

Exchange EWS Test Suite Deployment Guide

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# Overview

The Exchange Server EWS Protocol Test Suites are implemented as synthetic clients running against a server-side implementation of a given Exchange protocol. They are designed in a client-to-server relationship and were originally developed for the in-house testing of the Microsoft Open Specifications. Test Suites have been used extensively in Plugfests and Interoperability Labs to test partner implementations.

The Exchange EWS Test Suite Deployment Guide introduces the hardware and software requirements of the test suite client, and the requirements of the system under test (SUT) if the test suites run against Exchange Server. The guide also introduces how to deploy, configure and run the test suites, and view test suite reports.

# Prerequisites

This section describes the hardware and software requirements for the test suites. In an Exchange server environment, the test suite installation takes place on both the client and server side. The following information will help test suite users to plan their deployment.

## Hardware requirements

### System under test

The SUT is the server side of the test suite environment. Exchange server(s) and Active Directory have defined system requirements which should be taken into account during deployment. The Exchange Server EWS Protocol test suites do not have any additional SUT resource requirements.

### Test suite client

The test suite client is the client side of the test suite environment. The following table shows the minimum resource requirements for the test suite client.

Test suite client resource requirements

|  |  |
| --- | --- |
| Component | Test suite client minimum requirement |
| RAM | 2GB |
| Hard Disk | 3G of free space |
| Processor | >= 1GHz |

## Software requirements

### System under test

This section is only relevant when running the test suites against the following versions of Exchange Server:

* Microsoft Exchange Server 2007 Service Pack 3 (SP3)
* Microsoft Exchange Server 2010 Service Pack 3 (SP3)
* Microsoft Exchange Server 2013 Service Pack 1 (SP1)

The following table describes the necessary server roles required for a test suite deployment with a Microsoft implementation. Installing Exchange Server on a domain controller (DC) is not recommended.

Required SUT roles

|  |  |
| --- | --- |
| Role | Description |
| **Active Directory Domain Controller (AD DC)** | Active Directory Domain Controller provides secure data for users and computers. An AD DC can coexist with an Exchange server. A typical test configuration has an AD DC and Exchange Server installed on separate machines. |
| **Exchange Server (SUT)** | The Exchange server in the topology. |

The following diagram is an example of what a typical Exchange test suite environment may look like. This example uses an IPv4, but IPv6 is also supported by the test suites.



### Test suite client

This section describes the prerequisite software for installing the Exchange Server EWS Protocol test suites on the test suite client. The following table outlines the software dependencies for the test suite client.

Test suite client software dependencies

|  |  |
| --- | --- |
| **Operating systems** | Windows 7 x64 Service Pack 1 and above  Windows 8 x64 and above  Windows 2008 R2 x64 Service Pack 1 and above |
| **Software** | Microsoft Visual Studio 2013 Professional  Microsoft Protocol Test Framework 1.0.2220.0 and above |

# Deploying the test suites

This section describes the deployment of the Exchange Server EWS Protocol test suites on the test suite client and the SUT. The Exchange Server EWS Protocol test suites are packaged in a .zip file which is available on [Microsoft Connect](http://go.microsoft.com/fwlink/?LinkId=516921). Once you download the test suites, you need to perform the following steps in order to be able to successfully configure the test suites.

1. Extract the **Exchange Server EWS Protocol Test Suites** folder to a directory of your choice on the test suite client.
2. Copy the **SUT** folder under **…\Exchange Server EWS Protocol Test Suites\Setup** to a directory of your choice on the SUT. The SUT configuration scripts are the only requirement for the SUT. The scripts facilitate the SUT configuration process and are contained within the **ExchangeServerEWSProtocolTestSuites.zip** file.

# Test suite directories

In this section you will find a list of the folder structures that are contained within the **ExchangeServerEWSProtocolTestSuites.zip** file.

