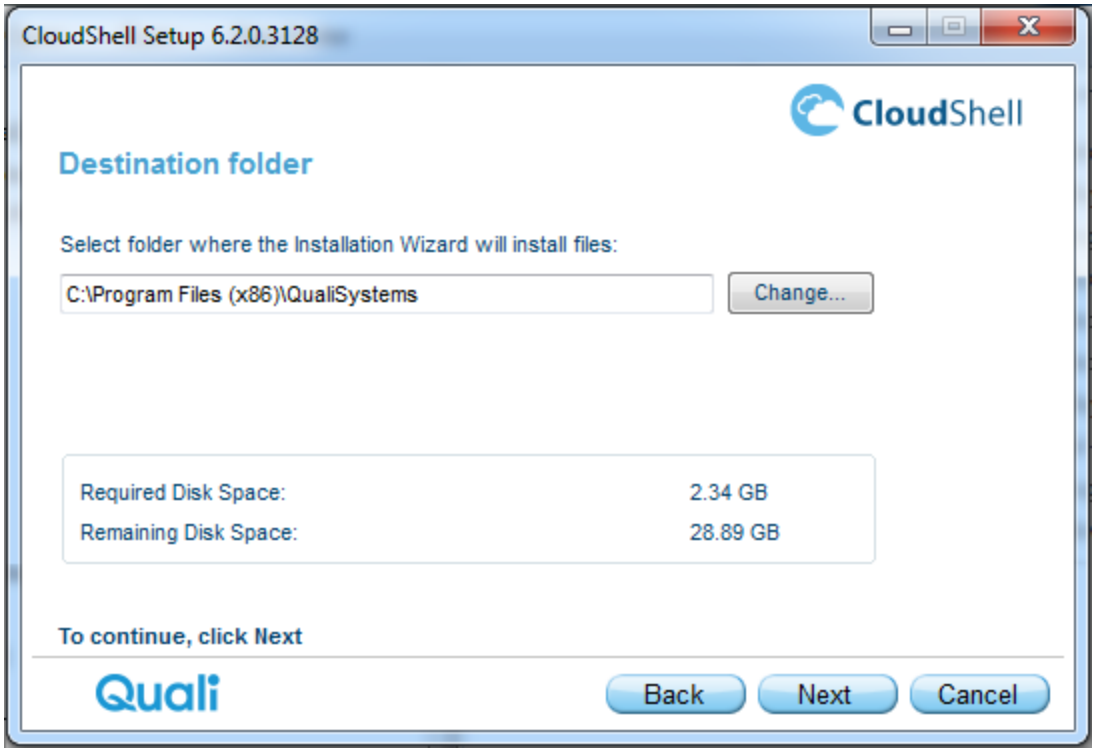
1. In the **Database Type** window, specify which database to use with CloudShell and click **Next** to specify the destination folder. For detailed instructions, see Configure the Database Connection.



2. If no database server is installed or is not available from a remote machine, select the **Microsoft SQL Express** option and then select **Install Microsoft SQL Server 2008 Express R2** to allow CloudShell to install an express database.
3. Click **Next** and proceed to Select Where to Install CloudShell.

Select Where to Install CloudShell

1. In the **Destination Folder** window, specify where to install the CloudShell applications and click **Next** to start the status check for required components.



2. Specify the default path and folder to which CloudShell is installed. The following paths are used for this procedure:

   `C:\Program Files\QualiSystems` (for 32-bit systems)

   `C:\Program Files(x86)\QualiSystems` (for 64-bit systems)

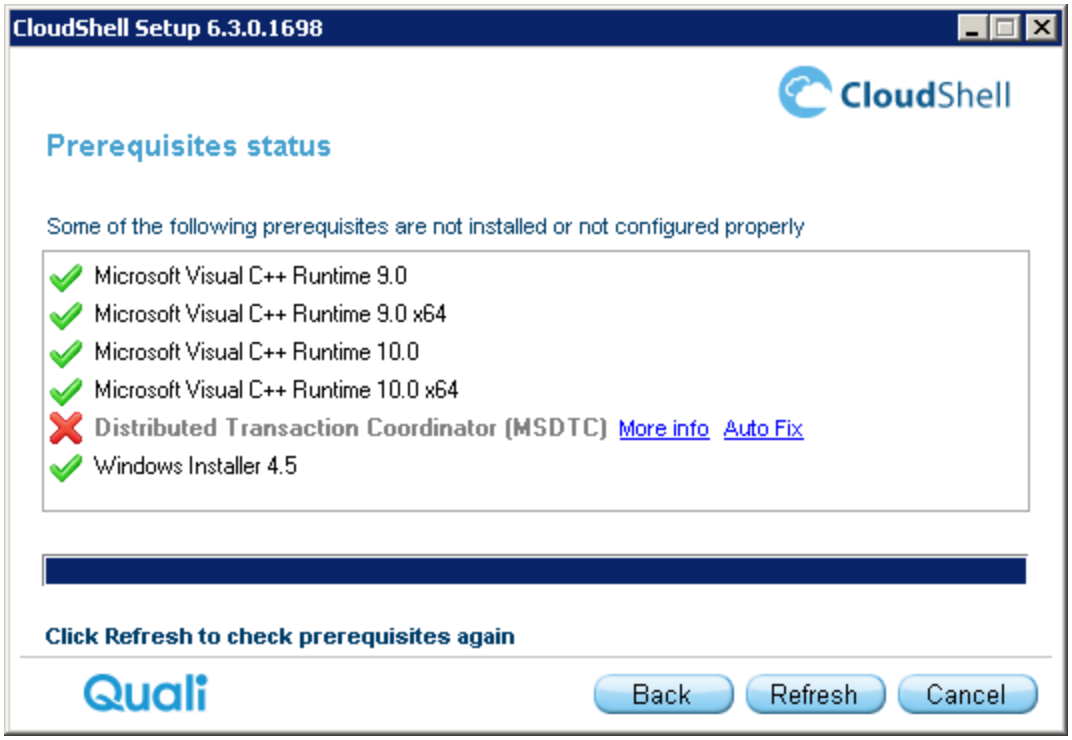
   If you need to install to a different installation path and folder, click **Change**.

3. Click **Next** and proceed to Check for CloudShell Required Components.

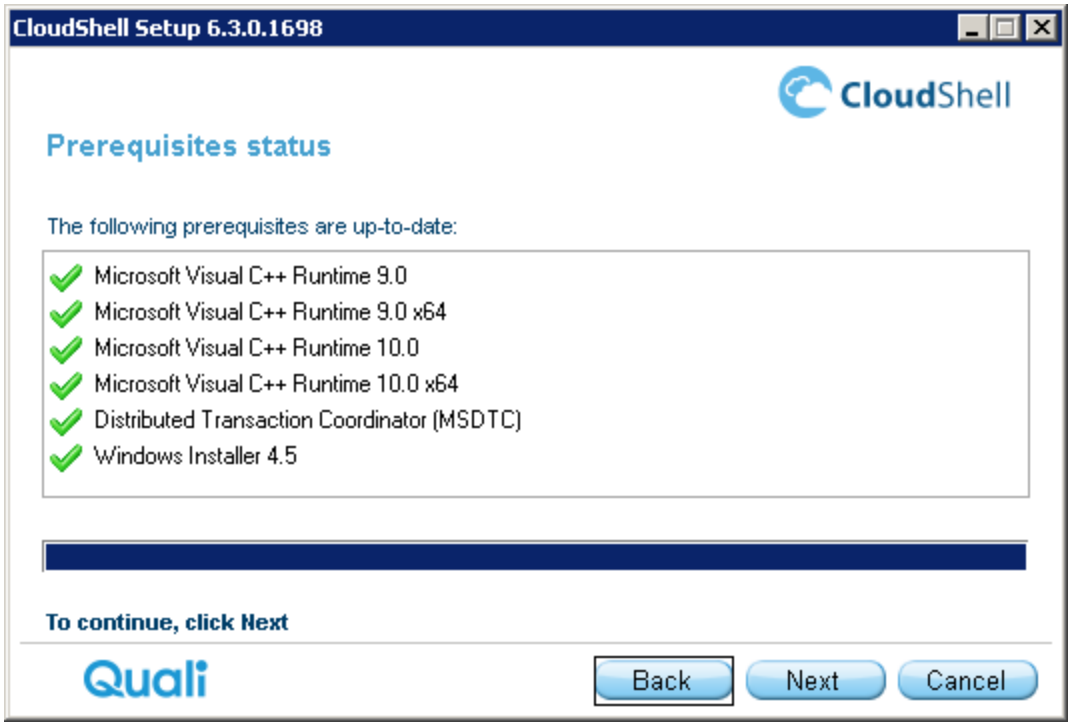
Check for CloudShell Required Components

1. In the **Prerequisites Status** window, the installation wizard lists the status of all required CloudShell components.
2. If a specific prerequisite is not configured correctly, ✖ sign appears near its row.
   - Click **More info** to see additional information about the problem.

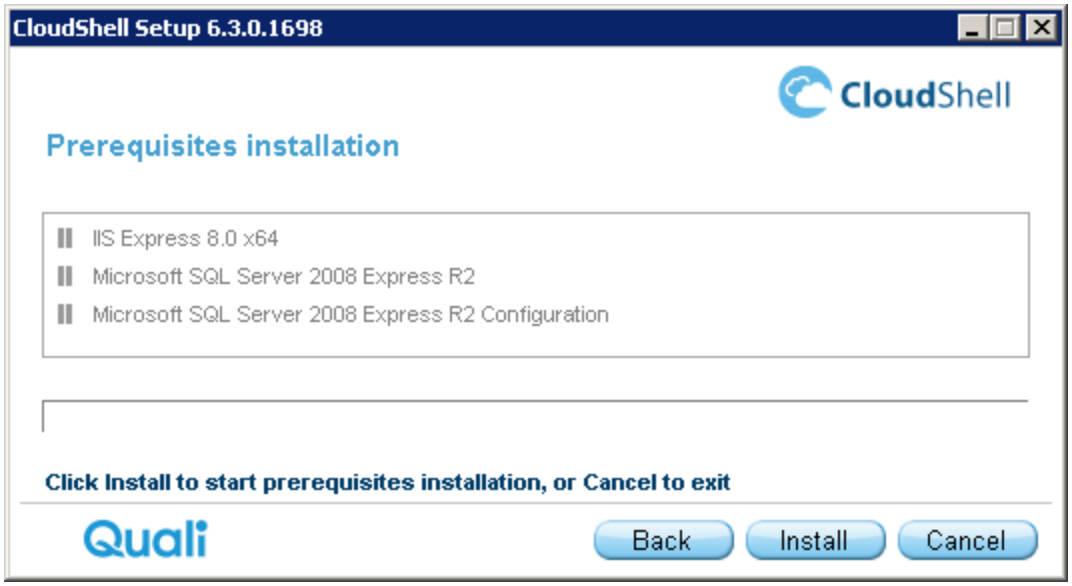
- Click **Auto Fix** to allow the Installer to fix the problem.



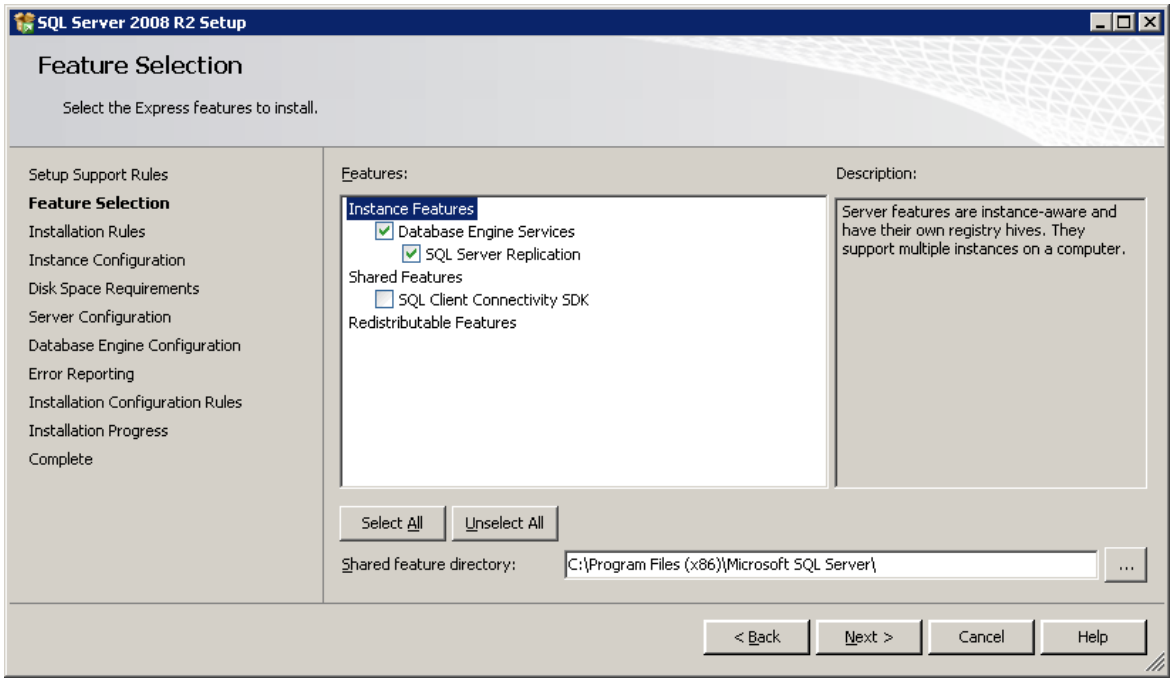
3. To ensure that all the corrections are attended to, click **Refresh**.



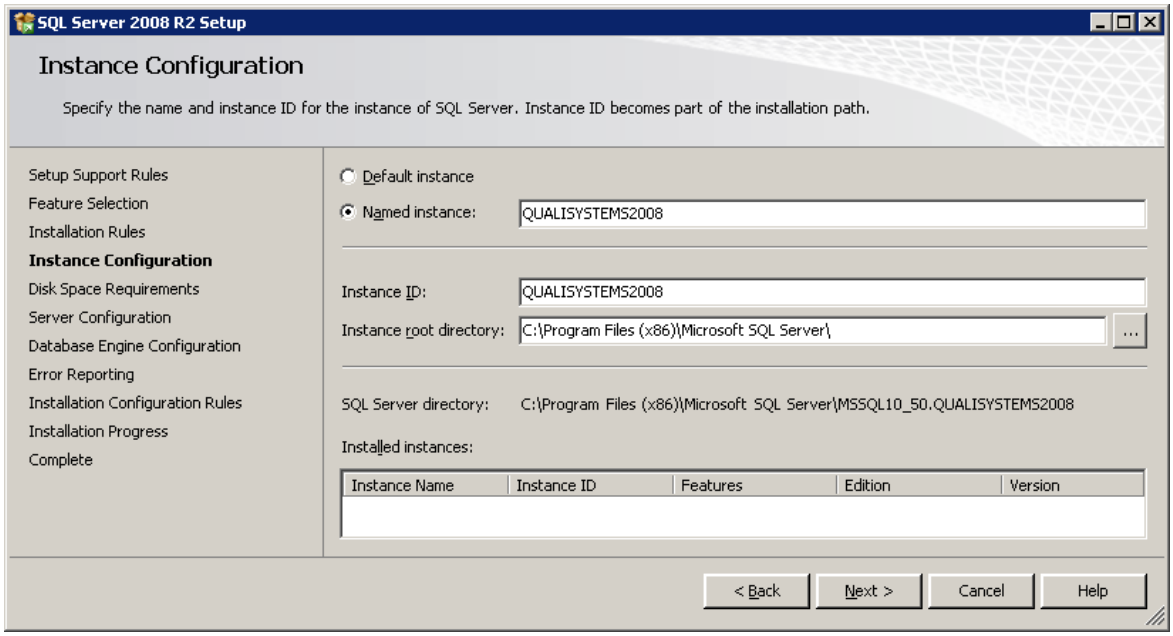
4. Click **Next**.



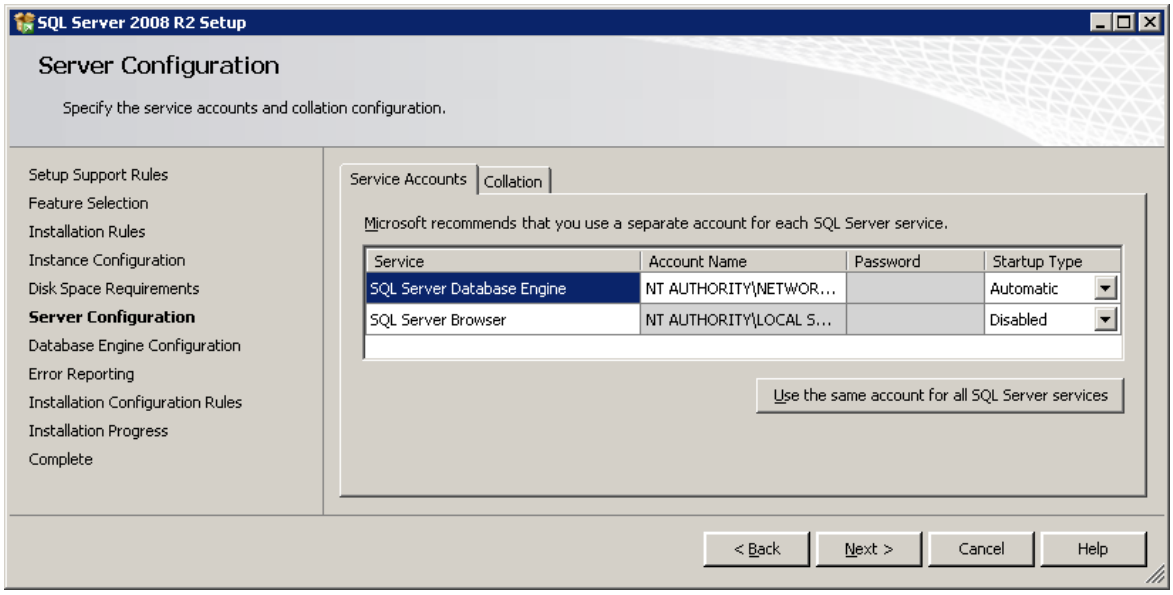
5. Click **Install**. The installation procedure commences with the database installation.



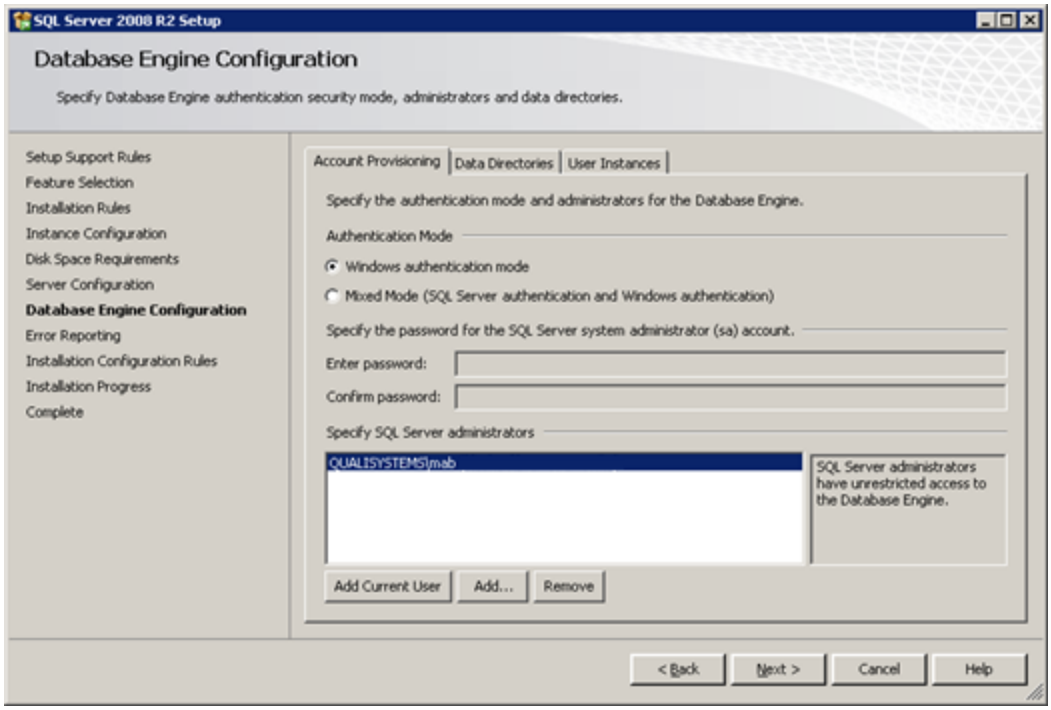
6. Click **Next**.
7. When installing the SQL Express database that is provided together with CloudShell, verify that localhost\qualisystems2008 is displayed in the Server Name list box.



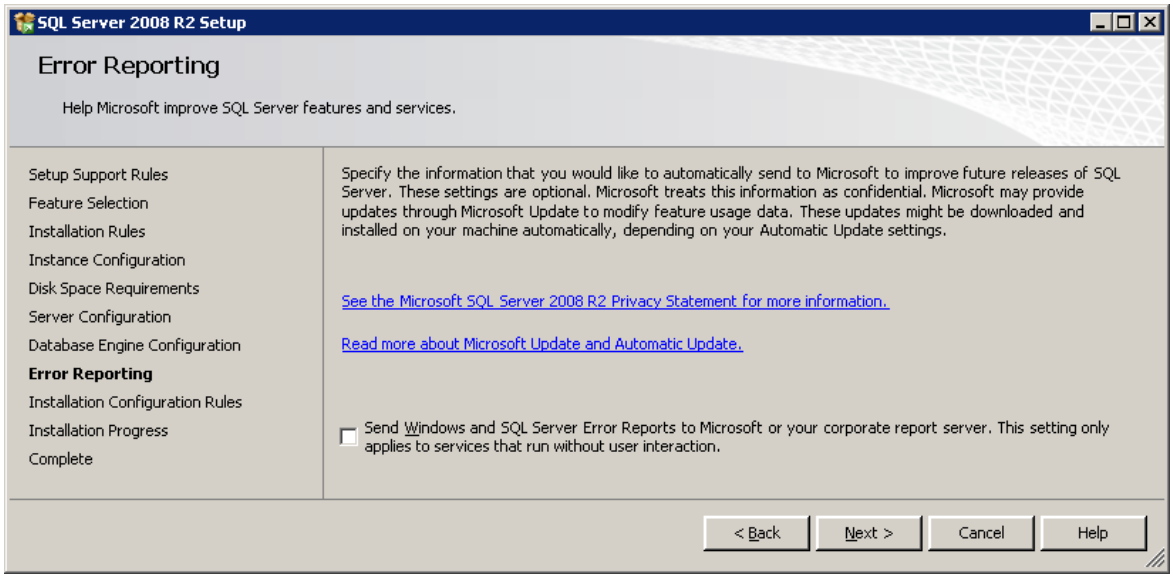
8. Click **Next**.



