

# Microsoft© Lync Server 2010

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## Scale to a Load Balanced Enterprise Edition Pool with WebMux Walkthrough

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**Note:**

In order to find topics that are referenced by this document but not contained within it, search for the topic title in the TechNet library at <http://technet.microsoft.com/en-us/library/gg398616.aspx>.

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# Load Balanced Enterprise Edition Lync Server 2010

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Microsoft© Lync Server 2010 supports both DNS load balanced and hardware load balanced solutions. While DNS load balancing can be used to distribute SIP traffic equally among the various Front End servers in a Front End pool, a hardware load balancer must be used to handle HTTP connections to Lync Web Services. Please note that a hardware load balancer is not required when a Lync Server 2010 Standard Edition or a single Lync Server 2010 Enterprise Edition Front End Server is deployed within a Lync environment.

Additionally, Microsoft© Lync Server 2010 supports backend server. Microsoft© SQL server runs on those backend server to provide the database access for the Front End servers.

**Note:**

This procedure assumes that the starting point is an enterprise edition Front End server without a load balancer.

# Overview of Scaling an Enterprise Pool

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## Overview

Each Front End pool can have more than one Front End Server. Each Front End server can handle up to 10,000 users. However, to provide reliability and ability to easy maintenance, more than one Front end server is needed. Those front end servers are load balanced by the WebMux hardware load balancer. The WebMux load balancer requirements for Lync Server 2010 are different than the requirements for Office Communications Server 2007 or Office Communications Server 2007 R2, especially for connections to Lync Web Services. While source address affinity persistence is recommended for connections to Lync Web Services from internal clients, cookie-based persistence is required for connections to Lync Web Services from external clients.

If you have Front End pools, Director pools, Edge Server pools, or reverse proxy pools, you need to deploy load balancing for these pools. WebMux load balancer distributes the traffic among the servers in a pool, also called FARM.

## Supported Topologies for Load Balanced Enterprise Pools

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### Supported Topologies

WebMux supports four different topologies, Single Network mode, Out-of-Path mode, two arms NAT mode and two arms Transparent mode. Your networking team may have an existing best practice for deploying load balanced services, and that will probably have the biggest impact on which option that you will use. If no precedent exists, here are some factors to consider when deciding between a one-armed or two-armed topology. 1). One armed topology has least impact on the network configuration. Two armed topology could have better isolation to the servers. 2). In one armed topology, servers will not get client IP address in its log, server software must have other ways to obtain that information, for example, turn on MIME header X-FORWARD-FOR flag on the WebMux configuration and filtering it in the server software. Two arm topology will always keep the client source IP address in the IP header.

For the purposes of this document, we shall define one sample topology to illustrate specific steps that would be involved in moving to a load-balanced Enterprise pool. They are shown in the figures below. It shows a one-armed topology.

Please note: Microsoft's requirement to have SNAT(FULL NAT) for Lync 2010 server can be satisfied by enable SNAT on the per farm basis configuration, even in NAT mode.