ExchangeServerEWSProtocolTestSuites.zip file contents

|  |  |
| --- | --- |
| Directory/file | Description |
| EULA.rtf | The End-User License Agreement |
| ReadMe.txt | A file that contains information about the deployment guide and prerequisite software. |
| Exchange Server EWS Protocol Test Suites |  |
| - Docs | A directory that contains documents of all protocol test suites. |
| - ExchangeEWSTestSuiteDeploymentGuide.docx | A file relevant to the protocol test suite deployment guidance |
| -  ExchangeEWSTestSuiteSpecification.docx | Contains test suite-specific configuration details, architecture, and test case details. |
| + MS-XXXX | MS-XXXX Help documentation |
| - [MS-XXXX].pdf | The technical specification for the protocol. |
| - MS-XXXX \_SUTControlAdapter.chm | Contains information about the SUT control adapter class library such as declaration syntaxes and their description. |
| - MS-XXXX \_RequirementSpecification.xlsx | A spreadsheet that outlines all requirements associated with the technical specification. |
| - Setup | A directory that contains configuration scripts. |
| - Test Suite Client | A directory that contains the configuration script to configure the test suite client. |
| - ExchangeClientConfiguration.cmd | A command file that runs the ExchangeClientConfiguration.ps1 file to configure the properties for the protocol test suites. |
| - ExchangeClientConfiguration.ps1 | A configuration script that will be triggered by the ExchangeClientConfiguration.cmd. |
| - SUT | A folder that contains the configuration script to configure the Exchange Server |
| - ExchangeSUTConfiguration.cmd | A command file that runs the ExchangeSUTConfiguration.ps1 file to create resources and configure settings on the SUT. |
| - ExchangeSUTConfiguration.ps1 | A configuration script that will be triggered by ExchangeSUTConfiguration.cmd. |
| - Common | A directory that contains common configuration scripts. |
| - CommonConfiguration.ps1 | A configuration script to configure the common information of the server and the test suite client. |
| - ExchangeCommonConfiguration.ps1 | A configuration script to configure the common information of Exchange server. |
| - ExchangeTestSuite.config | A configuration file that contains primary SUT configuration resources of all protocol test suites. |
| - Source | A folder with Microsoft Visual Studio solutions that contain source code for the test suites. |
| - Common | A folder with Microsoft Visual Studio projects that contains source code that are common to the test suites. |
| - ExchangeCommonConfiguration.deployment.ptfconfig | The common configuration file. |
| - ExchangeEWSProtocolTestSuites.sln | A Visual Studio solution that contains projects of the protocol test suites source code. |
| - ExchangeServerEWSProtocolTestSuites.runsettings | A configuration file used for unit test. |
| - ExchangeServerEWSProtocolTestSuites.testsettings | A configuration file used for running test cases. |
| - MS-XXXX | MS-XXXX test suite code directory. |
| - MS-XXXX.sln | A Microsoft Visual Studio solution that contains projects of the MS-XXXX test suite. |
| - MS-XXXX.runsettings | A configuration file used for MS-XXXX unit test. |
| - MS-XXXX.testsettings | A configuration file used for running MS-XXXX test cases. |
| + Adapter | Adapter test suite code. |
| + TestSuite | Test suite code. |
| - Scripts | Exchange Server EWS test suites can be run using Visual Studio or through batch scripts. The Scripts directory contains a collection of command files that allows users to run specific test cases in the test suite, or the entire test suite. |
| - RunAllExchangeEWSTestCases.cmd | A script that can be used to run all test cases in the package. |
| - MS-XXXX | A folder containing scripts that belong to the MS-XXXX test suite. |
| - RunAllMSXXXXTestCases.cmd | A script that can be used to run all test cases of MS-XXXX. |
| - RunMSXXXX\_SXX\_TCXX\_Name.cmd | A script that can be used to run a single test case of MS-XXXX. |

# Configuring the test suites

This section provides the necessary guidance to configure the Exchange Server EWS Protocol test suites on the SUT and the test suite client. The configuration should be done in this order: configure the SUT, and then configure the test suite client.

For the configuration script, the exit code definition is as follows:

1. A normal termination will set the exit code to 0.
2. An uncaught THROW will set the exit code to 1.
3. Script execution warning and issues will set the exit code to 2.
4. Exit code is set to the actual error code for other issues.

## Configuring the SUT

You can configure the SUT using automated scripts, as described in sections [5.1.2](#_Configuring_the_SUT1_2); or configure the SUT manually, as described in section [5.1.3](#_Configuring_the_SUT1).