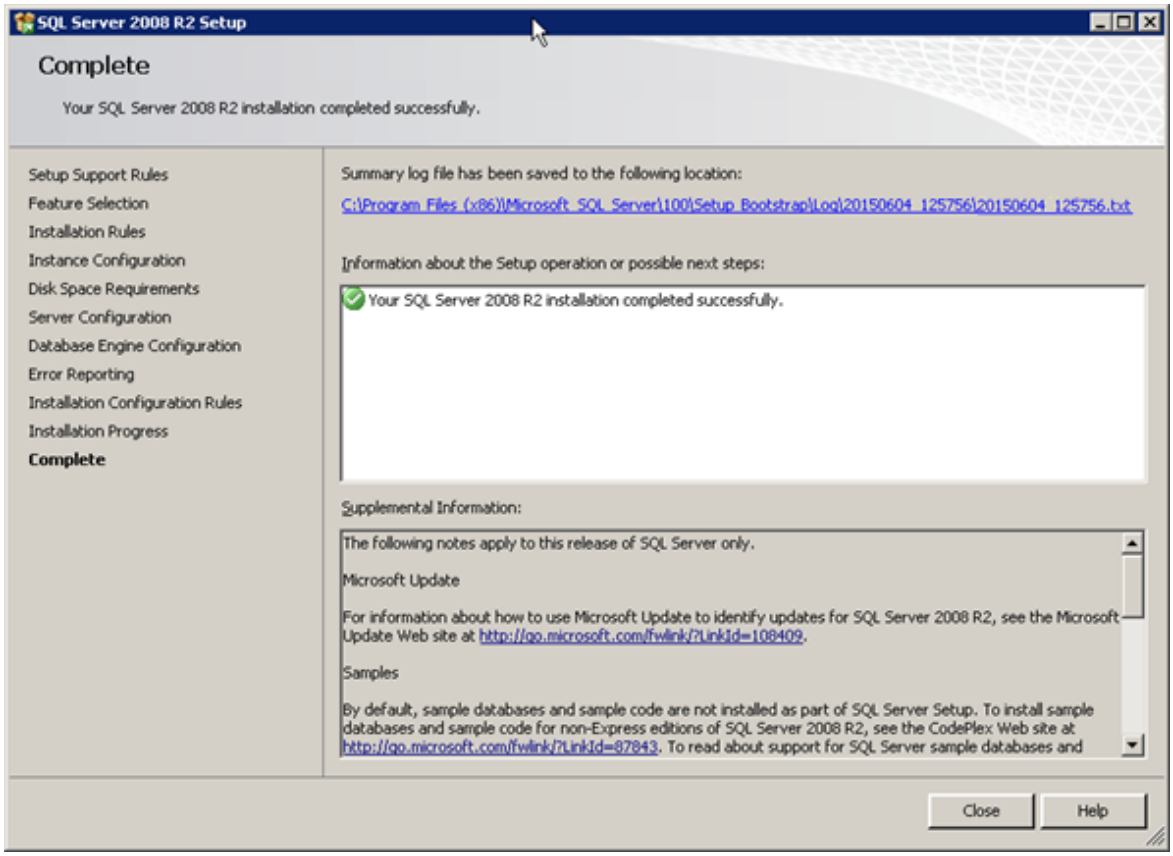
9. Click **Next**.



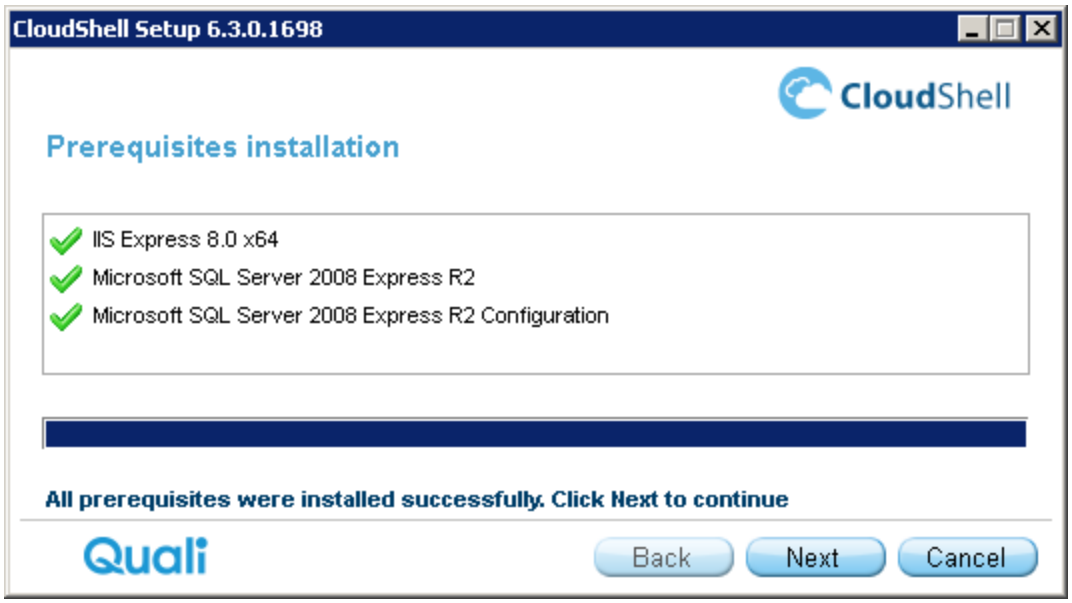
10. Click **Add Current User** and specify the required details.
11. Click **Next**.



12. Click **Next**. The SQL database installation proceeds.



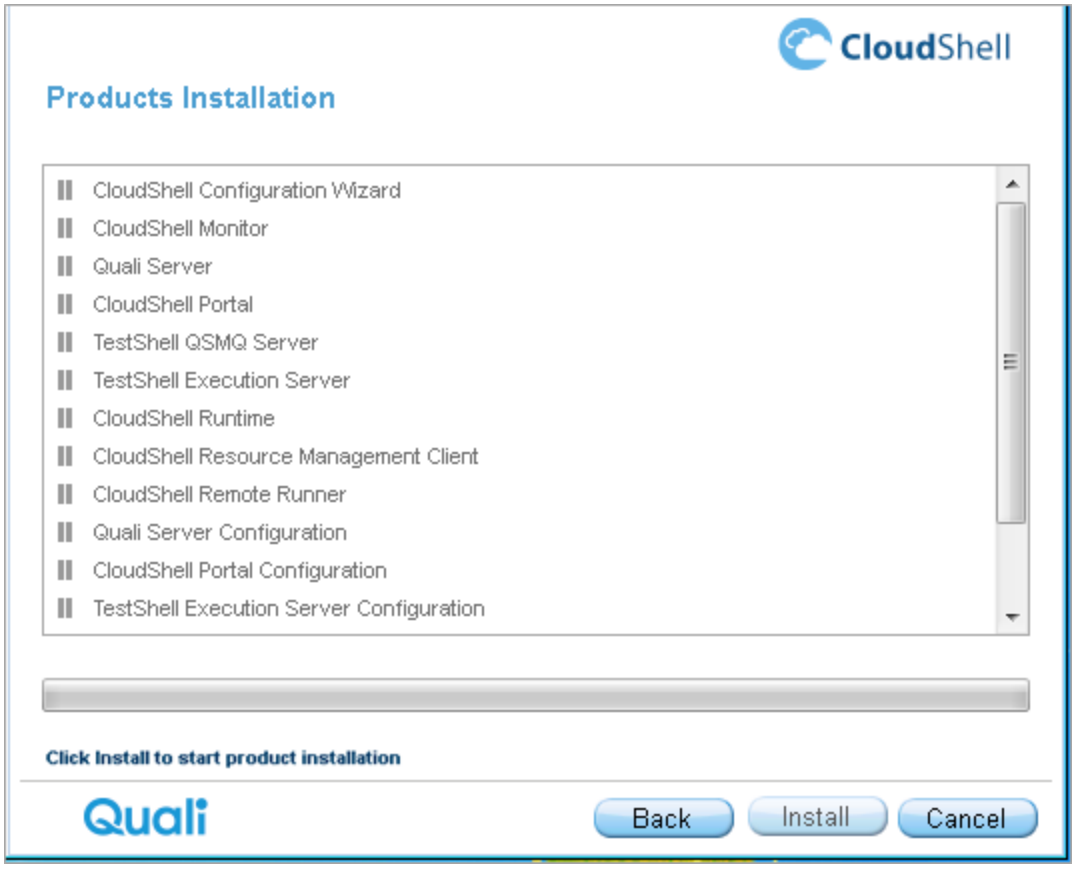
13. Click **Close**.

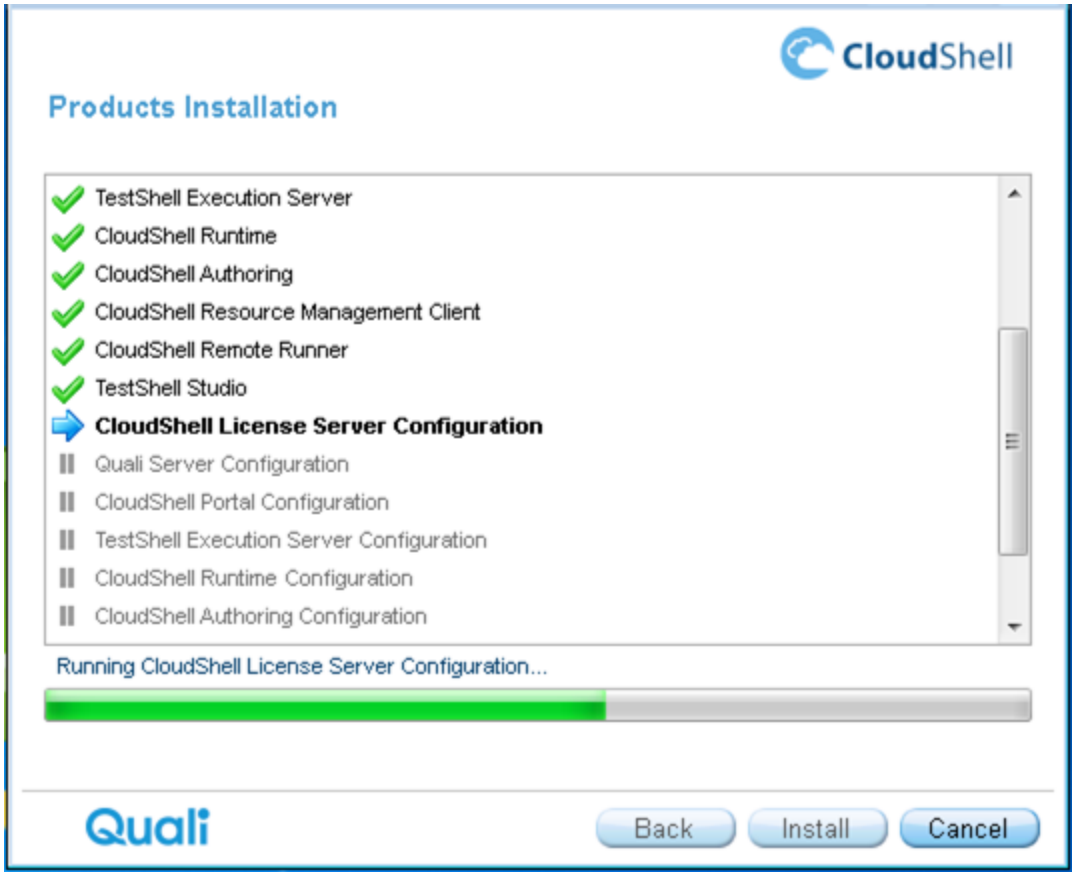


14. The prerequisites are installed.
15. Click **Next** and proceed to Install Products.

Install Products

1. In the **Products Installation** window, click **Install** to start the CloudShell product installation. Some supporting applications may be included in the list of applications to be installed.



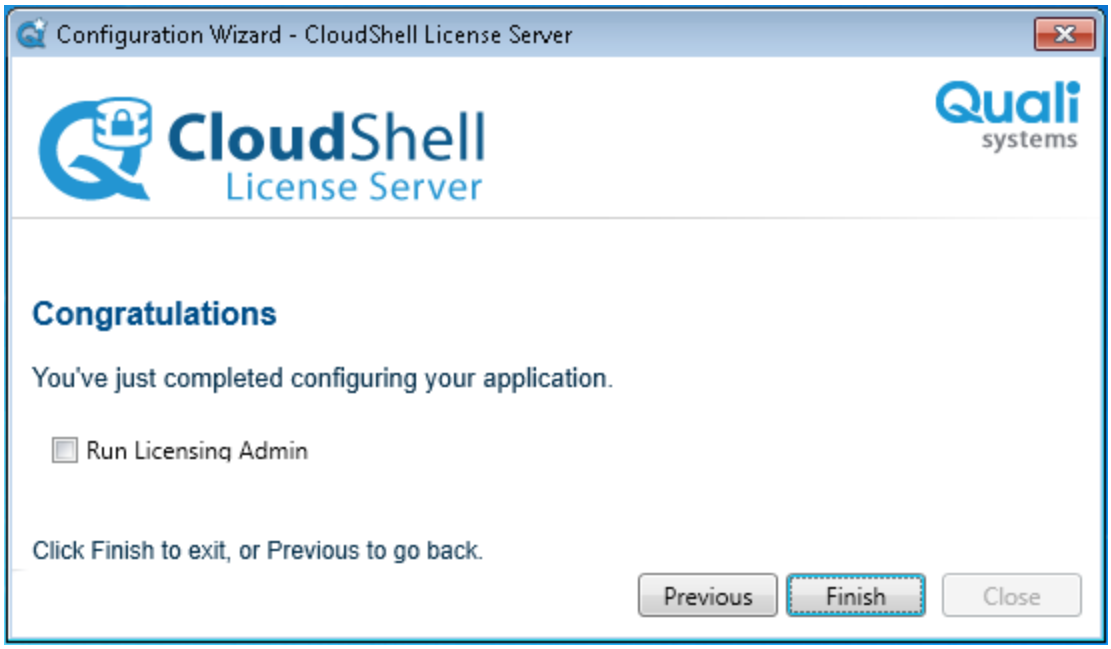


After completing the installation of the CloudShell License Server component, the installation wizard pauses.

A separate configuration window opens, relevant to the CloudShell License Server that has just been installed.

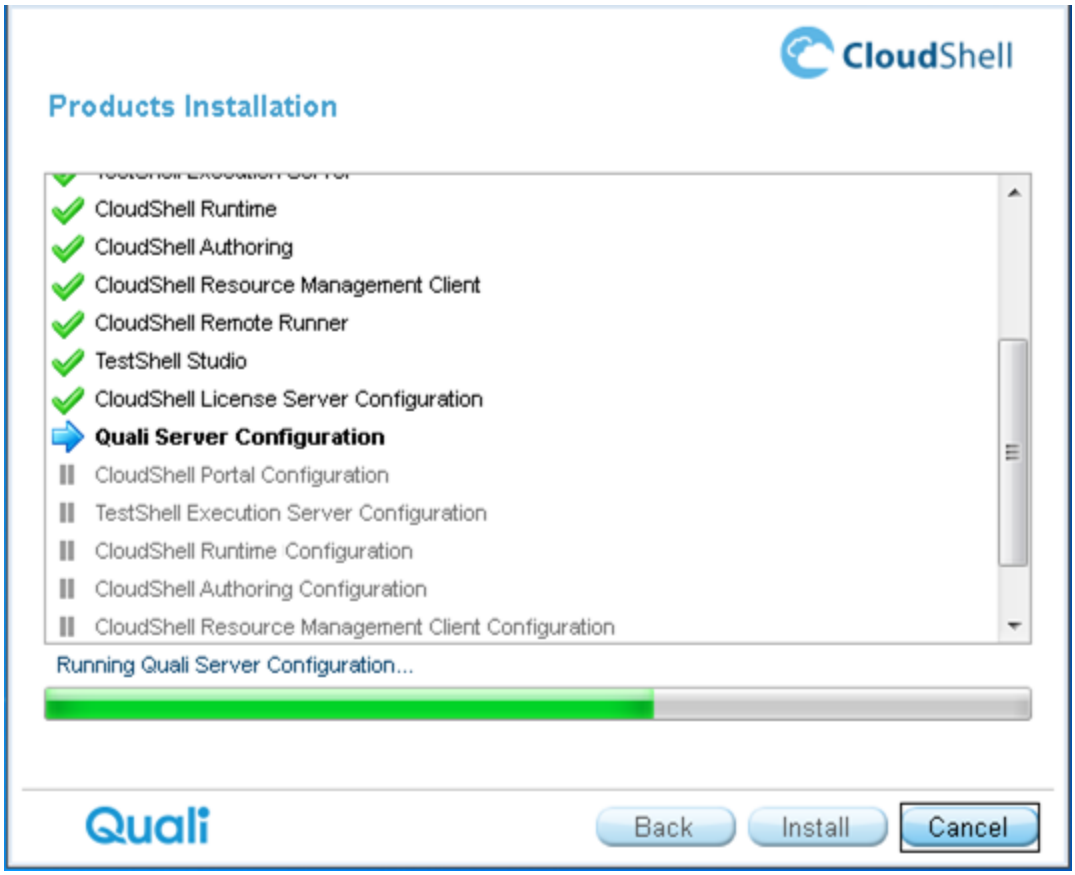
2. Complete the configuration steps and then continue with the installation wizard.

3. Complete the configuration settings for each installed application to achieve a successful installation.
4. Complete each step of the CloudShell License Server Configuration Wizard. For more information about configuring CloudShell, see Configure CloudShell Products.

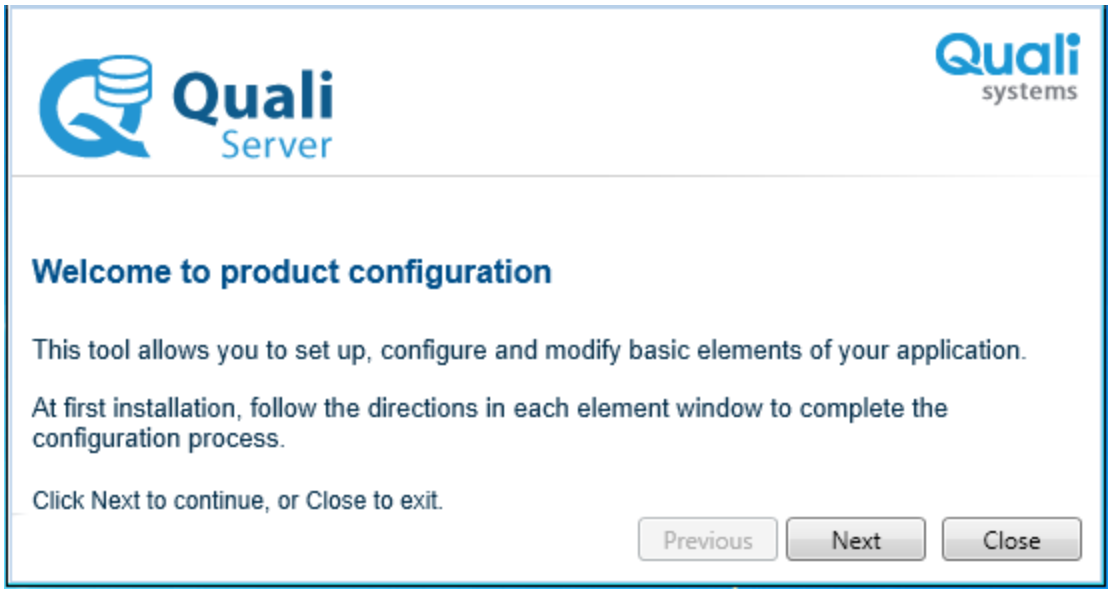


5. At the final step of the CloudShell License Server Configuration Wizard, click **Finish**.

The installation wizard continues with the installation procedure and installs the next component.

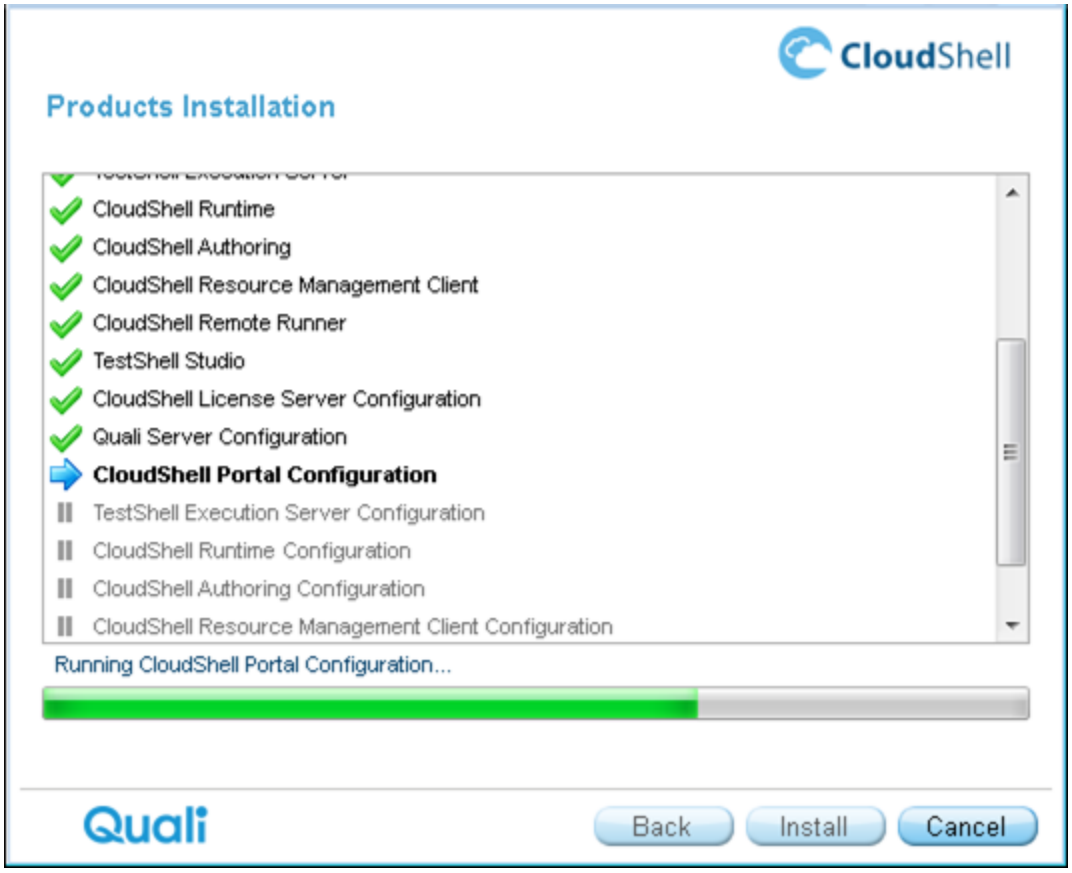


6. After completing the installation of the Quali Server component, the installation wizard pauses and the Quali Server Configuration Wizard opens.