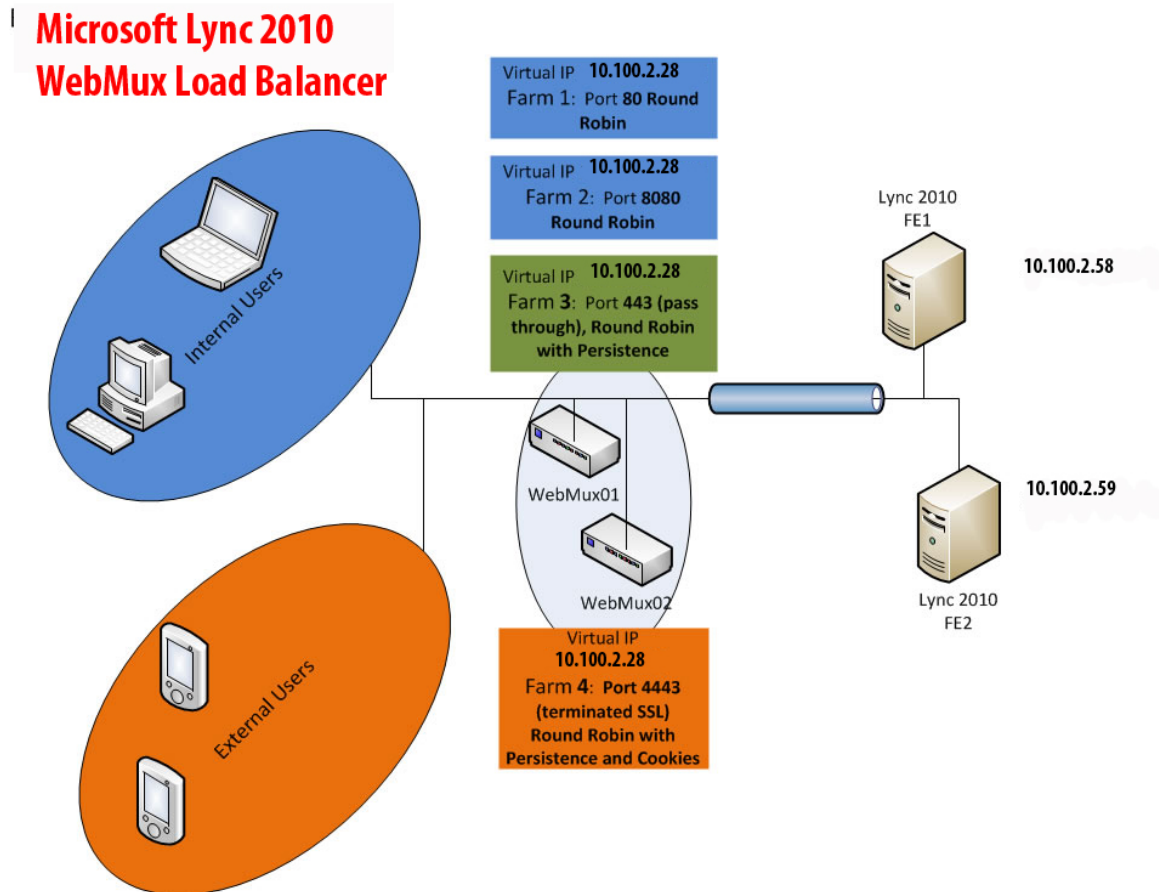


Figure above: One-Armed topology Example

The user traffic divided between internal users and external users. Internal users are using farm1, farm2, and farm3. External users will use farm4. All four farms on the same farm IP address, but on different ports. You may also need to have more ports than listed in Figure above for additional services.

# Walkthrough: Setting Up Front End Servers

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## Setting Up Front End Servers

To install Microsoft Lync Server 2010 Front End pool, please follow the following steps:

1. Install the local Configuration Store.
2. Install Front End Servers.
3. Delegate Setup Permissions.
4. Configure Certificates for Front End Servers.
5. Start Services on Front End Servers.
6. Test the Pool Deployment.

## Walkthrough: Install the Local Configuration Store

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1. From the installation media, browse to `\setup\amd64\Setup.exe`, and then click **OK**.
2. If you are prompted to install the Microsoft Visual C++ 2008 redistributable, click **Yes**.
3. On the **Lync Server 2010 Installation Location** page, click **OK**.
4. On the **End User License Agreement** page, review the license terms, select **I accept the terms in the license agreement**, and then click **OK**. This step is required before you can continue.
5. On the Deployment Wizard page, click **Install or Update Lync Server System**.
6. On the **Lync Server 2010** page, next to **Step1: Install Local Configuration Store**, click **Run**.
7. On the **Local Server Configuration** page, ensure that the **Retrieve configuration automatically from the Central Management Store** option is selected, and then click **Next**.
8. When the local server configuration installation is complete, click **Finish**.



## Walkthrough: Install Front End Server

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1. If the Lync Server Deployment Wizard is not running, start it on the Front End Server that you are setting up.
2. In the Deployment Wizard, verify that **Step 1: Install Local Configuration Store** has a green check mark, which means that the step has been completed. If it is not complete, install the Local Configuration store on the Front End Server. For details, see [Install the Local Configuration Store](#).
3. To install the Lync Server 2010 components for the Front End Server, click **Run** next to **Step 2: Setup or Remove Lync Server Components**.
4. On the **Setup Lync Server Components** page, click **Next** to set up components as defined in the published topology.
5. The **Executing Commands** page displays a summary of commands and installation information as it proceeds. When finished, you can use the list to select a log to view, and then click **View Log**.
6. When Lync Server components setup completes, click **Finish**.