**Note**   The scripts should be run by a user who has domain administrator rights with a mailbox on the SUT.

### SUT resource requirements

Each test suite contained within the Exchange Server EWS Protocol test suites package may require/ varying levels of resources on the SUT. The following table outlines these resources for each test suite. The SUT configuration scripts will automatically create all the required resources for the Microsoft server implementation.To configure the SUT manually, see section [5.1.3](#_Configuring_the_SUT1).

The client configuration script follows the naming convention shown in the following table. If a change to the resource name is required, the corresponding change to the resource name defined in the client configuration script will be required.

Exchange server resources

|  |  |  |  |
| --- | --- | --- | --- |
| Test suite | Resource type | Resource name | Note |
| All | -- | -- |  |
| MS-OXWSATT | Mailbox | MSOXWSATT\_User01 | Mailbox type user |
| MS-OXWSBTRF | Mailbox | MSOXWSBTRF\_User01 | Mailbox type user |
| MS-OXWSCONT | Mailbox | MSOXWSCONT\_User01 | Mailbox type user |
| MS-OXWSCORE | Mailbox | MSOXWSCORE\_User01 | Mailbox type user |
|  | Mailbox | MSOXWSCORE\_User02 | Mailbox type user |
|  | Public Folder Mailbox | MSOXWSCORE\_PublicFolderMailbox | Public Folder Mailbox created for the public folder of the organization configuration of Exchange 2013. |
|  | Public Folder | MSOXWSCORE\_PublicFolder |  |
| MS-OXWSFOLD | Mailbox | MSOXWSFOLD\_User01 | Mailbox type user |
|  | Mailbox | MSOXWSFOLD\_User02 | Mailbox type user |
|  | ManagedFolder | MSOXWSFOLD\_ManagedFolder1 | Managed folder created directly in the root path of Outlook |
|  | ManagedFolder | MSOXWSFOLD\_ManagedFolder2 | Managed folder created directly in the root path of Outlook |
|  | Public Folder Database | PublicFolderDatabase | Public Folder Database created for the mailbox of the organization configuration of Exchange 2010 and for the server configuration of Exchange 2007. |
| MS-OXWSMSG | Mailbox | MSOXWSMSG\_User01 | Mailbox type user |
|  | Mailbox | MSOXWSMSG\_User02 | Mailbox type user |
|  | Mailbox | MSOXWSMSG\_User03 | Mailbox type user |
|  | Mailbox | MSOXWSMSG\_Room01 | Mailbox type room |
| MS-OXWSMTGS | Mailbox | MSOXWSMTGS\_User01 | Mailbox type user |
|  | Mailbox | MSOXWSMTGS\_User02 | Mailbox type user |
|  | Mailbox | MSOXWSMTGS\_Room01 | Mailbox type room |
| MS-OXWSSYNC | Mailbox | MSOXWSSYNC\_User01 | Mailbox type user |
|  | Mailbox | MSOXWSSYNC\_User02 | Mailbox type user |
| MS-OXWSTASK | Mailbox | MSOXWSTASK\_User01 | Mailbox type user |

### Configuring SUT using the setup configuration script

The setup configuration script is only used for configuring the SUT on the Windows platform.

To configure SUT using the setup configuration script, navigate to the **SUT** folder, right-click **ExchangeSUTConfiguration.cmd** and select **Run as administrator**.

### Configuring SUT manually

If the SUT is a non-Microsoft implementation of Exchange Server, you will not be able to run the setup configuration script. The following steps explain what needs to be created or configured on the SUT in order to run the test suites.

1. Create the following mailbox users:

MSOXWSATT\_User01, MSOXWSBTRF\_User01, MSOXWSCONT\_User01, MSOXWSCORE\_User01, MSOXWSCORE\_User02, MSOXWSFOLD\_User01, MSOXWSFOLD\_User02, MSOXWSMSG\_User01, MSOXWSMSG\_User02, MSOXWSMSG\_User03, MSOXWSMSG\_Room01, MSOXWSMTGS\_User01, MSOXWSMTGS\_User02, MSOXWSMTGS\_Room01, MSOXWSSYNC\_User01, MSOXWSSYNC\_User02, MSOXWSTASK\_User01

1. Configure Secure Sockets Layer (SSL) as not required and set to ignore client certificates on the website which contains the application that implements the EWS protocols.
2. Assign the **ApplicationImpersonation** role to the following mailbox users.