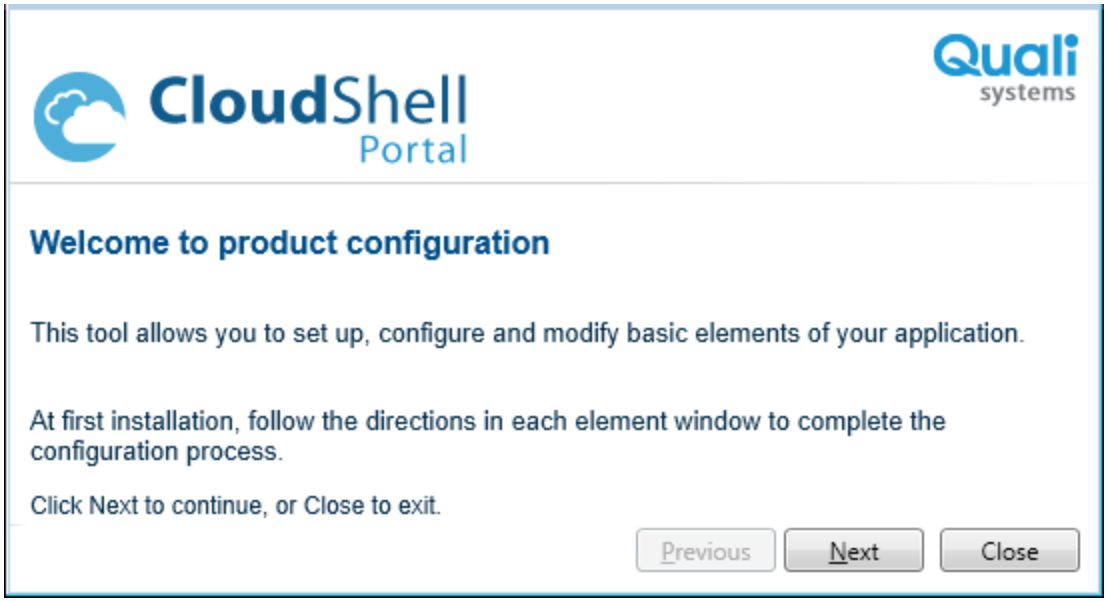
7. Complete each step of the Quali Server Configuration Wizard.
8. At the final step of the Configuration Wizard, click **Finish**.

   The installation wizard continues with the installation procedure and installs the next component.



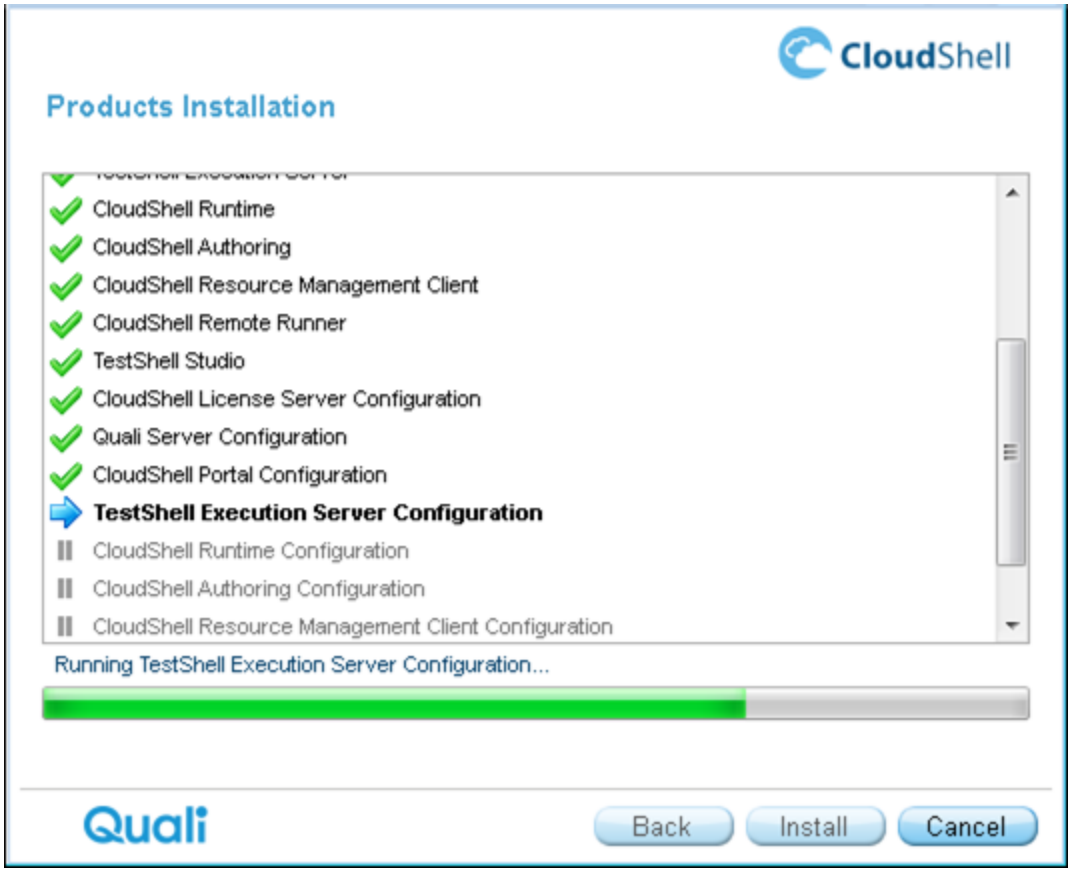
9. After completing the installation of the CloudShell Portal component, the installation wizard pauses.

   The CloudShell Portal Configuration Wizard opens.



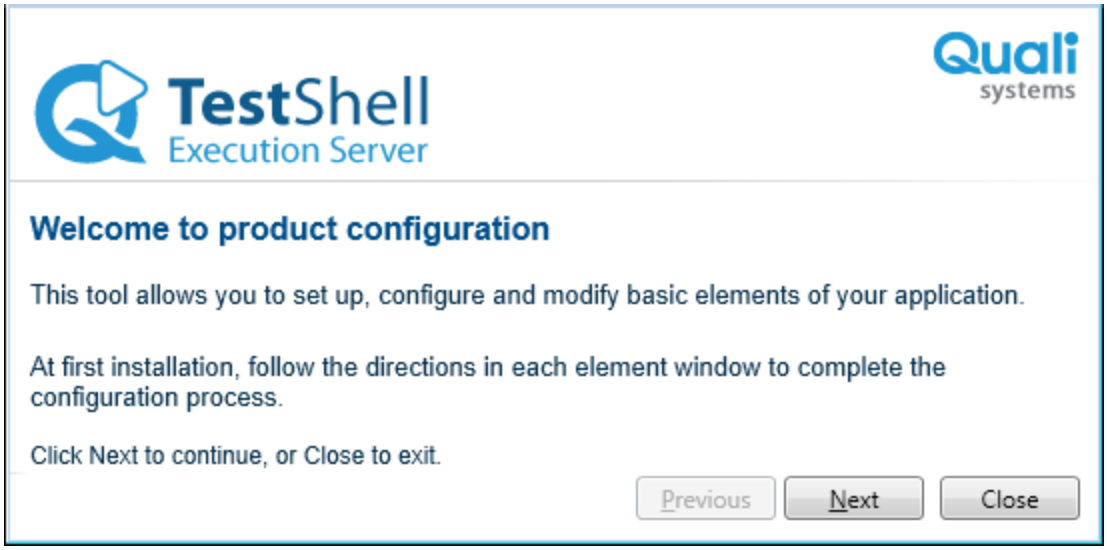
10. Complete each step of the CloudShell Portal Configuration Wizard.
11. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.



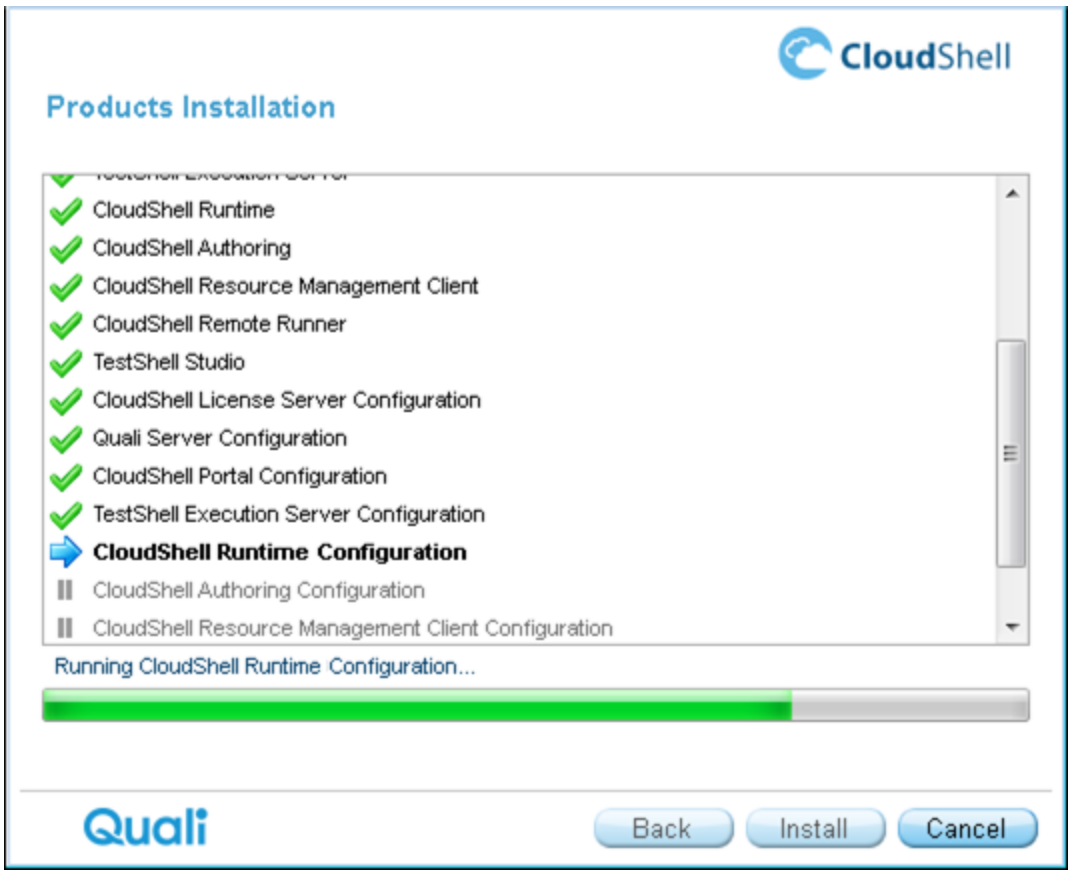
Note: Before installing the Execution Server, make sure VCTools++ is installed for all users so that the Execution Server can use it to compile Python dependencies, when needed. Alternatively, uninstall VCTools++ to have CloudShell install it for you.

12. After completing the installation of the TestShell Execution Server component, the installation wizard pauses. The TestShell Execution Server Configuration Wizard opens.

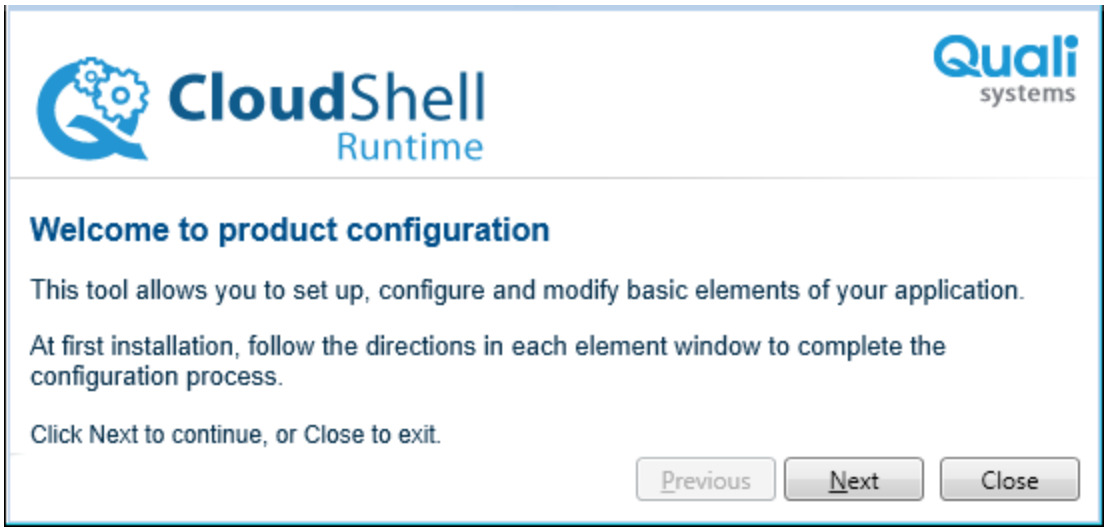


13. Complete each step of the TestShell Execution Server Configuration Wizard.
14. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.

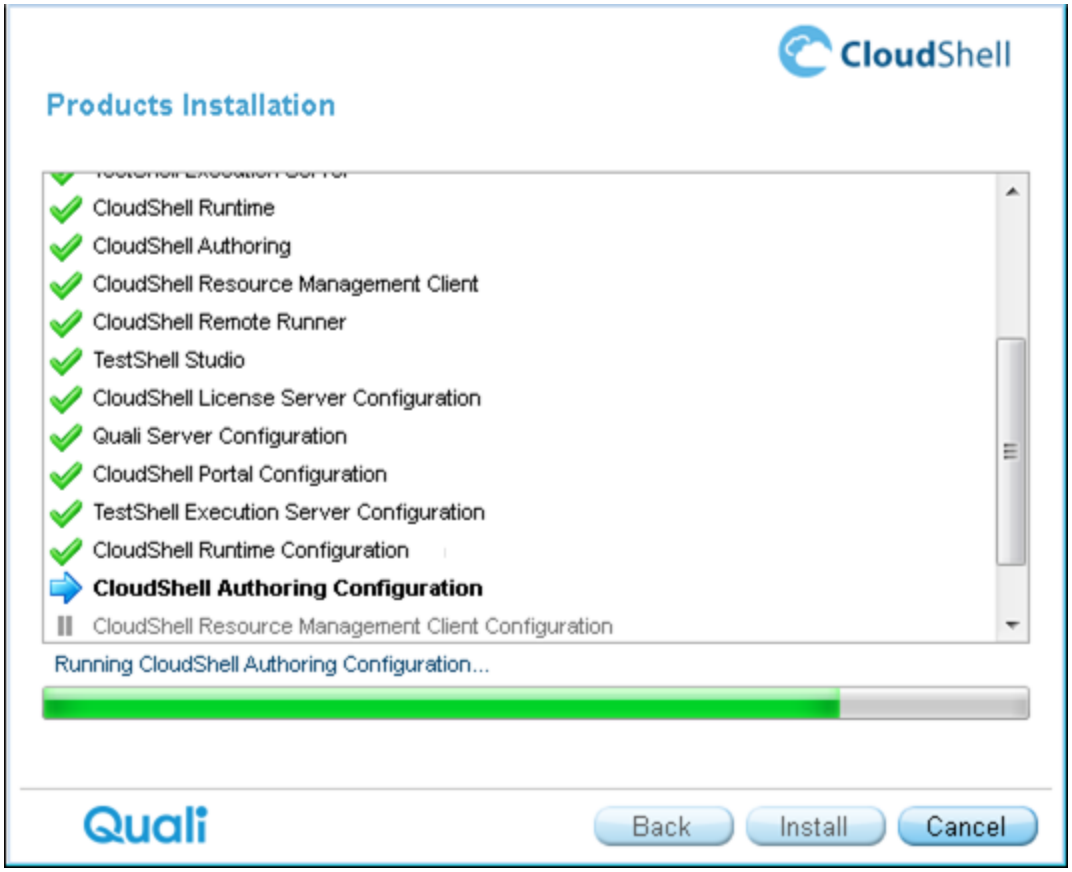


After completing the installation of the CloudShell Runtime component, the installation wizard pauses.

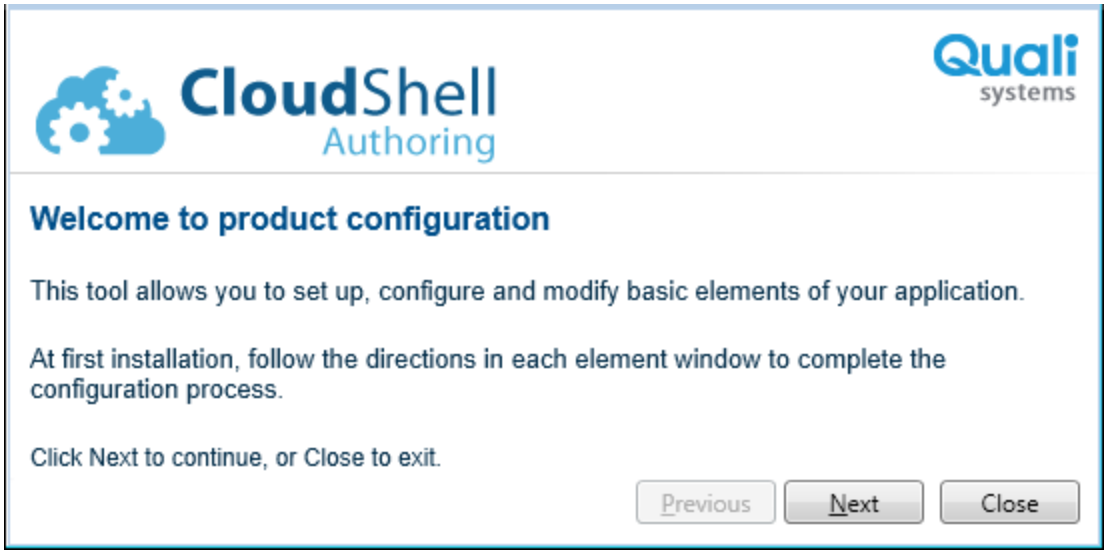


15. Complete each step of the CloudShell Runtime Configuration Wizard.
16. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.

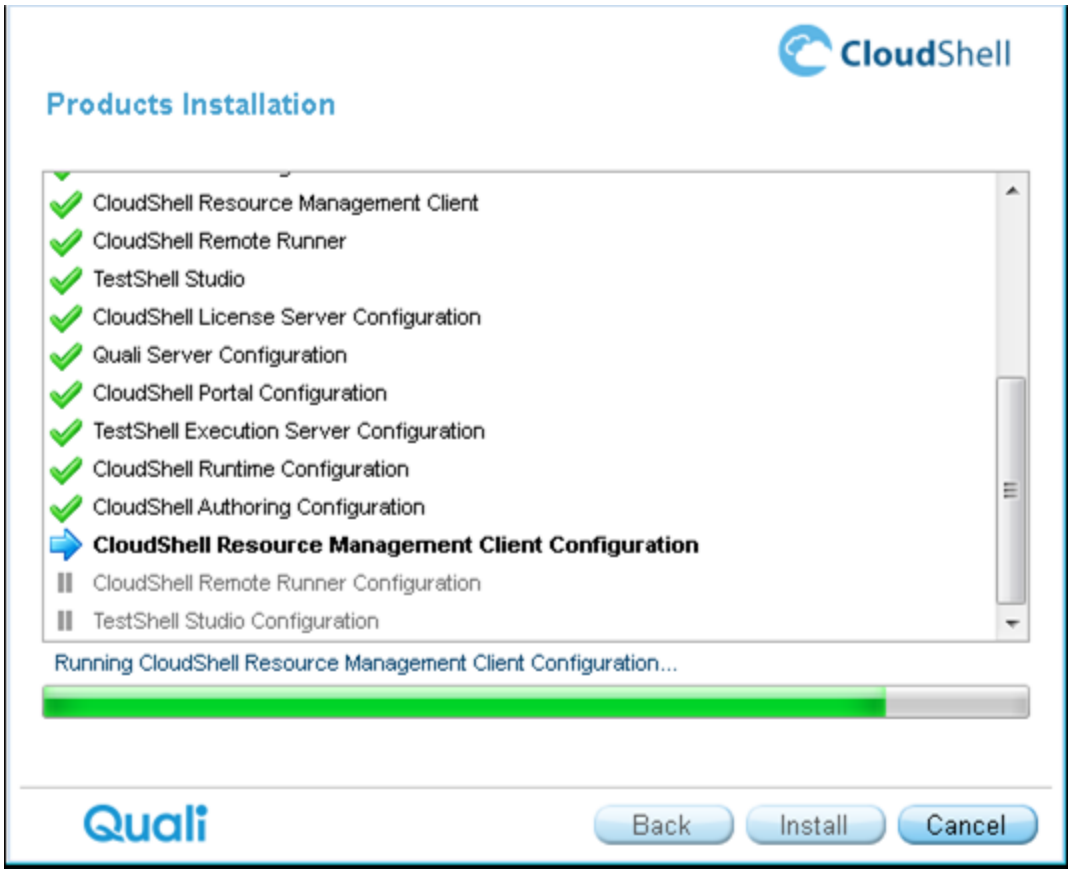


After completing the installation of the CloudShell Authoring component, the installation wizard pauses. The CloudShell Authoring Configuration Wizard opens.



17. Complete each step of the CloudShell Authoring Configuration Wizard.
18. At the final step of the component Configuration Wizard, click **Finish**.

The installation wizard continues with the installation procedure and installs the next component.