## Walkthrough: Delegate Setup Permissions

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1. Log on to a server as a member of the Domain Admins group for the domain on which the delegated user will run **Enable-CsTopology**.
2. Open the Lync Server Management Shell. The Lync Server Management Shell is automatically installed on each Front End Server or any computer where the Lync Server 2010 administrative tools have been installed. For details about the Lync Server Management Shell, see [Lync Server Management Shell](#) in the Operations documentation.
3. Run the following cmdlet from the Lync Server Management Shell:

```
Grant-CsSetupPermission -ComputerOU <DN of the OU> -Domain <Domain FQDN>
```

In the following example, the OU is Lync Servers, which is in the contoso.com domain.

```
Grant-CsSetupPermission -ComputerOU "OU=Lync Servers" -Domain contoso.com
```

# Walkthrough: Configure Certificates for Front End Servers

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Please reference to Microsoft Web site:

<http://technet.microsoft.com/en-us/library/gg398995.aspx>

# Walkthrough: Start Services on Front End Servers

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1. In the Lync Server Deployment Wizard, on the **Lync Server 2010** page, click **Run** next to **Step 4: Start Services**.
2. On the **Start Services** page, click **Next** to start the Lync Server services on the server.
3. On the **Executing Commands** page, after all services have started successfully, click **Finish**.

**Important:**

The command to start the services on the server is a best effort method to report that the services have in fact started. It might not reflect the actual state of the service. We recommend that you use the step **Service Status (Optional)** immediately following **Start Services** to open the Microsoft Management Console (MMC) and confirm that the services have started successfully. If any Lync Server service has not started, you can right-click that service in the MMC, and then click **Start**.

# Walkthrough: Installing and Configuring WebMux Load Balancers

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## Installing and Configuring WebMux load balancers

Now that the Front End Servers are functioning correctly, you can install and configure your load balancer. First, confirm that your load balancer meets the requirements for Lync 2010 Servers, which are described in Load Balancers for Lync 2010 planning guide in the Technical Reference on Microsoft web site. WebMux with firmware version 9.0.02 and higher does meet the Microsoft Lync 2010 and Exchange 2010 requirements.

In our example, we use port 80, 8080, and port 443 for Internal users and port 4443 for external users. In some other configuration, customer could also have port 5061, port 135, port 444.

steps are required no matter which model is used:

### Connect Load Balancer and Confirm Networking

WebMux should have its own IP address on the network in Single Network mode. We use 10.100.2.2 as WebMux01, 10.100.2.3 as WebMux02. In this example, we also decide 10.100.2.28 as the farm address. This configuration is done by using LCD keypad to select Single Network mode and specify the WebMux IP address, netmask, and default gateway.

### Configure load balancer with Front End Pool Servers

Once configured WebMux Networking parameters, use IE browser to connect to WebMux:

<http://10.100.2.2:24/cgi-bin/login> to login as superuser, default password is superuser.

From WebMux GUI, select Add Farm to add farm for port 80 Select HTTP as farm protocol. Then Add Farm for port 443, select HTTPS as protocol. Next Add Farm for port 8080, select TCP protocol, using generic TCP healthcheck. In the above farms, port 443 farm uses weighted round robin persistent load balancing method. The farms on port 80 and 8080 using weighted round robin with no persistent.

webmux.cainetworks.com  
CPU: 0%, mem: 3%  
single network mode  
IP 10.100.2.2 MAC 00:22:12:f0:03:b1  
Apr 5 14:16:26 2012 up since Apr 5 12:59:09 2012

		main	network	security	miscellaneous
add farm	type	service	IP address	port	status conn conn/s pkt/s
modify farm	+	WRR farm	http	10.100.2.28	80 2 servers ALIVE 0 0 0
delete farm	+	WRR farm	https	10.100.2.28	443 2 servers ALIVE 0 0 0
add server	+	WRR farm	tcp	10.100.2.28	8080 2 servers ALIVE 0 0 0
modify server	<input type="button" value="save"/> <input type="button" value="pause"/>				
delete server	© 1997-2012 CAI Networks. All rights reserved.				
add MAP					
modify MAP					
delete MAP					
modify health check					
help					

Next create a farm for the 4443 port. This port is for traffic from outside of your firewall. This farm require to have WebMux SSL terminated and re-encrypted. WebMux performs SSL termination by sending decrypted HTTPS traffic into clear HTTP traffic on a different port. If the port is not specified, WebMux will automatically use port 80. However, in our example, port 80

has been used by other Lync related logic already. So we MUST pick a port number not being used by anything else. For example, we select unused port 980 for this farm, however, if port 980 is used for anything, please change it to another unused port number.