**Note** This role enables applications to impersonate users in an organization in order to perform a task on behalf of them.

MS-OXWSATT\_User01, MS-OXWSBTRF\_User01, MSOXWSCORE\_User01, MSOXWSFOLD\_User01, and MSOXWSSYNC\_User01

1. Create the following managed folders in Active Directory:

MSOXWSFOLD\_ManagedFolder1 and MSOXWSFOLD\_ManagedFolder2

1. Create a public folder database.
2. Grant permissions to the mailbox user MSOXWSFOLD\_User01 to manage the public folders.
3. Create a public folder MSOXWSCORE\_PublicFolderMailbox.
4. Grant permissions to the mailbox user MSOXWSCORE\_User01 to manager the public folder MSOXWSCORE\_PublicFolder.

## Configuring the test suite client

The test suite client is managed through a common configuration file, two test suite-specific configuration files, and three SHOULD/MAY configuration files that all have a “.ptfconfig” extension. These configuration files can be modified directly. The common configuration file and the test suite-specific configuration files can also be modified through a script.

### Common configuration file

The common configuration file contains configurable properties common to all Exchange Server EWS Protocol test suites. This file must be modified to match the characteristics of the environment where the test suites are installed.

|  |  |
| --- | --- |
| **Configuration file** | **Description** |
| ExchangeCommonConfiguration.deployment.ptfconfig | The deployment configuration file provides the environmental details that are common to the test suites. |

### Test-suite specific configuration files

In addition to the common configuration file, each individual test suite has the following two configuration files for test suite-specific modification.

Test-suite specific configuration files

|  |  |
| --- | --- |
| Configuration file | Description |
| MS-XXXX\_TestSuite.deployment.ptfconfig | The deployment configuration file provides the environmental details that are specific to the test suite. The configuration file allows for the test suite-specific customization. |
| MS-XXXX\_TestSuite.ptfconfig | The test suite configuration file contains details that specify the behavior of the test suite operation. |

Both files are present in the TestSuite folder inside each test suite directory.

If you need to modify the common configuration values for a specific test suite, you must copy the common properties to the **MS-XXXX\_TestSuite.deployment.ptfconfig** file and change the values of the properties. The specific configuration file will take precedence over the common configuration file when the same property exists in both places.

#### Set the test suite to interactive mode

If the SUT is a non-Microsoft implementation of Exchange Server, it is recommended that you further configure the test suite by setting the test suite to interactive mode. Interactive mode enables the test suite to function in a manual way, enabling you to perform setup, teardown, and other tasks in a step-by-step approach. To enable interactive mode for a specific test suite, do the following:

1. Browse to the **MS-XXXX\_TestSuite.ptfconfig** configuration file within the **\Source\MS-XXXX\TestSuite\**.
2. Set the type value of Adapter property to **interactive** for the SUT control adapter\*\*.

Interactive mode values

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Default value\* | Optional value | Description |
| Adapter | managed or powershell | interactive\*\* | **managed**:  The SUT control adapter is implemented in C# managed code.  **powershell**:  The SUT control adapter is implemented through Windows PowerShell.  **interactive**:  Interactive adapters are used for manually configuring the server. Interactive adapter displays a dialog box to perform a manual test each time one of its methods is called. The dialog box will show the method name, parameter names, and values\*\*\* |

\**The Adapter property value is set to either managed or powershell depending on whether the SUT control adapter was implemented in managed C# code or through PowerShell.*

\*\* *When changing to interactive mode from managed mode, the “adaptertype” attribute must be deleted to avoid a runtime error. When changing to interactive mode from powershell mode, an additional step is required—delete the “scriptdir” attribute to avoid a runtime error.*

\*\*\**When the manual operation completes successfully, enter the return values (if any) in* ***Action Results*** *and click* ***Succeed*** *in the dialog box. When the manual operation is unable to complete, enter the error messages in the* ***Failure Message*** *text box and click* ***Fail*** *to terminate the test. In this case, the test will be treated as “Inconclusive”.*

Further customization can be done by creating your own SUT control adapter that matches the server implementation. For more information about how to create a SUT control adapter, see the Protocol Test Framework (PTF) user documentation.