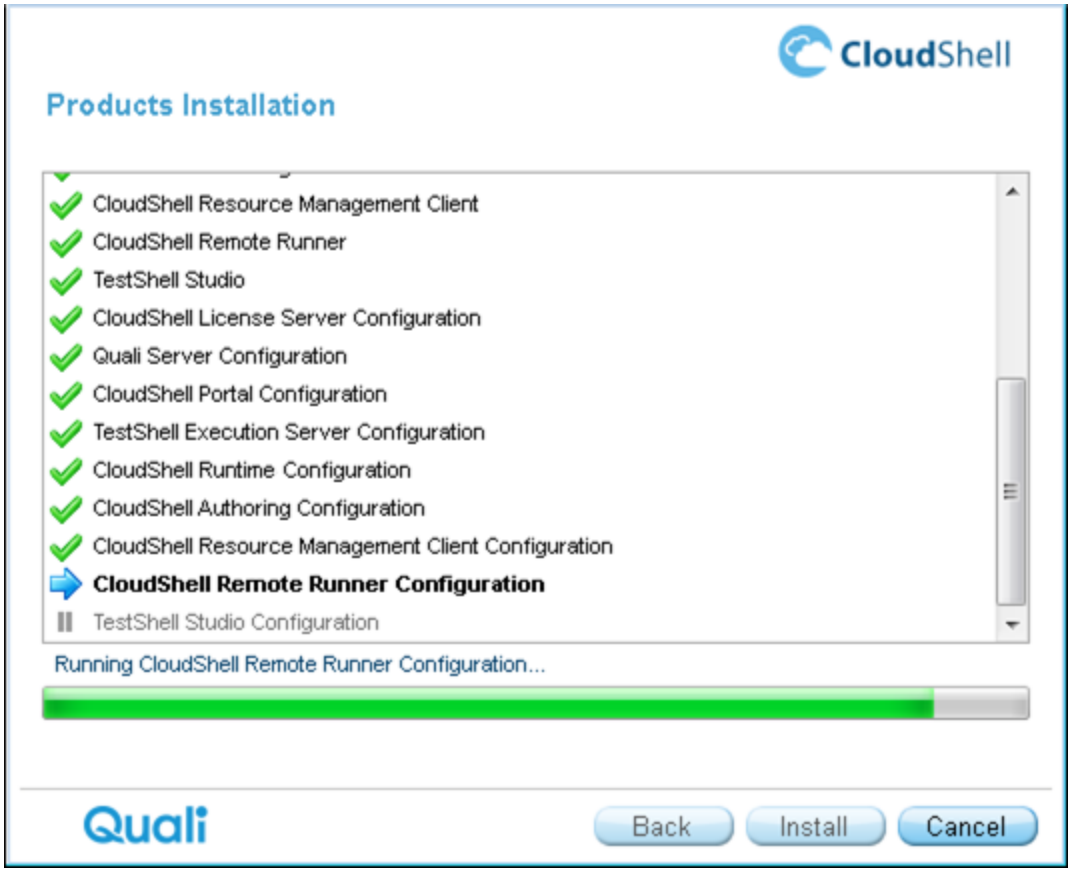


19. After completing the installation of the CloudShell Resource Management Client component, the installation wizard pauses.

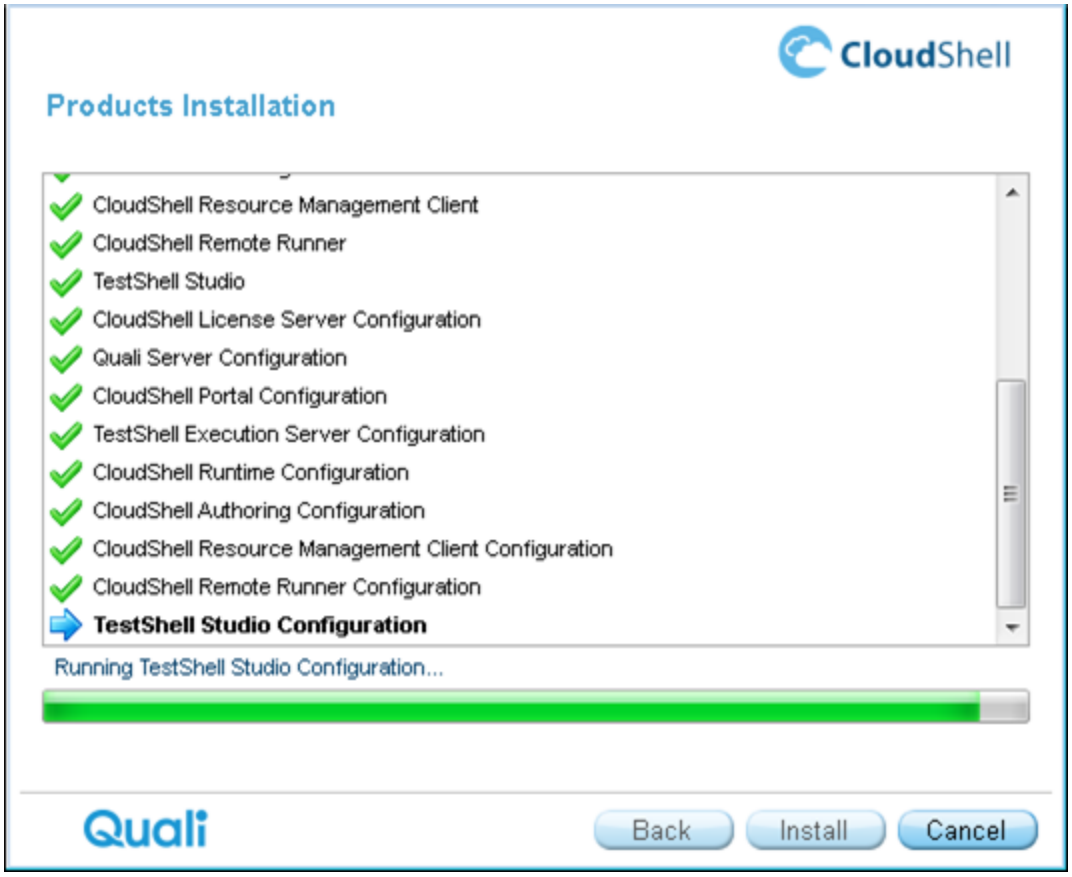
    The CloudShell Resource Management Client Configuration Wizard opens.

20. Complete each step of the CloudShell Resource Management Client Configuration Wizard.
21. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.

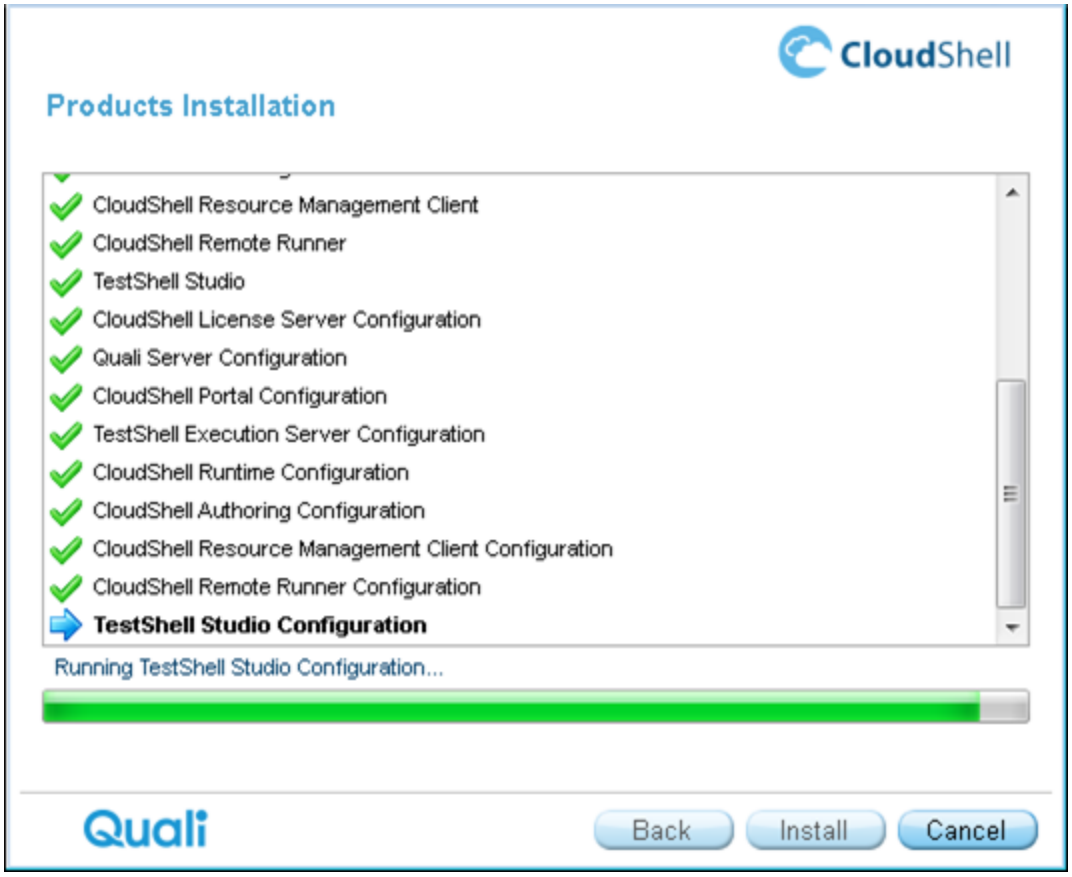


After completing the installation of the CloudShell Remote Runner component, the installation wizard pauses. The CloudShell Remote Runner Configuration Wizard opens.



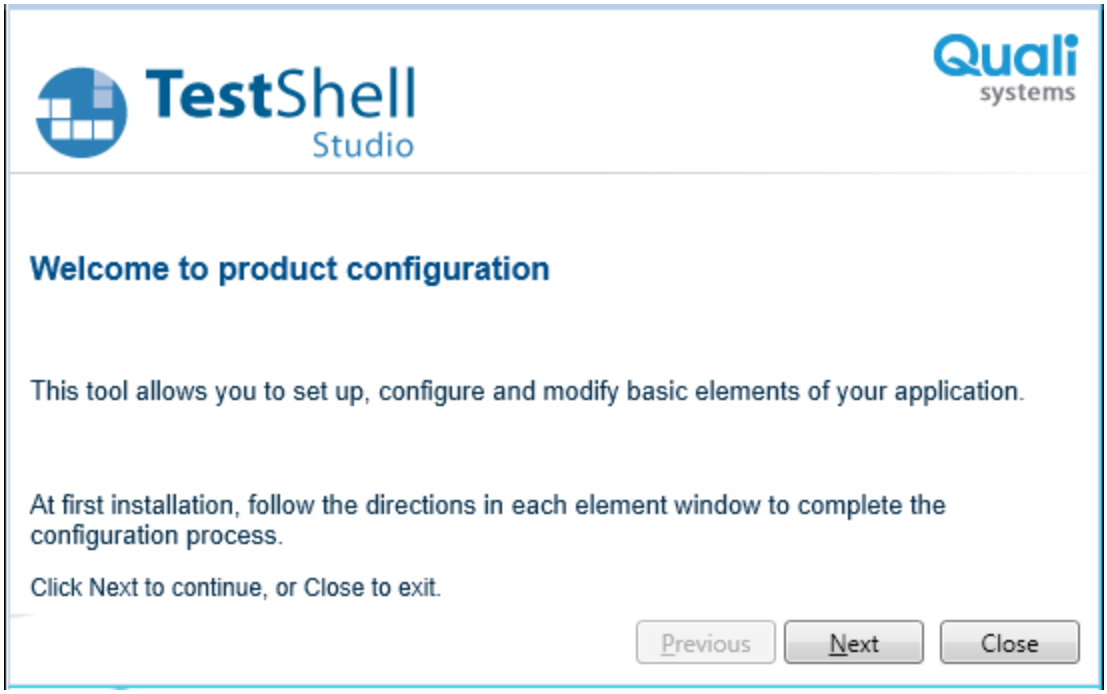
22. Complete each step of the CloudShell Remote Runner Configuration Wizard.
23. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.



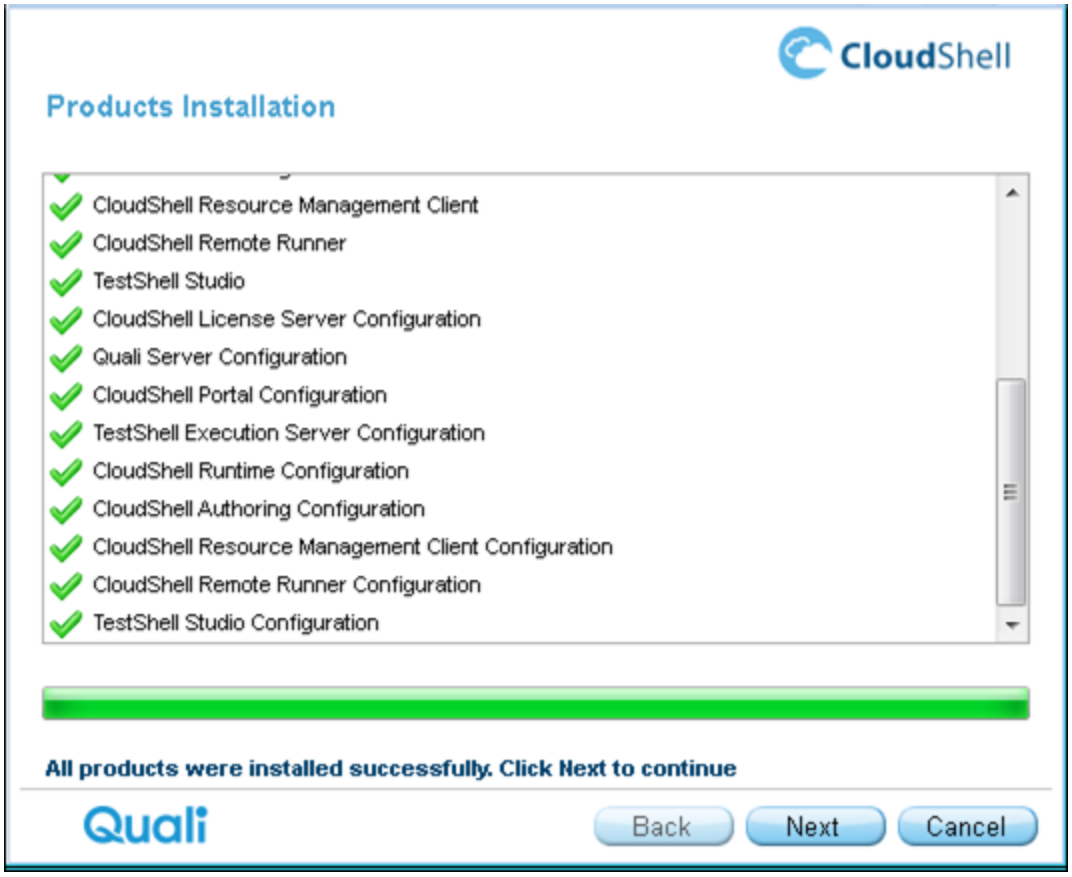
After completing the installation of the TestShell Studio component, the installation wizard pauses.

The TestShell Studio Configuration Wizard opens.

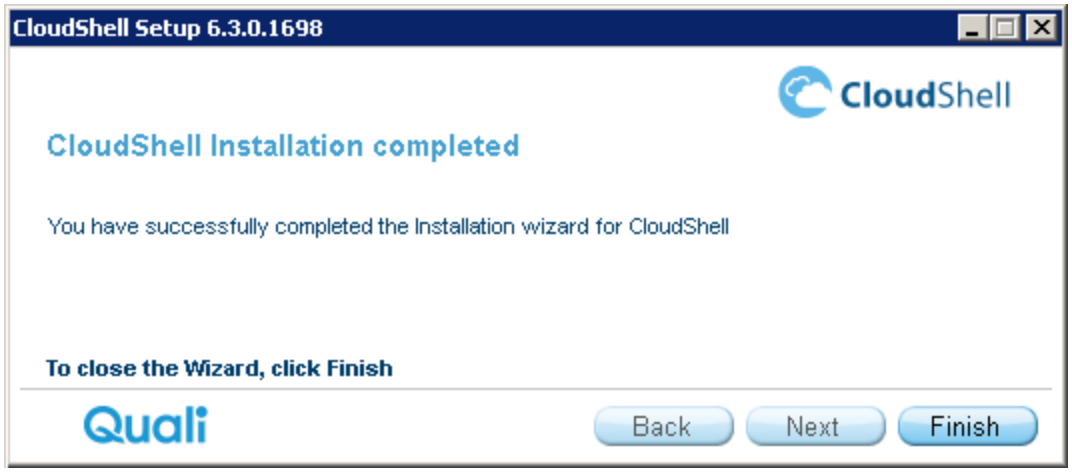


24. Complete each step of the TestShell Studio Configuration Wizard.
25. At the final step of the component Configuration Wizard, click **Finish**.

    The installation wizard continues with the installation procedure and installs the next component.

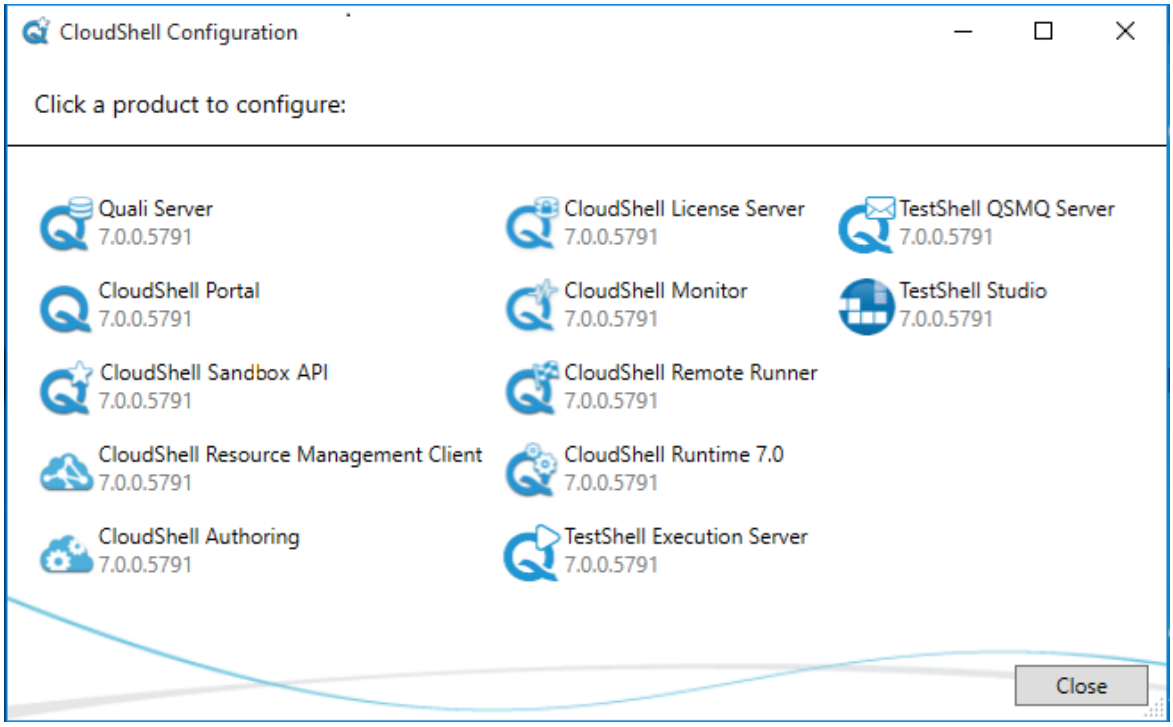


26. Click **Next** to complete the installation procedure.



27. Click **Finish**.

    You can run the CloudShell Configuration Wizard for any installed CloudShell application, as required.



For more information about the CloudShell Configuration Wizard procedure, see Configure CloudShell Products.

Proceed to Import User Definitions from an Active Directory (Optional) .

Import User Definitions from an Active Directory (Optional)

This section describes how to import user definitions from an active directory. Perform these steps after completing the CloudShell installation.

Add a key to the customer.config file

Use the following steps to add the required key to the `customer.config` file and modify it to the required domain name.

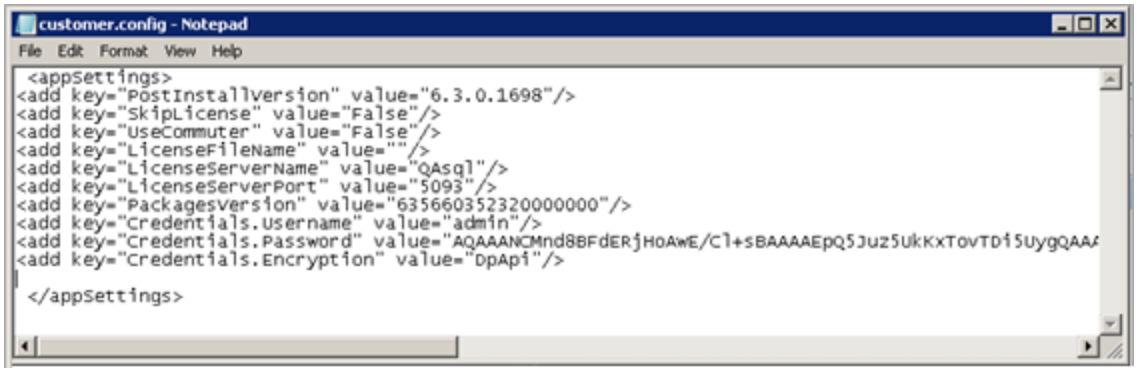
Note: Before importing user definitions from the active directory, ensure that the logon user of the server is in the same domain as the Active Directory.

To add the required key to the customer.config file and then modify the key:

1. In the machine where CloudShell is installed, navigate to CloudShell installation folder, for example:

   `C:\Program Files (x86)\QualiSystems\CloudShell\Server`

2. Open the `customer.config` file in a text editor.



3. Add the following line to the `customer.config` file.

   ```
   <add key="ActiveDirectory.Domain" value="QUALISYSTEMS"/>
   ```

4. Modify the new key by changing the value field from "QUALISYSTEMS" to that of your domain, for example:

   ```
   value="MYDOMAIN"
   ```

5. Save the modified `customer.config` file.
6. Restart the service.

Import new users into CloudShell

The definition of users is done through CloudShell Resource Management Client.

Note: Before importing user definitions from the active directory, the logon user of the server must be in the same domain as the Active Directory.

To import new users into CloudShell:

1. Open the CloudShell Resource Management Client.
2. From the **Help** menu, select **CloudShell knowledge base > Admin guide > User management > CloudShell users and groups**.
3. Follow the steps described in the "Importing new users into CloudShell" topic in the Admin Guide.

Configure CloudShell Products

This section describes the configuration settings for the CloudShell products.