Add farm with port 980, select HTTP protocol, in scheduling method field using Layer 7 cookie load directing with cookies. Set the SSL Termination field to use the desired key and certificate. Set the SSL port field to 4443. This is important, since if that is not specified, WebMux will pick default HTTPS port 443, which is being used already. Set “block non-SSL access to farm” to Yes to prevent any connection to the port 980. Set the “servers are HTTPS servers, not HTTP servers” to Yes to enable SSL re-encryption.

webmux.cainetworks.com  
CPU: 0%, mem: 3%  
single network mode  
IP 10.100.2.2 MAC 00:22:12:f0:03:b1  
Apr 5 14:19:07 2012 up since Apr 5 12:59:08 2012

CAI NETWORKS  
WebMux

main network security miscellaneous

add gateway farm  
help

**add farm**

If the port number is omitted and the service pertains to a particular application level protocol, the well-known port for this protocol will be used, for example port 80 for HTTP. If the port number is omitted and no such protocol pertains to the service, for example the generic TCP service, the farm will handle all ports for the IP address and transport layer protocol in question except those handled specifically by other farms.

IP address	10 . 100 2 . 28
label	
port number	980
service	HTTP -- hypertext transfer protocol (TCP)
scheduling method	layer 7 HTTP cookie load directing with cookies
SSL termination	2 sample 2048-bit private key
SSL port	4443
block non-SSL access to farm	YES
tag SSL-terminated HTTP requests	NO
servers are HTTPS servers, reencryption	YES
servers only serve IPv4, not IPv6	NO
connection throttling watermarks	low: high:
HTTP server response comparison string	
HTTP server URI	

submit cancel

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From web GUI, click on each of the farm line IP address to add servers. If servers are identical, specify weight as 1 for all the servers. Once servers added, WebMux will start healthcheck on each of them. Please make sure the servers are in good healthy state.

Microsoft© Lync and Exchange servers require a cookie being inserted for them to use. Please note this is not a cookie for load balancing, rather is the cookie required by Microsoft© software so that their clients and servers can perform Web Services Management. To be able to meet this requirement by Microsoft©, please follow the steps below in Main->Healthcheck->Layer\_7\_check to configure it:

The screenshot shows the CAI Networks WebMux configuration interface. At the top right, system information is displayed: webmux.cainetworks.com, CPU: 0%, mem: 3%, single network mode, IP 10.100.2.2, MAC 00:22:12:10:03:b1, and Apr 5 14:22:00 2012 up since Apr 5 12:59:08 2012. The interface has a navigation menu on the left with options: modify timeouts, custom check, HTTP check, layer 7 check (selected), and help. The main content area is titled 'layer 7 check management' and includes the instruction: 'Please enter values for layer 7 HTTP checks. The items with \* take effect on next restart.' Below this, there are three configuration fields: '\* cookie name' with the value 'MS\_WSMAN', '\* use session cookies' with a dropdown set to 'YES', and '\* web service management cookie' with a dropdown set to 'YES'. At the bottom of the form are 'submit' and 'cancel' buttons, and a copyright notice: '© 1997-2012 CAI Networks. All rights reserved.'

Due to many mobile devices are not fully compliance to the HTTP protocol between different Aps, internal logic can not base on cookie based load balancing. Thus the connection counts may show not evenly distributed between servers with small number of users. However, when large enough number of users on the site, WebMux will distribute the traffic evenly between servers.

It is very important that all of the requirements and configurations listed above be completed correctly. You will need to change DNS configuraiton to have the FE pool FQDN points to the farm IP address now 10.100.2.28. When you are finished, you will validate the load balancer configuration.

## Walkthrough: Testing Configuration

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Congratulations! You just finished configuration of WebMux load balancing Microsoft© Lync Sever 2010. Please test with internal users and external users to make sure all the planed features are working.