#### Configure TSAP broadcast

Test Session Announcement Protocol (TSAP) is used by PTF to broadcast test information when the test suite is running. TSAP broadcasts helps in mapping test cases to captured frames.

By default, TSAP packets are broadcasted in the network. Users can change a TSAP broadcast by adding an entry “BeaconLogTargetServer” to TestSuite.deployment.ptfconfig to target the TSAP only to the specified machine.

To change the TSAP packet broadcast, do the following:

1. Browse to the **MS-XXXX\_TestSuite.deployment.ptfconfig** configuration file in the **\Source\MS-XXXX\TestSuite\** folder.
2. Add a property “BeaconLogTargetServer” along with the value of the specified machine name.

For example: <Property name="BeaconLogTargetServer" value="dc01" />

### SHOULD/MAY configuration files

The test suite has three SHOULD/MAY configuration files that are specific to all supported versions of the SUT. Each SHOULD/MAY requirement have an associated parameter with a value of either “true” or “false” corresponding to the server version that is supported. “true” represents that the requirement must be validated, whereas “false” means that the requirement must not be validated.

If the SUT is a non-Microsoft implementation of Exchange Server, configure the properties in the configuration file for the Exchange Server which is the closest match to the SUT implementation.

SHOULD/MAY configuration files

|  |  |
| --- | --- |
| Configuration file | Description |
| MS-XXXX\_ExchangeServer2007\_SHOULDMAY.deployment.ptfconfig | Provides the configuration properties for SHOULD and MAY requirements supported by Microsoft Exchange Server 2007 Service Pack 3 (SP3). |
| MS-XXXX\_ExchangeServer2010\_SHOULDMAY.deployment.ptfconfig | Provides the configuration properties for SHOULD and MAY requirements supported by Microsoft Exchange Server 2010 Service Pack 3 (SP3). |
| MS-XXXX\_ExchangeServer2013\_SHOULDMAY.deployment.ptfconfig | Provides the configuration properties for SHOULD and MAY requirements supported by Microsoft Exchange Server 2013 Service Pack 1 (SP1). |

### Configuring the test suite client using setup configuration script

**Note**  The setup configuration script is only implemented for configuring the test suite client on the Windows platform.

To configure the test suite using the setup configuration script, navigate to the **Setup\Test Suite Client**\ folder, right-click **ExchangeClientConfiguration.cmd** and select **Run as administrator**.

### Configuring the test suite client manually

If you didn’t use the setup configuration script to configure the test suite client as described in the previous section, follow the steps below to update configuration files and configure the test suite client.

1. Update the property value in the common configuration file and the test suite-specific configuration files according to the comment of the property.

# Running test suites

Once the required software has been installed and both the SUT and test suite client have been configured appropriately, the test suite is ready to run. The test suite can run only on the test suite client and can be initiated in one of the following two ways: Visual Studio or batch scripts.

## Microsoft Visual Studio

A Microsoft Visual Studio solution file **ExchangeServerEWSProtocolTestSuites.sln** is provided in the **Source** folder. You can run a single or multiple test cases in Visual Studio.

|  |  |
| --- | --- |
| 1. Open **ExchangeServerEWSProtocolTestSuites.sln** in Visual Studio. |  |
| 1. In the **Solution Explorer** pane, right-click **Solution ‘ExchangeServerEWSProtocolTestSuites’** and then click **Rebuild Solution**. |  |
| 1. Open **Test Explorer**. On the ribbon click **TEST**, then click **Windows**, and finally click **Test Explorer**. |  |
| 1. Select the test case to run. Right-click and then select **Run Selected Tests**. |  |

A Visual Studio solution file **MS-XXXX.sln** is provided in each test suite folder.

|  |  |
| --- | --- |
| 1. Select the test suite you would like to run. Let’s take MS-OXWSCORE as an example here, so browse to the **Source\MS-OXWSCORE** directory. | |
| 1. Open **MS-OXWSCORE.sln** in Microsoft Visual Studio. |  |
| 1. In the **Solution Explorer** pane, right-click **Solution ‘MS-OXWSCORE’**, and then click **Rebuild Solution**. |  |
| 1. Open **Test Explorer**. On the ribbon click **TEST**, thenclick **Windows**, and finally click **Test Explorer**. |  |
| 1. Select the test case to run. Right-click and then select **Run Selected Tests**. |  |

## Batch scripts

Exchange Server EWS Protocol test suites are installed with a collection of scripts that enable a user to run individual test cases (RunMSXXXX\_SXX\_TCXX\_Name.cmd) or all test cases in a test suite (RunAllMSXXXXTestCases.cmd), or all test cases of Exchange Server EWS Protocol test suites at once (RunAllExchangeEWSTestCases.cmd). These scripts can be found in the **\Source\Scripts** directory.