Configure Application Settings

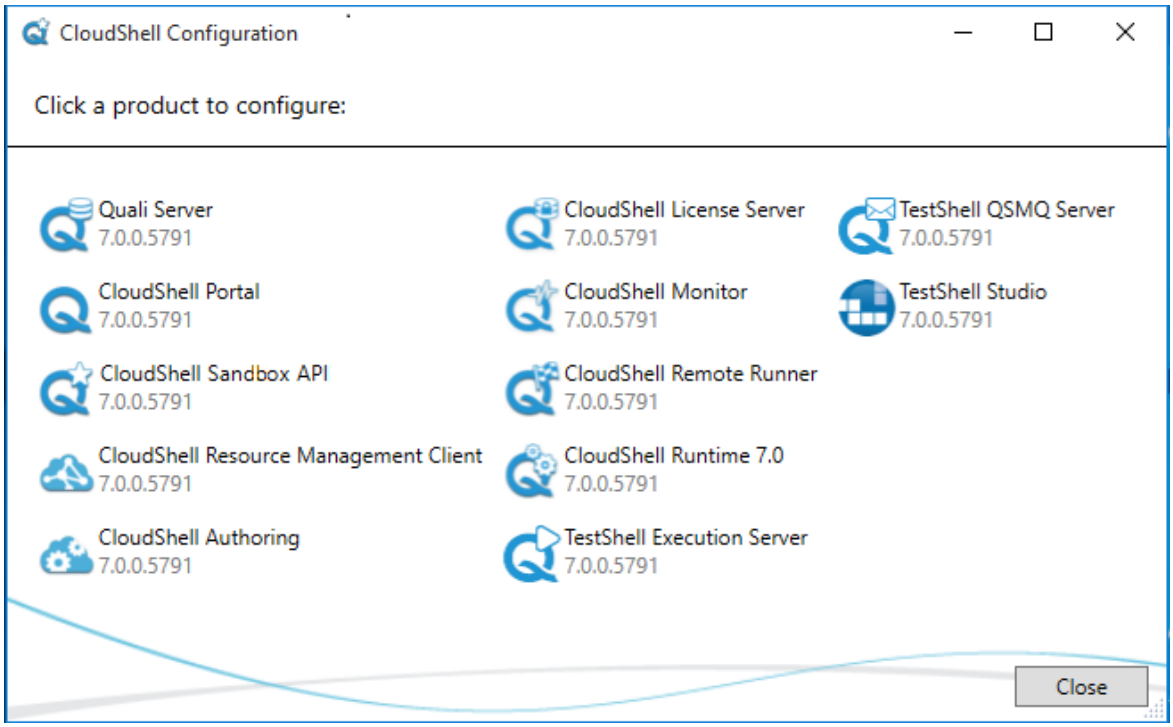
While the available configuration settings vary for each component, the configuration options are the same within each configuration utility. For example, for any product where you need to select a license, the **Select a license** screen works the same way for every configuration utility. Instead of walking through each in a linear fashion and repeating the information multiple times, the process of selecting a license is explained once, see Select a CloudShell License.

You need to complete or close the configuration settings for each installed application for a successful installation.

If you choose to close, rather than complete a product installation, make sure to run the product's configuration utility prior to launching it for the first time.

To launch the CloudShell Configuration Wizard:

1. Select **Start > All Programs > QualiSystems > Tools > CloudShell Configuration Wizard**.

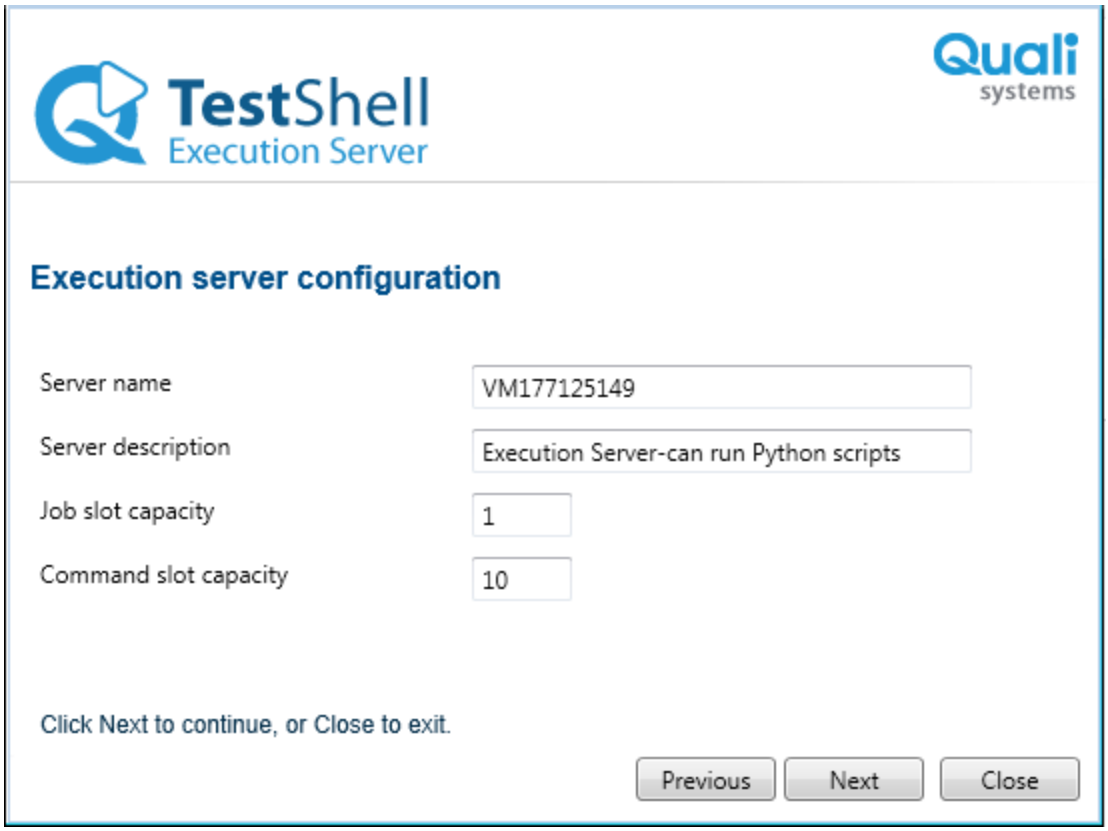


2. Select a product to configure and follow the prompts of the wizard. (Configuration details are provided in the following related topics.)

Configure the TestShell Execution Server

To configure the TestShell Execution Server:

1. In the **TestShell Execution Server configuration** window, specify the execution server settings:



Parameter	Description
Server name	Specify a name for the server. By default, the computer name is used as the execution server name.
Server description	Enter a short description of the server. This description helps portal users when selecting which execution server to use in a job template.
Job slot capacity	Specify the permitted number of concurrent jobs.

Parameter	Description
Command slot Capacity	Specify the permitted number of commands. You can specify 0 or any required number of command slots. The value of this field is not dependent on a license. Note: Do not leave this field blank. Specify either 0 or the required number of command slots.

2. Click **Next**.

Configure the TestShell Execution Server to Run as a Process by Default

By default, the TestShell Execution Server currently runs as a service, which may be convenient in many cases. However, there are some technical limitations when running the Execution Server as a service, for example, the following features cannot be used:

- GUI automation (Ranorex)
- Writing to Excel through the Filesystem library prior to Library version 5.1.1
  Libraries which must launch a GUI, for example: IxNetwork
- Studio Function - Capture Image

In contrast, there may be instances that it is preferred to run the Execution Server as a process. However, the limitation in this case is that the user has to be logged in to Windows, which may not always be possible, or simply inconvenient.

The following procedure explains the steps required to convert the default TestShell Execution Server service to a process.

To run the TestShell Execution Server as a process by default:

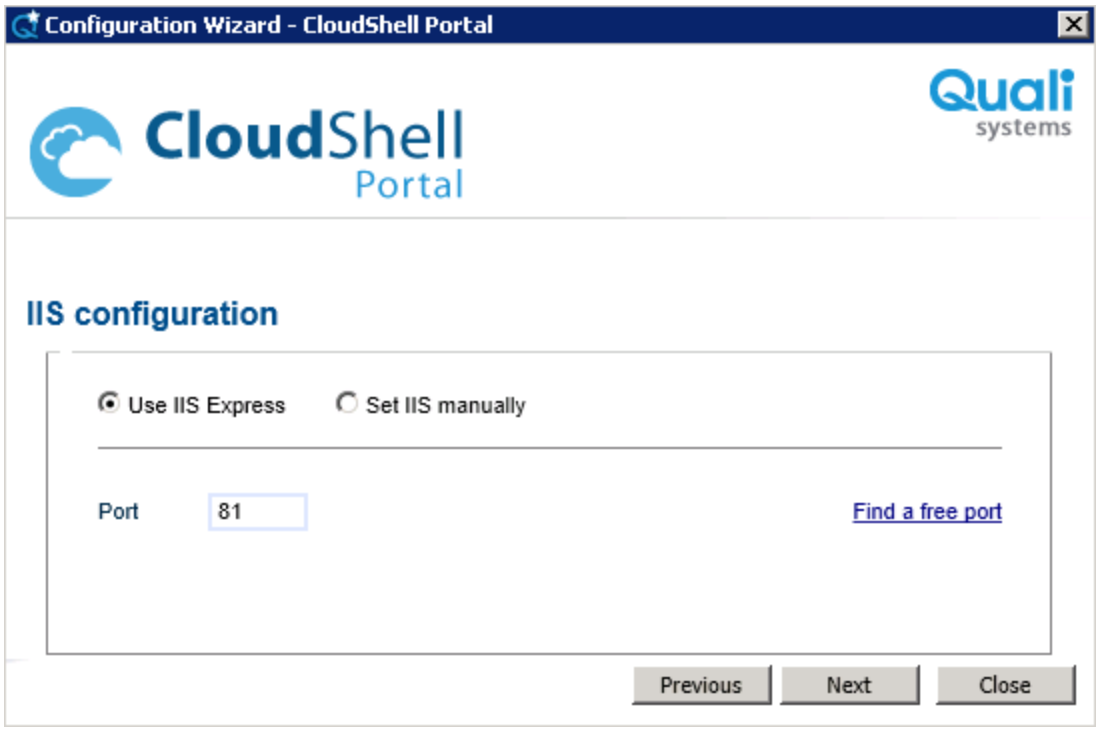
1. Stop the Execution Server service.
2. Run CMD (as administrator).
3. Delete the service (`sc delete [ServiceName]`).
4. Create the CMD script with following command:
   `c:\Program Files (x86)\QualiSystems\TestShell\ExecutionServer\QsExecutionServer.exe tray`
5. Add the CMD script to the "startup" folder. (Windows launches the script automatically.)

Configure the Self-Service Portal

CloudShell Portal is a self-service web client. This section describes how to configure the CloudShell Portal.

Install the required IIS version

- Use the `IIS configuration` window to install the required IIS version.



The portal is installed in the QualiSystems Program Files folder:

- For 32 bit OS: `C:\Program Files\Qualisystems\CloudShell\Portal`
- For 64 bit OS: `C:\Program Files (x86)\Qualisystems\CloudShell\Portal`

Configure the session timeout interval

1. Go to the `<Installation drive>\Program Files (x86)\QualiSystems\CloudShell\Portal\Web.config` file.
2. Set the CloudShell Portal timeout interval using the “timeout” attribute in the “sessionState” element.

   The value that is specified for the “timeout” attribute determines the CloudShell Portal session timeout interval in minutes.

In the `Web.config` file, the following XML lines contain the "timeout" attribute:

```
<system.web>
    <sessionState timeout="120">
    </sessionState>
```

This default setting means that the CloudShell Portal timeout interval is set for 120 minutes.

An alert message is issued shortly before the timeout, so if you do modify the timeout interval, do not use a setting that is six minutes or less.

3. After modifying the `Web.config` file, save it, restart the IIS, and clear the browser cache.

Note: Any modification that you make to the `Web.config` file is overwritten during an upgrade of the CloudShell application.

IIS configuration with IIS Express

When the **Set IIS Express** option is selected, setup installs IIS Express if it does not already exist on the server machine:

- On Windows 7 and Windows Server 2008, IIS Express version 8.0 is installed, either 32-bit or 64-bit, according to the OS platform.
- Earlier versions of IIS Express are uninstalled from your machine.

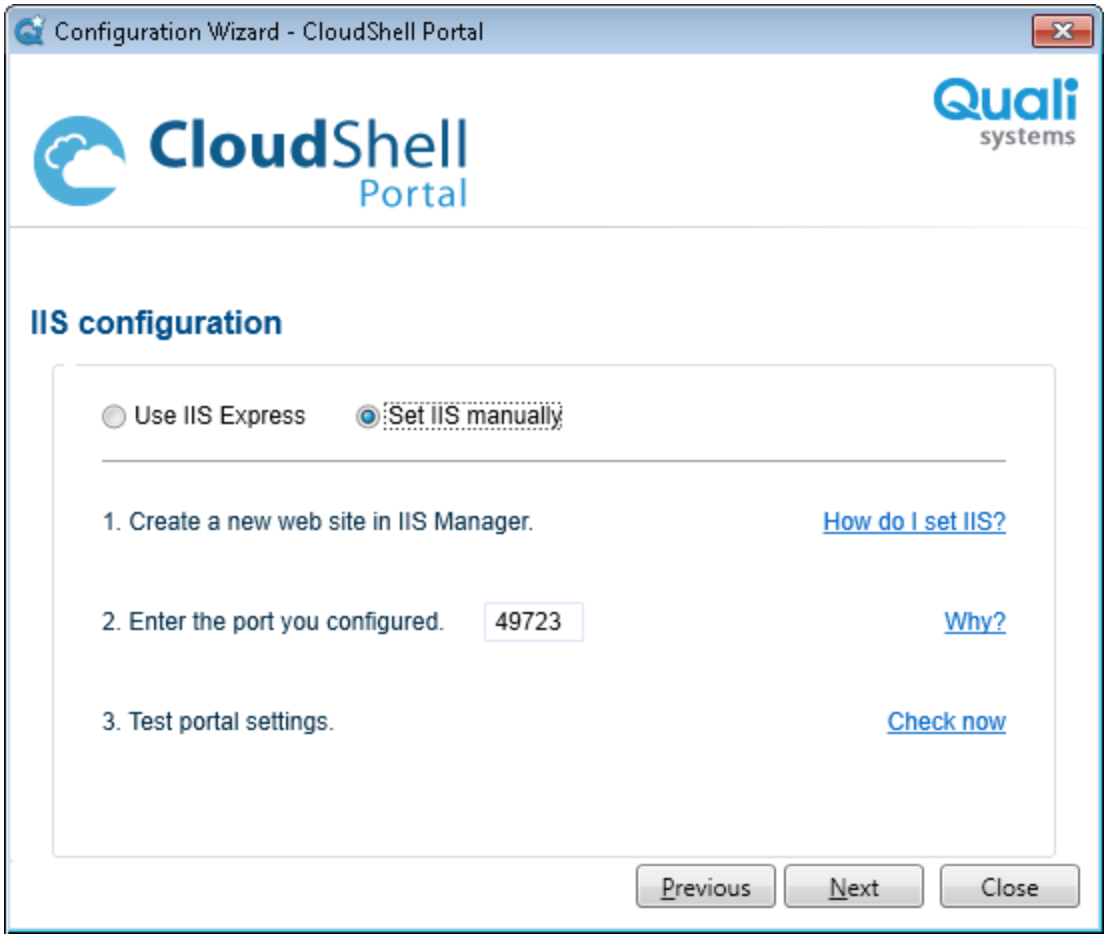
The default configuration uses port 80 as the port number and localhost as the address. You can configure these settings during the installation, or modify them later by launching the Quali Server configuration utility.

To load the portal:

1. Open a browser and enter the `localhost:Port# address` for a local machine, or the `IP:port/DNS:port address` for remote access.
2. In the **Administrative Tasks** window (see Admin Configuration Settings), set the admin password, email, and SMTP settings, assign users to groups and domains, and update data.
3. Optionally, designate the port manually by entering an available port number in the `Port` field text box. The installer notifies you if the port that you specified is unavailable.

IIS configuration using the IIS manual option

1. When the **Set IIS manually** option is selected, the IIS configuration window is displayed:



2. Proceed with the configurations described in the following topics:
   a. Create a new website in IIS Manager.
   b. Enter the port you configured.
   c. Test portal settings.

Create a new website in IIS Manager

This procedure assumes that CloudShell Portal and Quali Server are installed on the same machine.

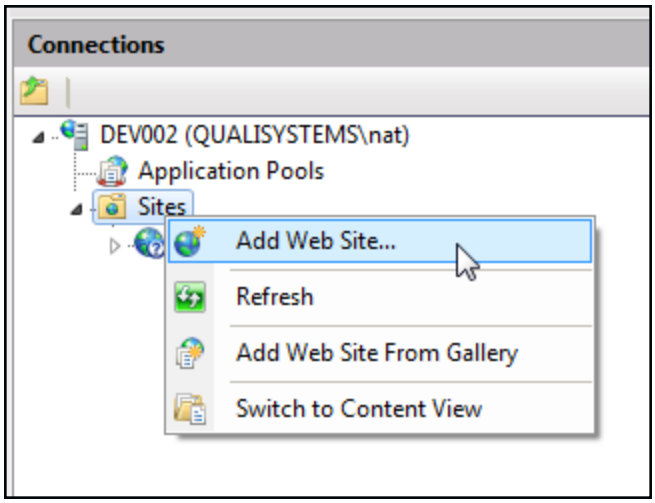
Note: Complete the CloudShell Portal and Quali Server installation procedure and then return to this procedure.

To create a new website in IIS Manager:

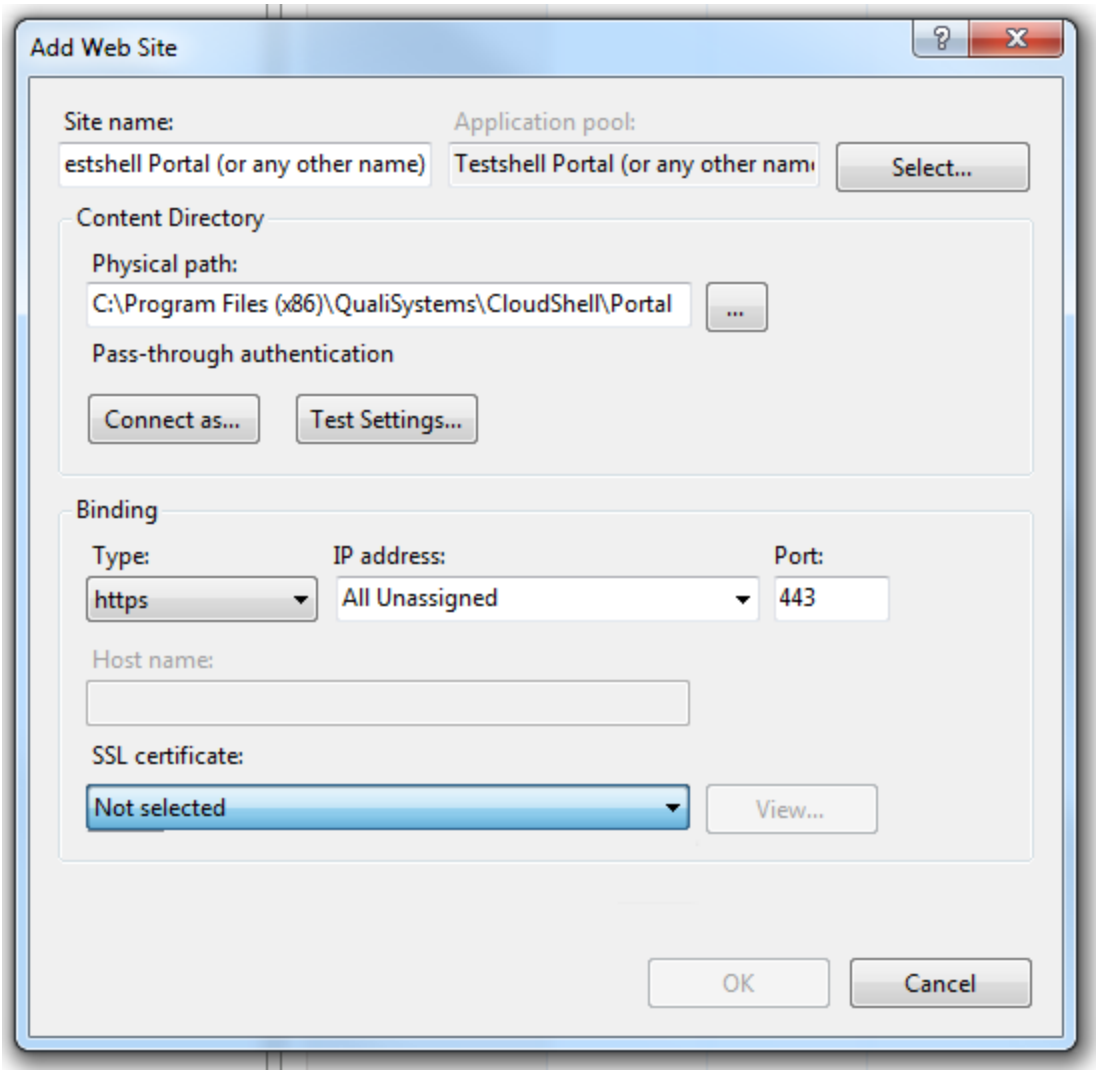
1. After completing the installation procedure to install CloudShell Portal and Quali Server, open the IIS Manager by running the following command at the command prompt:

```
inetmgr.msc
```

2. In the **Connections** window, right-click **Sites**.

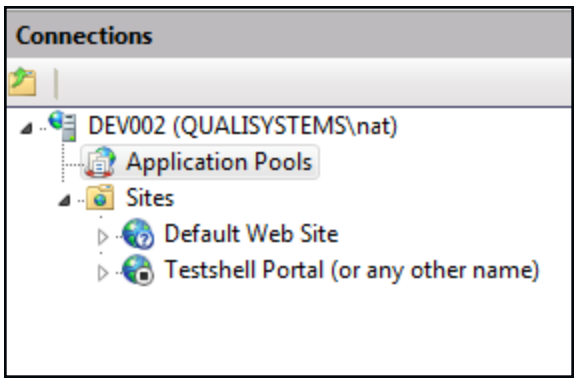


3. In the context menu, select **Add Web Site**.

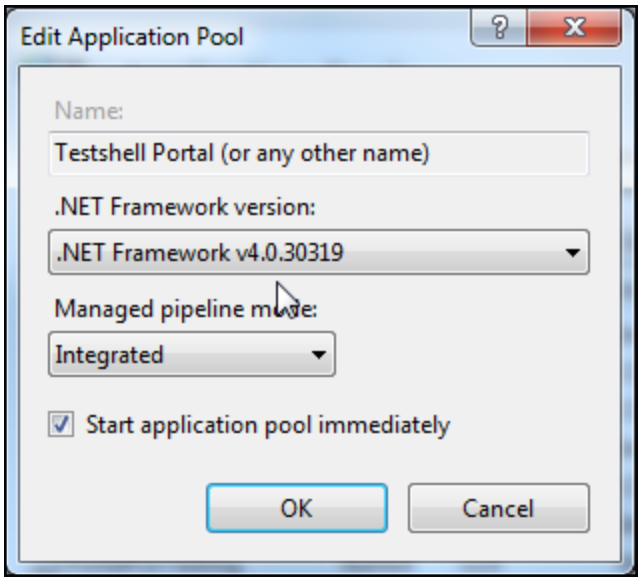


4. In the **Site name** field, specify a name for the site.
5. In the **Content Directory** field, specify a **Physical Path**, pointing to the portal folder.
6. (For HTTPS only) Set the **Binding Type** to **https**.
7. (For HTTPS only) Set the **SSL certificate** to the certificate provided by the client.

8. Click **OK** to submit the changes.



9. In the **Connections** window, right-click **Application Pools**.



10. In the **Edit Application Pool** window, edit the application pool that was created for your web-site. Modify the **.NET Framework version** to **4.0 [5.1 Patch 4]**.
11. Go to the `$\Qualisystems\Cloudshell\Server\QsTeamServer.exe.config` file and change the value for `LoadIISExpress` to `False` in the following key:

    ```
    <add key="Portal.LoadIISExpress" value="False" />
    ```
12. Go to the `$\Qualisystems\Cloudshell\Portal\customer.config` file and change the value for `UseIisExpress` to `False` in the following key:

    ```
    <add key="UseIisExpress" value="False"/>
    ```
13. In IIS Manager, start the website.
14. Restart the Quali Server.
15. Browse to the website and test it.

Note: Skype and perhaps other applications might block certain ports. For example, Skype blocks the default HTTPS port 443.

16. If error message HTTP Error 500.19 is issued, open the command prompt as administrator and run the following command:

    ```
    cd C:\Windows\Microsoft.NET\Framework\v4.0.30319\
    aspnet_regiis -i
    ```

17. Reload the website.
18. If you are running Microsoft Server 2012 and error message "HTTP Error 500.19" is issued, go to `$\Qualisystems\Cloudshell\Server` and modify the `QsTeamServer.exe.config` file. .
19. If you are using IIS 8 with Windows Server 2012 or Windows Server 2012 R2, make sure to install the 'Web Server' role within the server manager.
20. After choosing the web server role, click **Next** and in the **Role Services** section, under **Application Development**, select **ASP.NET 4.5**.

    This sub-role enables IIS to use the ASP.NET 4.5 for running the CloudShell Portal.

21. Continue to specify the IIS settings. Proceed to Enter the port you configured.

Enter the port you configured

The CloudShell Configuration Wizard requires the port number to be able to test connectivity.

To specify the IIS website port:

- In the **IIS configuration** window, in the **Enter the port you configured** field, specify the port that you entered in the **Add Web Site** window.

Test portal settings

To test the portal settings:

1. In the **IIS configuration** window, click **Check Now**.
2. Click **Next**.

IIS configuration changes when browsing to CloudShell Portal

When using Windows Server to run CloudShell Portal using IIS version 7.0+ webserver, you must modify the `Web.config` files in order for CloudShell Portal to work properly.

To modify the Web.config file:

1. Go to the `<Installation Drive>\QualiSystems\CloudShell\Portal \Web.config` file and locate the following XML element:

   ```
   <configuration>
       <system.webServer>
           <modules>
   ```

2. Add the following element under it:

   ```
   <remove name="WebDAVModule" />
   ```

3. Locate the following XML Element:

   ```
   <configuration>
       <system.webServer>
           <handlers>
   ```

4. Add the following element under it:

   ```
   <remove name="WebDAV" />
   ```

5. Save the `Web.config` file.
6. Restart CloudShell Portal.

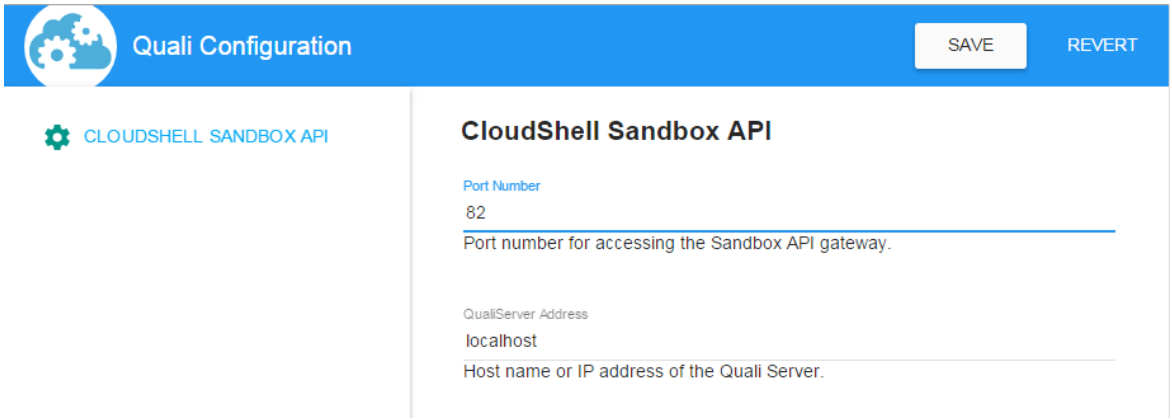
Configure CloudShell Sandbox API

The CloudShell Sandbox API service is installed by selecting the **CloudShell Sandbox API** option in the **Component selection** window (as described in Install CloudShell Sandbox API). The CloudShell Sandbox API can be installed either on the same machine as the CloudShell Portal/Quali Server or on a different machine, and you can install several instances of this service on several machines (and can configure the settings accordingly).

Note: The default port for the CloudShell Sandbox API in the Quali Server is 82. You can customize this port number, as required.

To customize the port settings for accessing the CloudShell Sandbox API:

1. In the CloudShell Configuration Wizard, click **CloudShell Sandbox API** to open a web page, where you can customize the **Port Number** for accessing the API to suit your needs.



2. When the CloudShell Sandbox API is installed on a different machine than the CloudShell Portal, in the **Quali Server Address** field, you can specify the host name or IP address of the Quali Server.
3. Click **Save** to save the settings. (If you wish to revert the settings, click **Revert**.)

Select a CloudShell License

The **Select a license** window enables you to license your CloudShell applications.

You can configure a mix of license settings, using different types of files for each application. For some applications, you can specify more than one type of license. For example, you could run CloudShell Authoring with a seat license (from the license file) and CloudShell Resource Manager with a floating license (from the license server).

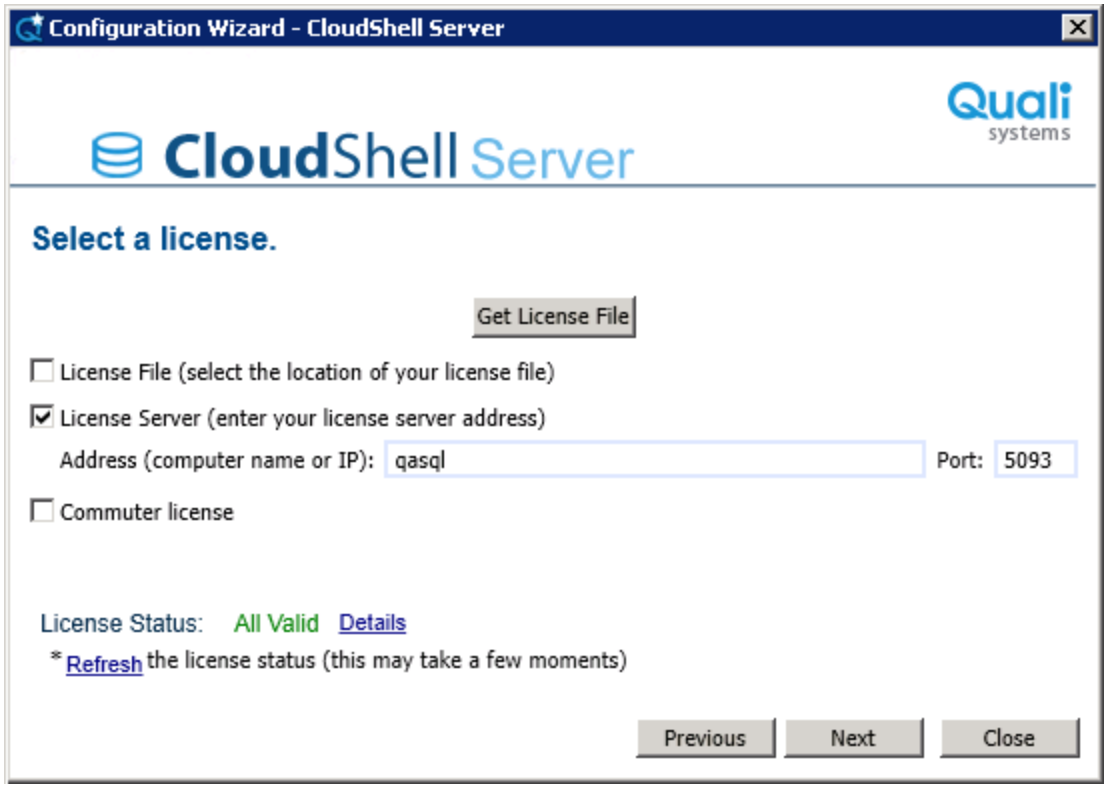
Select a license

To select a license:

1. The **Select a license** window, select the license type.
2. Since the license status does not update automatically, click **Refresh** to update the license information that you entered.
3. Verify that the **License Status** is now "All Valid".

Select a floating license

1. Select **License Server** to use a floating license from your organization's License server.

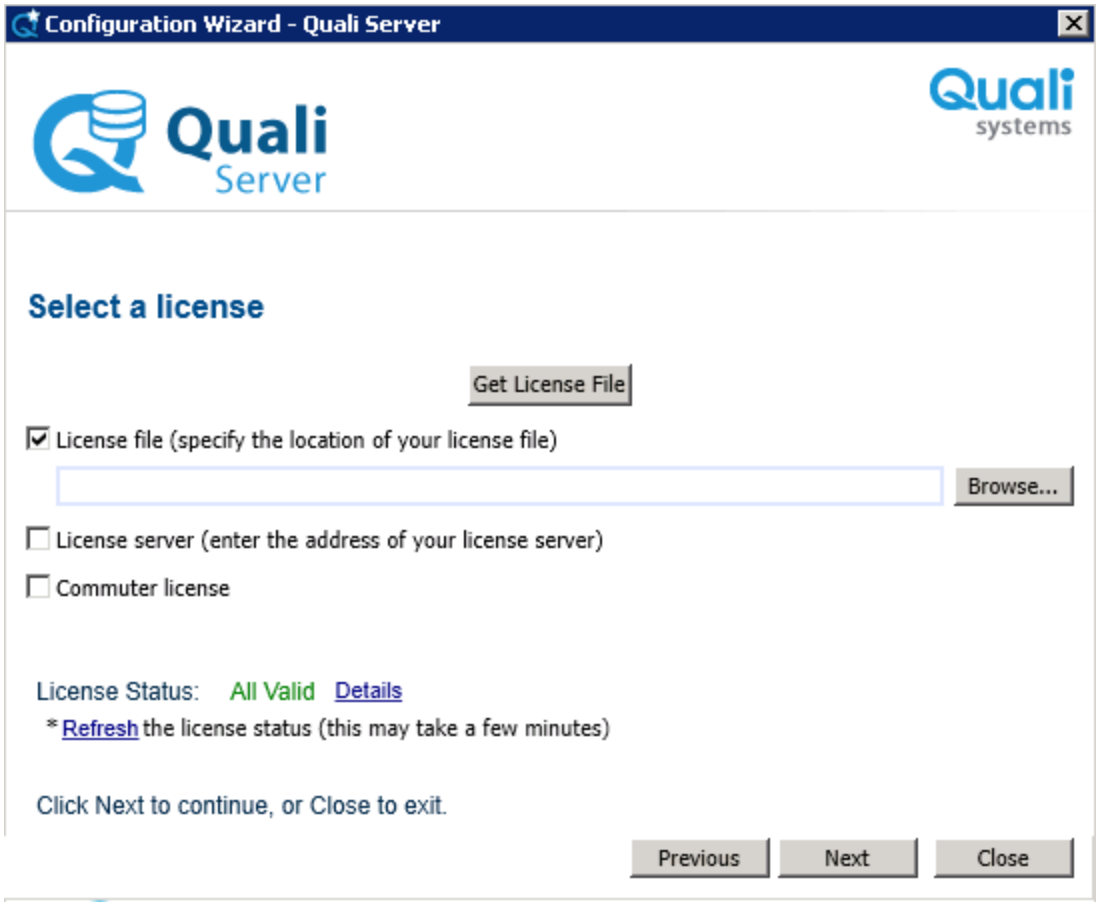


2. Enter the name or IP **Address** of the machine where the License Server is installed.
3. Leave the **Port** field value with the default (5093).

Select an installed license file

1. For a single station ("seat") license, you can either specify an installed license, or request a license based on your computer's ID.
2. If you already have a license installed, click **Browse** to search for and select the license file. The path to the selected license file is displayed in the **Select the location of your license**

file box.

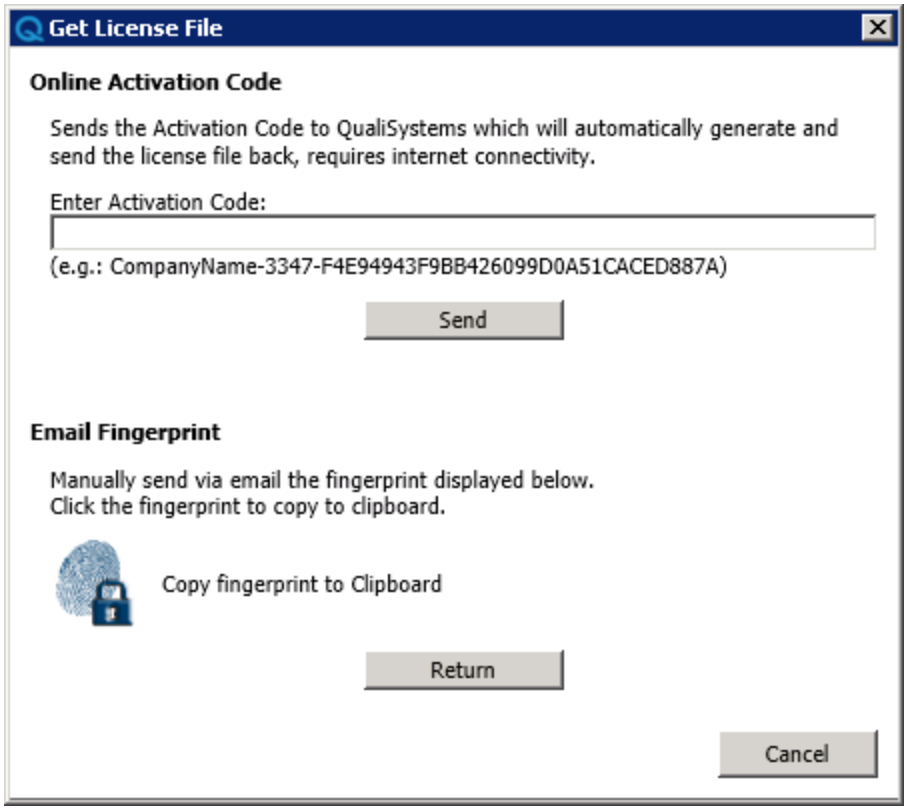


Get a license file

To get a license file:

1. Click the **Get License File** button.

   The **Get License File** dialog box is displayed.



2. In the **Online Activation Code** section, click the **Send** button to automatically generate an activation code from your computer's fingerprint.

   If you don't have a computer fingerprint, perform the following:

   a. Open the `C:\Program Files (x86)\QualiSystems\Licenses\` folder and make sure the `ActivatedLicense_<version#>.lsn` file doesn't exist. If it exists, rename it.

   b. In the **Online Activation Code** section, in the **Enter Activation Code** field, enter the activation code you received from Quali and click **Send**.

      A new `ActivatedLicense_<version#>.lsn` file is created in the `QualiSystems\Licenses` folder, listing all of your seat's features.

   c. If Quali Server and CloudShell License Server are installed on the same machine and you have two activation codes, one for Quali Server and one for the clients, rename the newly created `ActivatedLicense_<version#>.lsn` file.

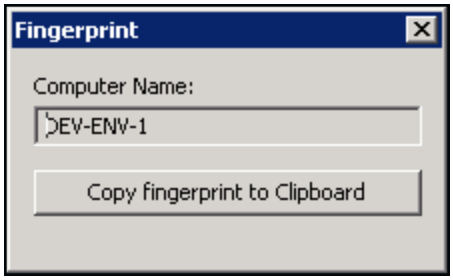
3. In the **Email Fingerprint** section, click **Copy fingerprint to Clipboard** to generate a fingerprint manually that you can send to QualiSystems, and have Quali send you the license file by email.
4. Copy the license file to your computer.
5. Click the **Browse** button next to the **License File** field to specify the location of the license file.

You can also use the fingerprint utility to generate a fingerprint.

To acquire the machine's fingerprint:

1. Open the `Utilities\Licensing\Fingerprint Viewer` folder from the installation package.
2. Double-click `Fingerprint.exe` to run the **Fingerprint** utility.

   The **Fingerprint** window opens with PC name and unique ID:

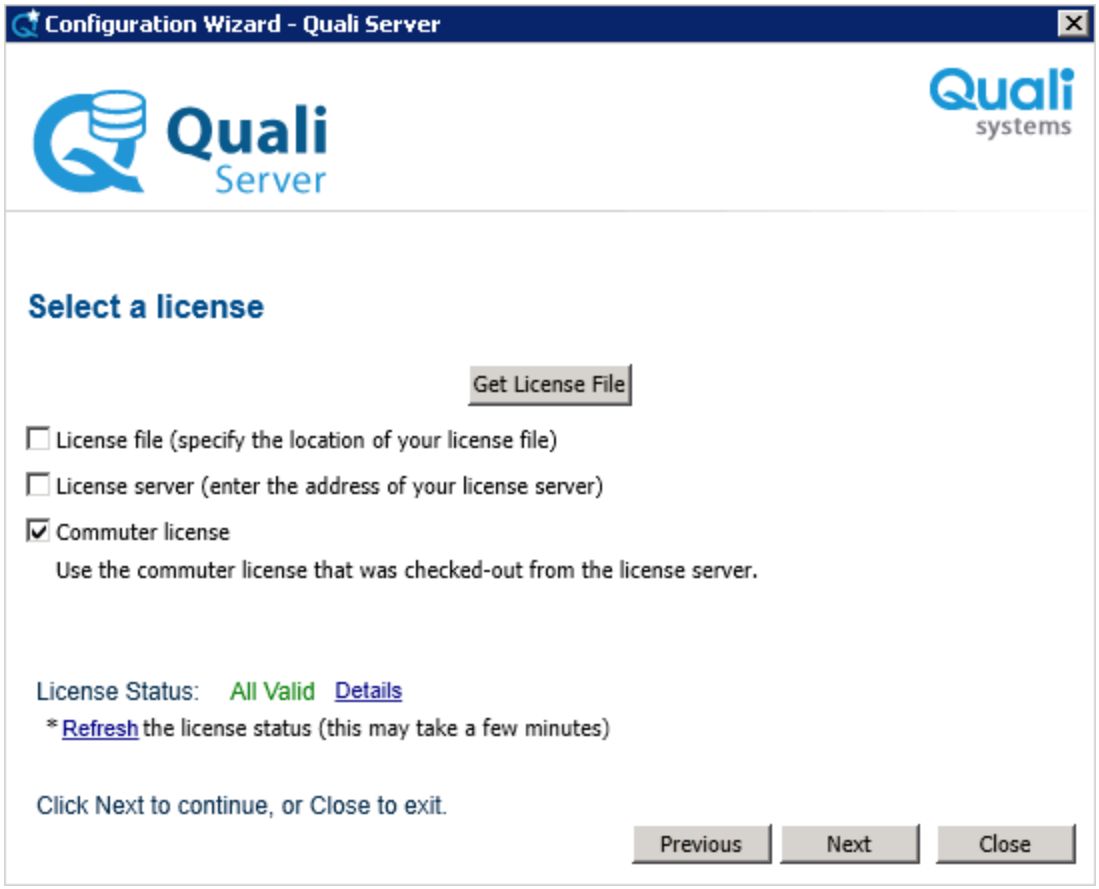
   

3. Click **Copy fingerprint to Clipboard**.
4. Paste the text to a file.
5. Send this copied information to Quali headquarters. In response, an email message which includes the license file is sent to your email address.

Note: Make sure that your version of the `Fingerprint.exe` file matches the CloudShell installation version.

Run a commuter license

- Select **Commuter License** to enable continuous use of a floating license from your organization's License Server.