**Note**   These scripts depend on having the compiled binaries in the bin folder.

|  |  |
| --- | --- |
| **Batch script** | **Script description** |
| RunAllExchangeEWSTestCases.cmd | Runs all the test cases within the Exchange Server EWS Protocol test suites. |
| RunAllMSXXXXTestCases.cmd | Runs all MS-XXXX test cases. |
| RunMSXXXX\_SXX\_TCXX\_Name.cmd | Runs a specific test case within the test suite. |

# Test suite results, logs, and reporting

The test suites provide detailed reporting in a variety of formats that will enable users to quickly debug failures.

## Test suite configuration logs

The configuration logs contain information about whether each configuration step succeeds or not, and detail error information if the configuration step fails.

### SUT configuration logs

The SUT configuration scripts create a directory named **SetupLogs** under **…\Setup\SUT\** at runtime.The SUT configuration scripts save the logs as “ExchangeSUTConfiguration.ps1.debug.log” and “ExchangeSUTConfiguration.ps1.log”.

### Test suite client configuration logs

The configuration scripts create a directory named **SetupLogs** under **…\Setup\Test Suite Client\** at runtime.The test suite client configuration scripts save the logs as “ExchangeClientConfiguration.ps1.debug.log” and “ExchangeClientConfiguration.ps1.log”.

## Test suite reports

### Microsoft Visual Studio

Reports are created only after the package level solution or an individual test suite solution has run successfully in Visual Studio.

* Reporting information for **ExchangeServerEWSProtocolTestSuites.sln** is saved in **…\Source\TestResults**.
* Reporting information for an individual test suite **MS-XXXX.sln** is saved in **…\Source\MS-XXXX\TestResults**.

### Batch scripts

If the Exchange Server EWS Protocol test suites are run by the RunAllExchangeEWSTestCases.cmd batch file, the reporting information is saved in **…\Source\Scripts\TestResults**.

If the test suite is run by the batch file RunAllMSXXXXTestCases.cmd or RunMSXXXX\_SXX\_TCXX\_Name.cmd, the reporting information is saved in **…\Source\Scripts\MS-XXXX\TestResults.**

By default, a .trx file containing the pass/fail information of the run is created in the TestResults folder, along with an associated directory named **user\_MACHINENAME DateTimeStamp** that contains a log file in XML format and an HTML report.

# Appendix

For more information, see the following:

|  |  |
| --- | --- |
| References | Description |
| [dochelp@microsoft.com](mailto:dochelp@microsoft.com) | Alias for Interoperability documentation help. Provides support for the Open Specifications and protocol test suites. |
| [Open Specifications Forums](http://go.microsoft.com/fwlink/?LinkId=111125) | Microsoft Customer Support Services forums. Actively monitored forums provide support for the Open Specifications and protocol test suites. |
| [Open Specifications Developer Center](http://go.microsoft.com/fwlink/?LinkId=254469) | Open Specifications home page on MSDN |
| [Open Specifications](http://go.microsoft.com/fwlink/?LinkId=179743) | Open Specifications documentation on MSDN |
| [Exchange Products and Technologies Protocols](http://go.microsoft.com/fwlink/?LinkId=119904) | Exchange Server Open Specifications documentation on MSDN |
| [RFC2119](http://go.microsoft.com/fwlink/?LinkId=117453) | Normative language reference |
| [Exchange Server 2013 deployment](http://go.microsoft.com/fwlink/?LinkID=266569) | Exchange Server 2013 planning and deployment on TechNet |
| [Exchange Server 2010 deployment](http://go.microsoft.com/fwlink/?LinkID=517397) | Exchange Server 2010 planning and deployment on TechNet |
| [Exchange Server 2007 deployment](http://go.microsoft.com/fwlink/?LinkID=512508) | Exchange Server 2007 deployment on TechNet |