Configure the Database Connection

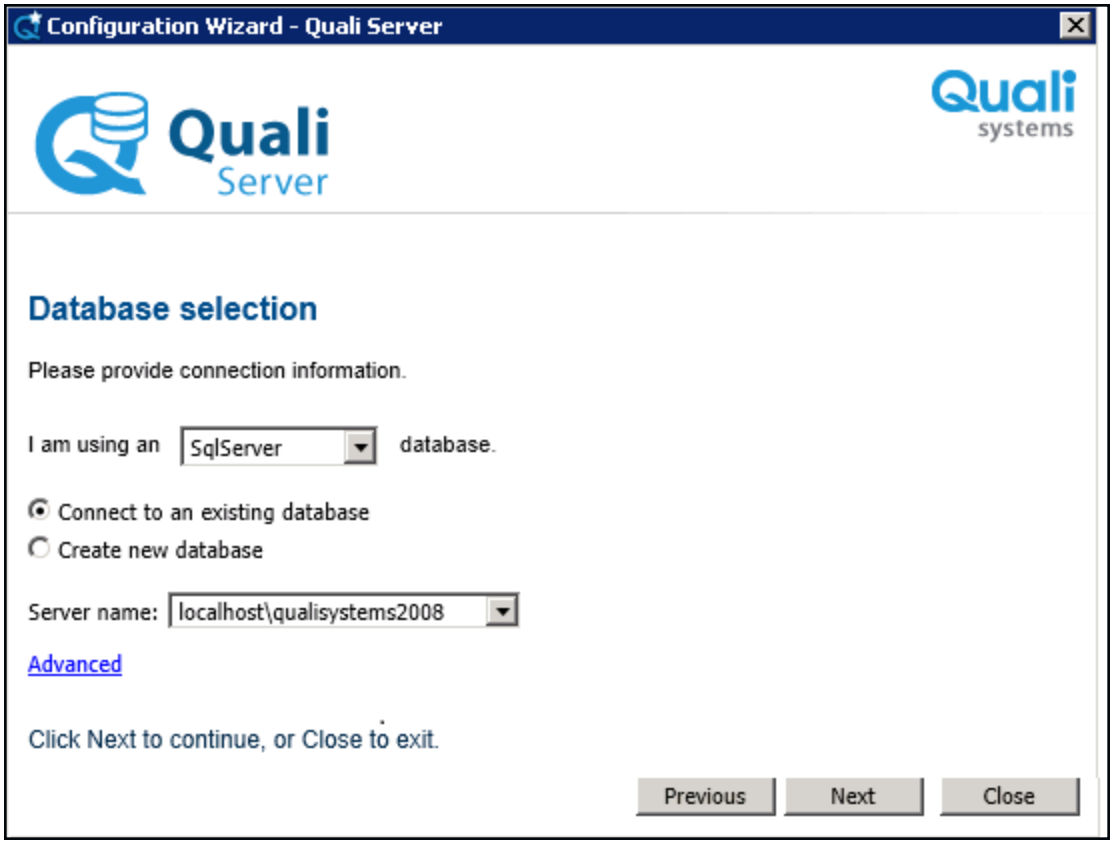
This section describes the database definition process in the database selection step. This procedure is the same for all server configuration tools.

Configure access to an SQL database

To configure access to an SQL database:

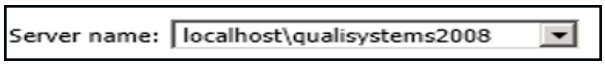
1. Specify Sql as the database type:

   In the **I am using an… database** field, select **SqlServer** from the dropdown list.



2. Specify whether to connect to an existing database or to create a new database.
   - If you are performing an update of the product and databases are already defined, select **Connect to an existing database**.
   - Otherwise, select **Create new database**.
3. Specify the database name.

   While using the built in SQL Express installation, verify that localhost\qualisystems2008 is displayed in the Server Name list box

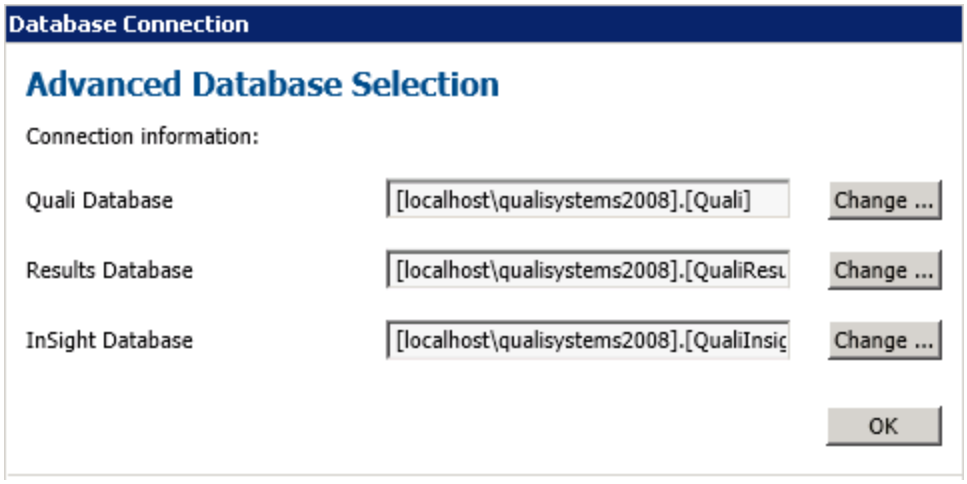
   

   Otherwise, select the SQL server instance from the **Server Name** dropdown list.
4. Enter a name for the new database and click **OK**.
5. Configure the databases manually and click **OK** to return to the CloudShell Configuration Wizard.
6. Select the **Connect to existing database** option and click **Next** to continue.

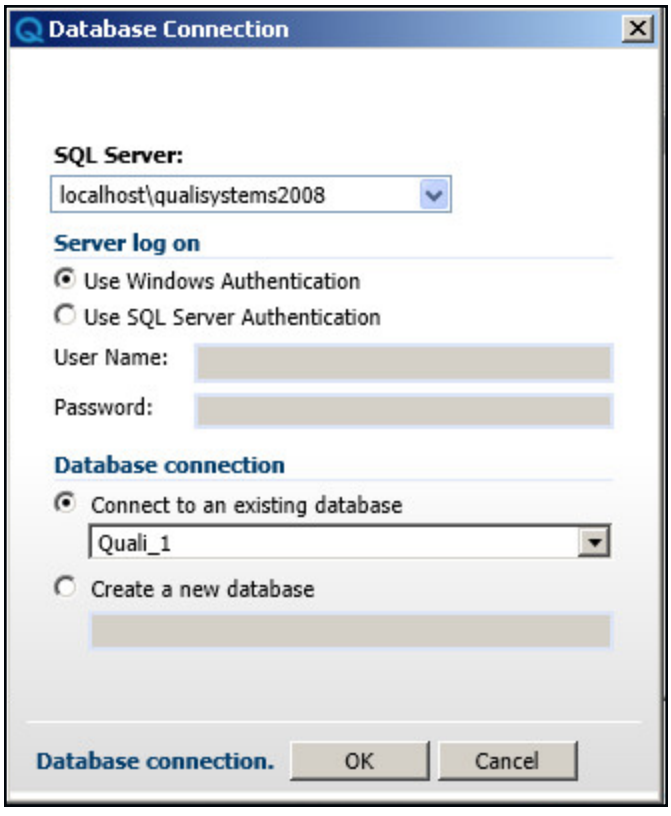
When selecting the **Create new database** option, the installer creates databases with default names.

To configure the database connections manually:

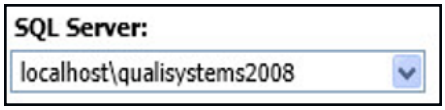
1. Click the **Advanced** link to open the **Advanced Database Selection** window.



2. Click **Change** next to the required database field to open the **Database Connection** window.



3. In the **SQL Server** field, verify that the location of the SQL server is correct.



While using the built in SQL Express installation, the **SQL Server** field should display `localhost\qualisystems2008`. Otherwise, select the SQL instance path from the drop-down list.

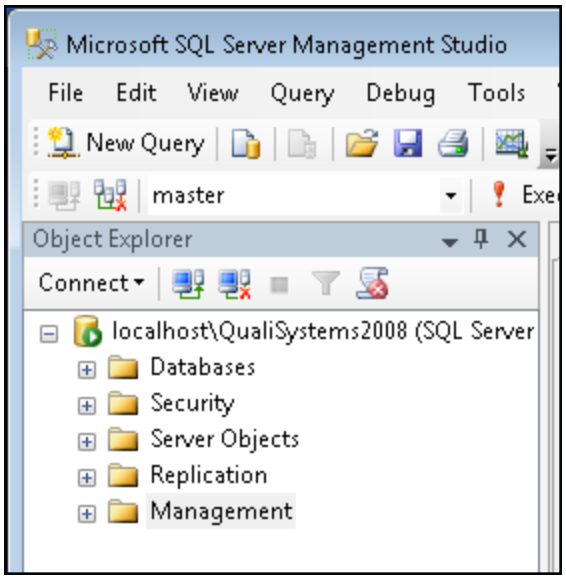
4. Click **OK**.

Move SQL Server default instance's folders

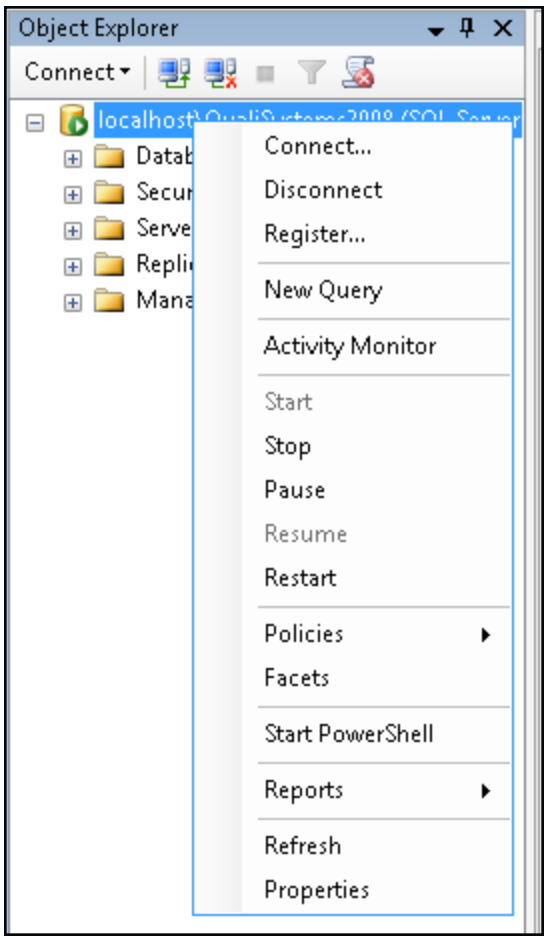
In certain cases, you might consider moving the database instance to another drive, for example, due to the restricted size of the current drive. If the SQL Server default instance's folders must be moved to a different path on the same server, follow the steps in the following procedure.

To move the SQL Server default instances' folders to a different path:

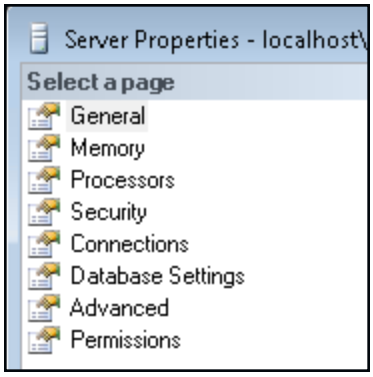
1. Open SQL Server Management Studio.



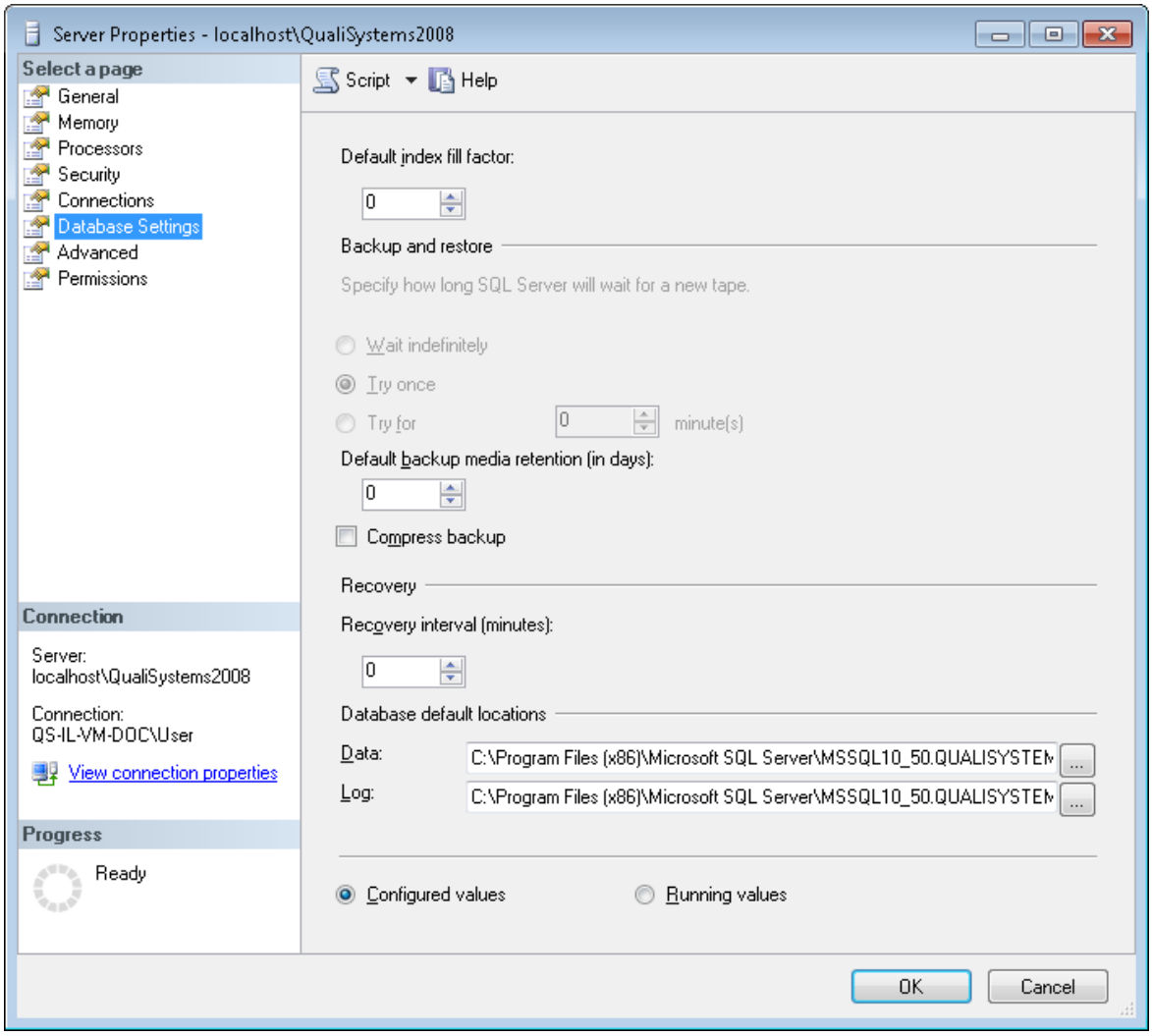
2. In Object Explorer, right-click the required server.



3. In the context menu, click **Properties**.



4. In the **Select a page** pane, click **Database Settings**.



5. Enter the new default pathnames in the **Data** or **Log** fields, or click the **Browse** button to navigate to the path.

For information on how move a system database, click this link.

Server Connectivity Settings

To configure server connectivity settings:

1. In the **Server Connectivity** window, specify the hostname or IP address of the Quali Server and your login settings.

2. Specify the connection credentials to use for connecting to the application server.
3. Enter the name or IP of the computer where Quali Server is installed. If the server is installed locally, use localhost as the server name.

   The default login settings are:

   Username: admin

   Password: admin

   For details how to change the username and/or the password, see Admin password.

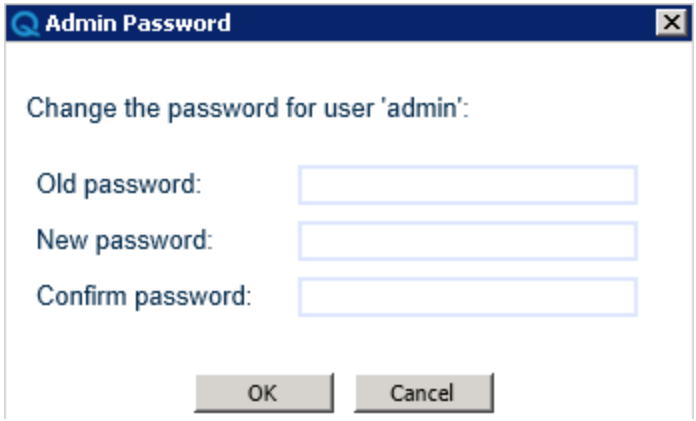
Admin Configuration Settings

Administrative tasks

- In the **Administrative Tasks** window, you can set the admin password, email and SMTP settings, assign users to groups and domains, and update data.

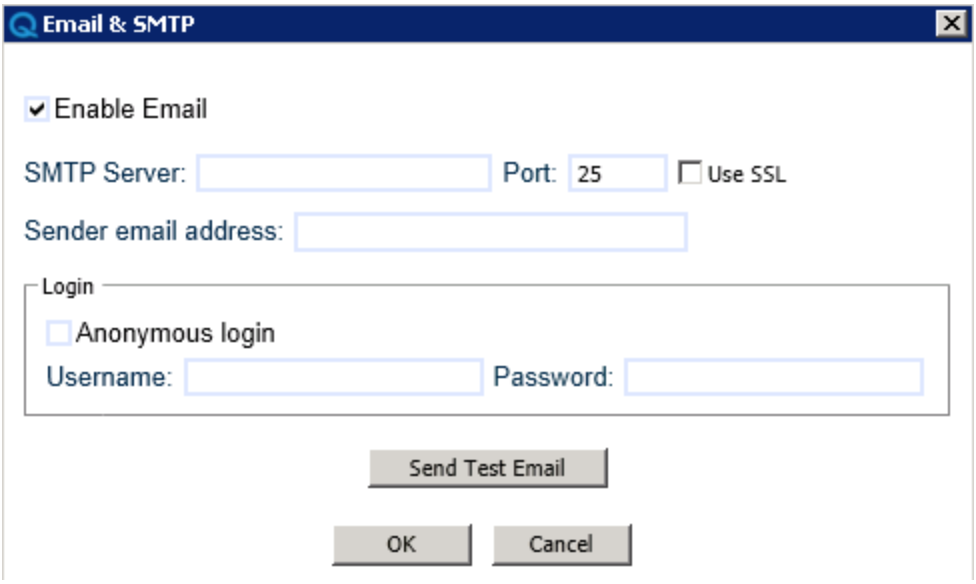
Admin password

- Click the **Admin Password** button to modify the administrator's password.



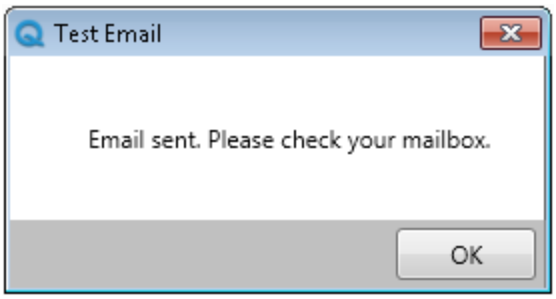
SMTP mail configuration

1. Click the **Email & SMTP** button. to configure SMTP email settings.



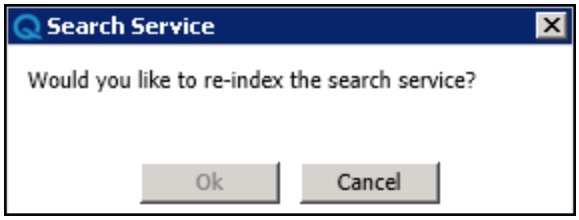
Note: After making changes to the SMTP settings, you need to stop and then restart the Quali Server service.

2. In the **SMTP Server** address box, enter the name of the mail server in your organization.
3. In the **Port** field, verify that the specified port for the mail server is correct. Otherwise, enter the correct port number.
4. Select the **Use SSL** check box for secure transmission.
5. In the **Sender email address** field, enter the email address that is used for sending emails.
6. If an anonymous login is not supported in the specified mail server, clear the **Anonymous login** check box. Then enter the username and password of the email sender.
7. After all inputs are specified, click the **Send Test Email** button to test sending an email with these settings. Enter a recipient email and click **OK** to send the test email.



Search service configuration

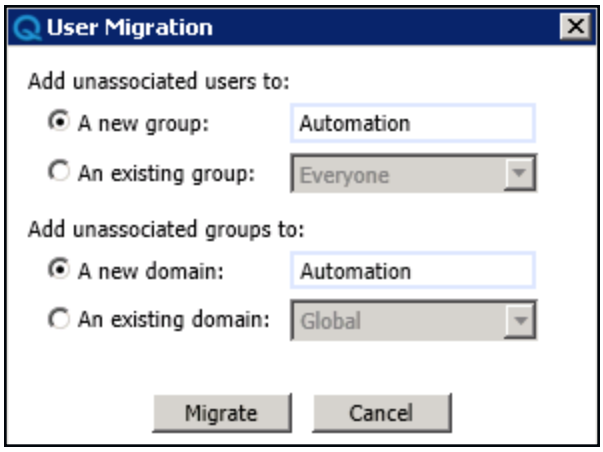
- Click the **Search Service** button to re-index the search service.



User migration

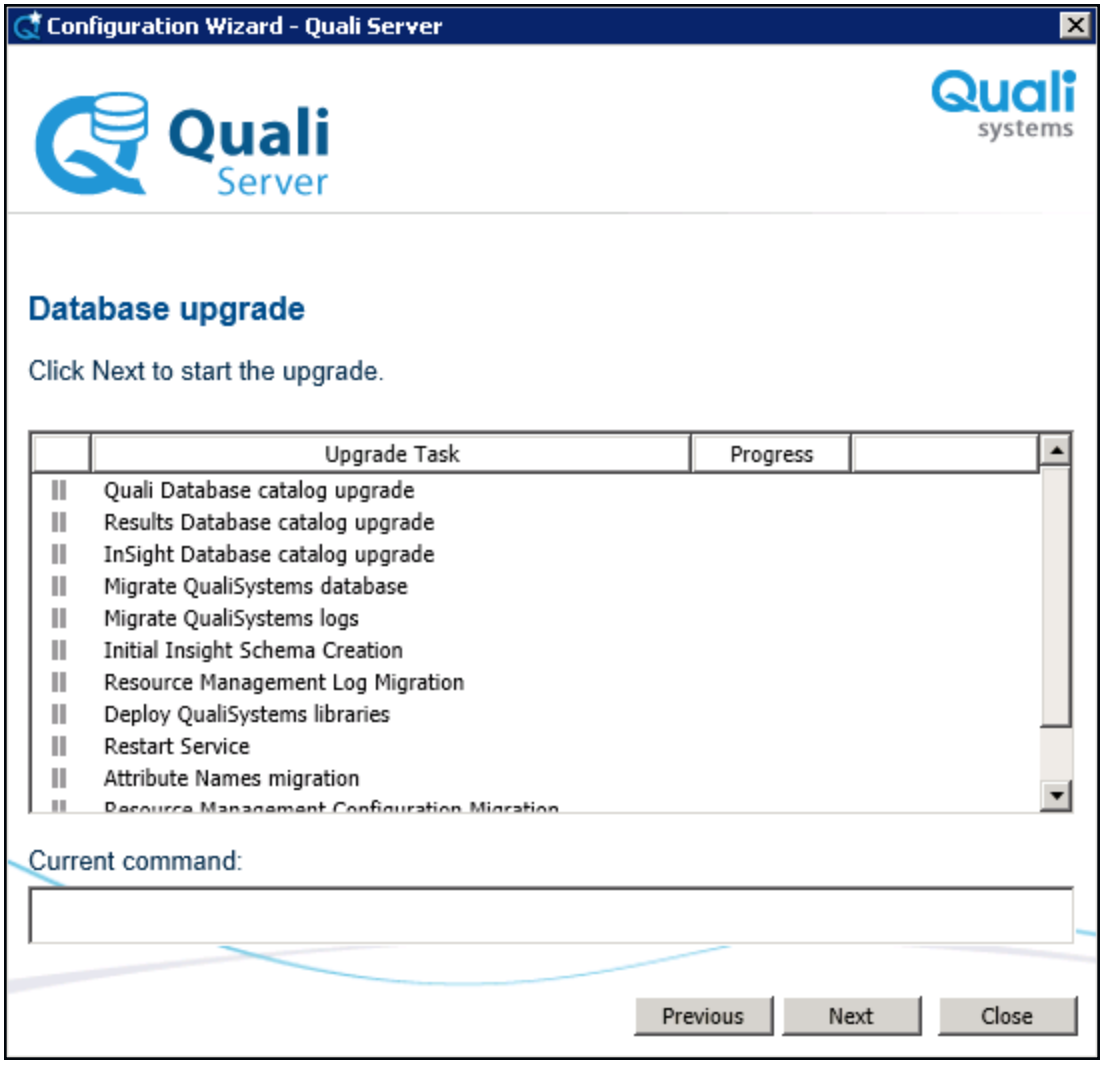
All CloudShell users must be associated with at least one group and one domain. Users without an associated domain are not able to login.

- Click the **User Migration** button to migrate any unassociated users with a default group and domain.



Server upgrade

For server applications, the **Upgrade** window shows the application data upgrade stages.


Configuration Wizard - Quali Server
Quali Server
Quali systems
Database upgrade
Click Next to start the upgrade.
Upgrade Task
Progress
Quali Database catalog upgrade
Results Database catalog upgrade
InSight Database catalog upgrade
Migrate QualiSystems database
Migrate QualiSystems logs
Initial Insight Schema Creation
Resource Management Log Migration
Deploy QualiSystems libraries
Restart Service
Attribute Names migration
Current command:
Previous
Next
Close

Installation Validation Procedure

This section describes the procedures to validate the installation.

Verify the status of installed services

1. Launch CloudShell Monitor.
2. Verify that CloudShell service is running with no errors.

Verify that Resource Manager is operational

1. Launch Resource Manager.
2. Create a new resource.
3. Create a new environment.
4. Create a new resource and add it to the environment.
5. Reserve and activate the environment.
6. Perform auto load for a Layer 1 chassis.

Known Issues and Troubleshooting

This sectionincludes known issues and topics to assist in troubleshooting while installing CloudShell Suite 7.0.

Known Installation Issues

Application	Description
All	There are two known issues for installing CloudShell on a “clean” PC with no existing components: • Setup may require a reboot. Make sure to log back in as the same user that started the installation. • If setup does not restart automatically, you have to restart it manually.
All	A new installation should run between 10-30 minutes. The installation itself takes less than 10 minutes. Initial configuration should not take more than 20 minutes.
Database	When SQL database is selected as the database type in a standalone installation, a separate instance of Microsoft SQL Express 2008 is installed.
All	Installing CloudShell prerequisites requires administration privileges on the installation machine.
All	There is a filename length limitation in CloudShell that forces the user to locate the installation files on a non-deep location (for example, c:\temp) before executing the installer.

Known Upgrade Issues

Application	Description
All	Although the CloudShell 7.0 installer should leave all of your current configurations intact, it does overwrite your existing applications. This may inadvertently affect some of your current settings. It is therefore imperative to back up your databases before upgrading.
TestShell	Updating drivers using TestShell API assets:

Application	Description
API	• After upgrading to CloudShell 7.0, you need to manually update the TestShell API asset in Authoring, and then recompile any drivers using the API methods. • Drivers using the API to update values in the Quali Server only require updating of the asset.
Check in all libraries prior to upgrading	Verify that all the libraries are checked in. Checked out libraries are indicated by a different color icon. The parent folder also indicates if the folder contains a checked-out library.
All	Upgrading to version 7.0 EA is supported from the following versions: • 6.4 GA (and patches) • 6.3 GA (and patches) • 6.2.3 GA (and patches) When upgrading from versions earlier than 6.2.3 GA, you must first upgrade to one of the above versions and then to 7.0 EA. **Note:** Patches must be installed on GA versions only. Installing a patch on a non-GA version will result in unexpected behavior which may corrupt the database.
All	Real-time virus protection may affect performance.

Troubleshooting

Microsoft Distributed Transactions Coordinator (MSDTC)

In this section:

MSDTC security configuration

Possible reasons for incorrect MSDTC configuration include:

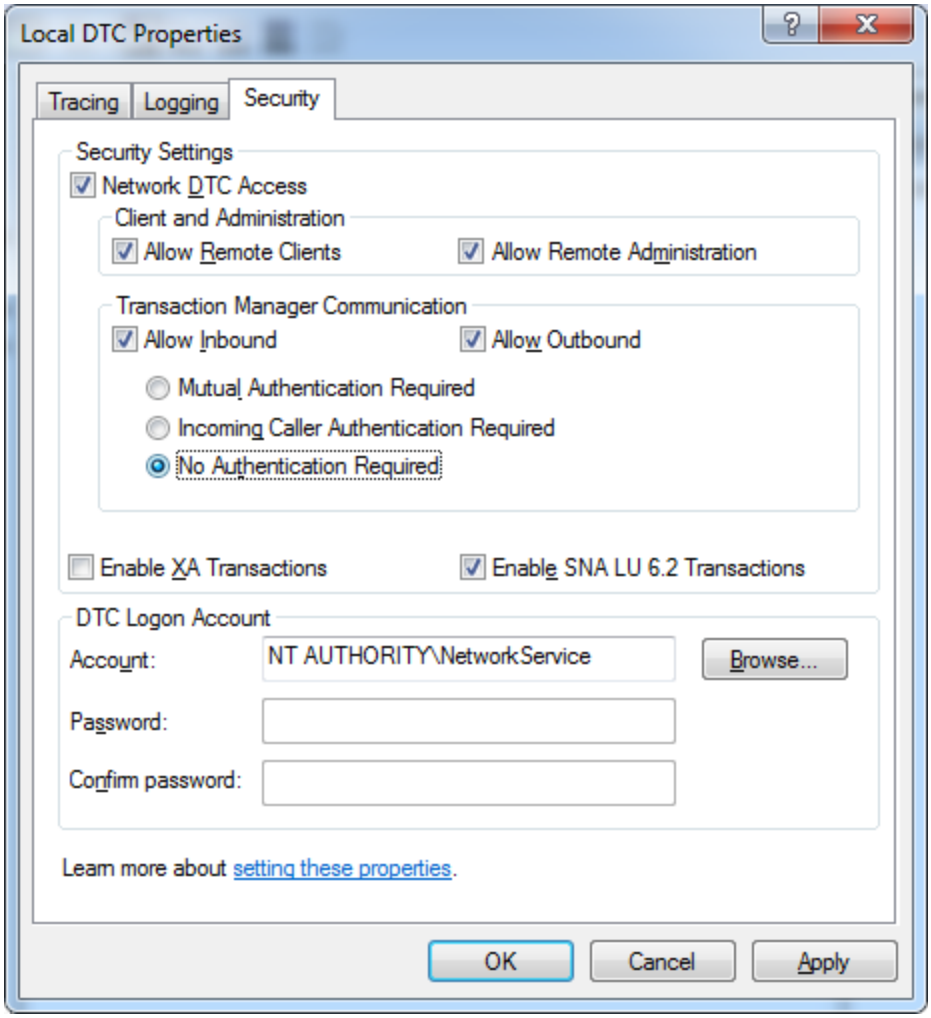
- MSDTC is not installed.
- MSDTC is not configured to start automatically in Windows Services.

- Security configurations of MSDTC are not correctly defined.

To run the CloudShell Suite applications, configure MSDTC Security settings in machines where databases are installed.

For all supported versions of Windows:

1. Go to **Control Panel > Administrative Tools > Component Services** (or **Start > Run > dcomcnfg**).
2. From the left navigation tree, drill down to **Component Services > Computers > My Computer > Distributed Transaction Coordinator > Local DTC**.
3. Right-click **Local DTC** and select **Properties** from the context menu.
4. In the **Security** tab, select the following options:
    - Network DTC Access
    - Allow Remote Client
    - Allow Remote Administration
    - Allow Inbound
    - Allow Outbound
    - Enable SNA LU 6.2 Transactions
    - No Authentication Required



5. Apply the changes.

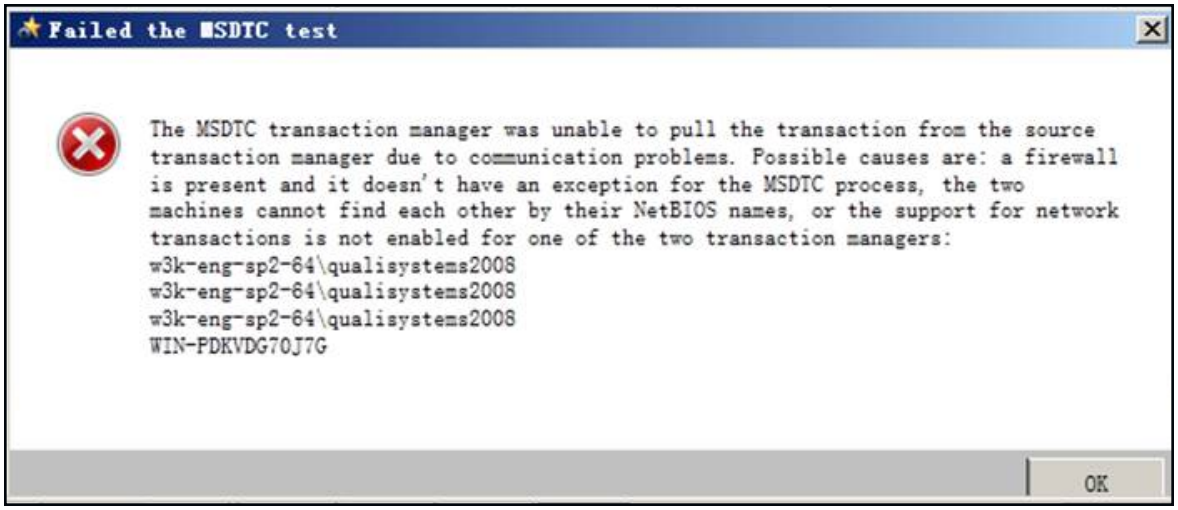
   The service restarts. However, you may have to restart the computer(s).

For all operating systems, define the Distributed Transaction Coordinator service to start-up automatically:

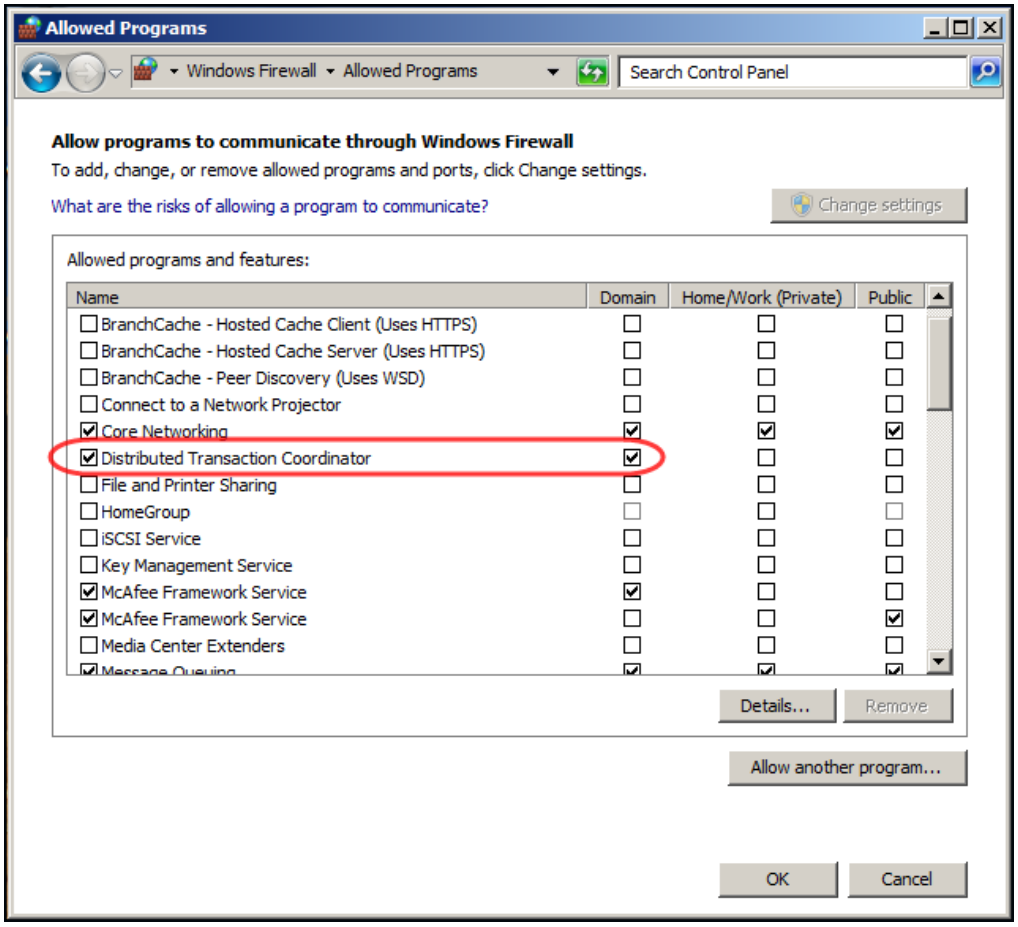
1. Choose **Start > Run** and type **services.msc** and press **Enter**.
2. In the **Services** window, right-click **Distributed Transaction Coordinator**, and select **Properties** from the context menu.
3. In the **Startup type** dropdown list, select **Automatic**.
4. Click **OK** to close the Properties window.

Firewall settings

1. When installing on Windows 7 or Windows Server 2008 OS with East Asian languages, the following error may appear:



2. To resolve this problem make sure that Distributive Transaction Coordinator is permitted to communicate through Microsoft Firewall.



3. Open **Control Panel > System and Security > Windows Firewall > Allowed Programs** and select **Distributed Transactions Coordinator**.

Databases

In this section:

Database permissions

When creating a new database or using an existing database on a remote database server, the following warning message may appear if local user has no permissions to open a remote database:

To grant CloudShell users permissions for a database on a remote machine:

1. In the **User** field, enter the Local System user or Domain User name.
2. Specify the full path, for example:

   <Domain>\<Username>

   -or-

   <Local User on RemoteMachine>\<Username>
3. In the **Password** field, enter the user's password.
4. Confirm the user password and click **OK** to proceed.

Remote MSDTC configuration issues

If the remote database machine has an incorrect MSDTC configuration, the system might issue an error message. For more information to resolve this problem, see MSDTC security configuration.

Fixed server roles

The following table describes fixed server roles. For more information, click this link.

Role	Description	Required for?
sysadmin	Members of the sysadmin fixed server role can perform any activity in the server, for example, set up and maintain	Required for High

Role	Description	Required for?
	the system or server.	Availability (HA) and Quali Server
serveradmin	Members of the serveradmin fixed server role can change server-wide configuration options and shut down the server.	Required for HA
securityadmin	Members of the securityadmin fixed server role manage logins and their properties. They can GRANT, DENY, and REVOKE server-level permissions. They can also GRANT, DENY, and REVOKE database-level permissions if they have access to a database. Additionally, they can reset passwords for SQL Server logins.	Used only by DB admin
processadmin	Members of the processadmin fixed server role can end processes that are running in an instance of SQL Server.	Might be required during installation
setupadmin	Members of the setupadmin fixed server role can add and remove linked servers by using Transact-SQL statements. (sysadmin membership is needed when using SQL Management Studio.)	Required for HA
bulkadmin	Members of the bulkadmin fixed server role can run the BULK INSERT statement.	Required during normal operation
diskadmin	The diskadmin fixed server role is used for managing disk files.	Not required from app perspective
dbcreator	Members of the dbcreator fixed server role can create, alter, drop, and restore any database.	Required during installation

Role	Description	Required for?
Public	Every SQL Server login belongs to the public server role. When a server principal has not been granted or denied specific permissions on a securable object, the user inherits the permissions granted to public on that object. Only assign public permissions on any object when you want the object to be available to all users. You cannot change membership in public.	Required during normal operation

Network Time Protocol Server

In certain cases Quali Server, QualiX, and Client machines might be synced against different Network Time Protocol (NTP) servers and therefore have slight time differences, causing issues with token-based authentication.

For information about how to resolve this issue, click this link.

Quali customer support

- Customer support for CloudShell applications is available through the Quali Support Center.
- In addition to the knowledge base and community forums, customers can submit and track their support requests through the Quali Support Center.

Documentation

- Additional technical documentation is available in the Quali Support Center.
- Operational documentation for all CloudShell 7.0 applications is available by clicking the **Help** option in any CloudShell application.
- For Quali discussion forums, you can access the Quali Support Center.

Utilities and Layer 1 Drivers

This section describes the utilities and Layer 1 (L1) drivers that are installed with CloudShell.

Utilities

CloudShell 7.0 includes the utilities listed in the following tables:

System utilities

Utility	Description	Location
CloudShell Monitor	Stores and centralizes logs from all installed CloudShell applications. CloudShell Monitor can also be used to start and stop CloudShell services.	Start menu> QualiSystems > Tools > CloudShell Monitor

Configuration utilities

Utility	Description	Location
CloudShell Configuration Wizard	Configuration wizard for configuration of installed CloudShell applications.	Start menu > QualiSystems > Tools > CloudShell Configuration Wizard
Runtime utilities		
CloudShell Runtime Configuration	Runtime support for external script engines.	Start menu > QualiSystems > Tools > CloudShell Runtime Configuration
Remote Runner Service	The Remote Runner Service is a runner managed through Windows services for running scripts and commands in the background. The Remote Runner Service is not required for executing scripts or commands through the Remote Runner GUI.	Windows Services > CloudShell Remote Runner
CloudShell Spy	A runtime debugger that displays running steps when executing a CloudShell Authoring executable project.	Start menu > QualiSystems > Tools > CloudShell Spy

Utility	Description	Location
	Installed with CloudShell Runtime.	

Runtime utilities

Utility	Description	Location
CloudShell Runtime Configuration	Runtime support for external script engines.	Start menu > QualiSystems > Tools > CloudShell Runtime Configuration
Remote Runner Service	The Remote Runner Service is a runner managed through Windows services for running scripts and commands in the background. The Remote Runner Service is not required for executing scripts or commands through the Remote Runner GUI.	Windows Services > CloudShell Remote Runner
CloudShell Spy	A runtime debugger that displays running steps when executing a CloudShell Authoring executable project. Installed with CloudShell Runtime.	Start menu > QualiSystems > Tools > CloudShell Spy

Additional configuration files and utilities

Additional configuration files and utilities that are available from the installation archive include:

Utility	Description	Location
Updated resource family definitions	Updated definitions for installed resource family and models. The updates are mandatory for L1 switches* and optional for other devices. *The definitions are included with every driver as well. If you import an updated L1 driver, you do not have to perform this update.	Installation archive\Resource Manager Additional Files\Configuration\system.xml

L1 drivers

CloudShell 7.0 includes the following Layer 1 (L1) drivers and driver configuration files, which are installed in the `CloudShell\Server\Drivers` folder.

The list of supported switches for each driver is included in the driver configuration files.

More information on supported drivers is available in the download page for L1 Switch Drivers which is linked from the main QualiSystems' Download Center.

Driver	Version	Driver configuration file	Supported firmware
MRV_MCC_4640	3.0.18.5	MRV_MCC_4640_RuntimeConfig.xml	MRV v4.6 mcc 04
MRV_MCC_4840	3.0.18.5	MRV_MCC_4840_RuntimeConfig.xml	MRV v4.8 mcc 04
MRV_MCC_4870	3.0.18.5	MRV_MCC_4870_RuntimeConfig.xml	MRV v4.8 mcc 07
ONPATH_Horizon_0244	3.0.18.5	ONPATH_Horizon_0244_RuntimeConfig.xml	Horizon 2.4.4
CW_GLX4000	3.0.14	CW_GLX4000_RuntimeConfig.xmls	LXfw v1.10.0.0
APCON_AGGREGATE	3.0.17	APCON_AGGREGATE_RuntimeConfig.xml	CLI3-4
APCONCLI4	3.0.18.3	APCON_CLI4_RuntimeConfig.xml	CLI3-4
Calient_S_5.2-7	3.0.18.3	Calient_S_5.2-7_RuntimeConfig.xml	Calient S-Series 5.2-7
Calient_FC_2301	3.0.18.3	Calient_FC_2301_RuntimeConfig.xml	Calient FiberConnect 2.3.0.1
FiberZone_AFM	3.0.17	FiberZone_AFM_RuntimeConfig.xml	FiberZone_AFM 5.2.0.5
FiberZone_AFM_C3	3.0.18.2	FiberZone_AFM_C3_RuntimeConfig.xml	FiberZone_AFM_C3 5.2.0.5
JUNOS_	3.0.18.3	JUNOS_12.3R3.4_	MX/EX SW

Driver	Version	Driver configuration file	Supported firmware
12.3R3.4 (L2 as L1)		RuntimeConfig.xml	versions 12.3R3.4

Quali Certified Libraries

This section describes the libraries that are provided with CloudShell.

API libraries

The API libraries provide external access to CloudShell functionality.

Library	Version	Description
TestShell API	7.0	TestShell API, which extends many of the CloudShell features for use through automation or 3rd parties including: lab, user, and domain management, resource, environment, and reservation operations, and more.
TestShellAPICore	7.0	Used to build drivers in the Authoring application.
Quali API	6.2.0.6	Quali API supports the Scheduling and Queuing functionality and associated Quali API functions
REST Client	1.0.7.0	A simple API for Representational State Transfer (REST) commands and communication. The library is designed to let the user connect, authenticate and send REST requests.
RESTSharp	105.1.0	Used by Quali API. It is a library for.NET technology.

Other libraries

Editor, virtualization, traffic and device manager libraries are available from the Qualisystems' Download Center.