Microsoft Lync Server 2010 on Dell Systems

Solutions for 500 to 25,000 Users
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1 Introduction

1.1 Overview
This Microsoft® Lync Server 2010 solution architecture manual contains possible configurations that can be used to architect your Lync 2010 infrastructure. Samples in the manual are intended to serve as a blueprint or example for organizations whose requirements are similar. Each organization’s requirements can differ significantly, though, and include items not accounted for in these configurations. For a configuration sized to your specific requirements, please contact your Dell representative or visit Dell.com/Unified.

1.2 Hardware
Sample solutions described in this manual use the following Dell equipment:
- PowerEdge™ M1000e
- PowerEdge R610
- PowerEdge R710
- PowerEdge M610
- EqualLogic™ PS6000X
- EqualLogic PS6000XV
Click on the links to the product landing pages for additional information on each product.

1.3 Virtualization
Those configurations that employ hardware virtualization software assume a platform approved through Microsoft’s Server Virtualization Validation Program and deployed consistent with Microsoft’s support guidelines for running Microsoft Lync Server 2010 on a virtualization platform.

1.4 Disclaimer
These sizing recommendations are based on Microsoft’s Planning Tool for Lync 2010 combined with extensive sizing work done on Dell servers and storage and Microsoft® Office Communications Server 2007 R2. Each deployment’s workload may differ in specific requirements that govern sizing and architecture.
2 500 Users

2.1 Solution Requirements

<table>
<thead>
<tr>
<th>Number of users</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Availability</td>
<td>No</td>
</tr>
<tr>
<td>Virtualization</td>
<td>No</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>1</td>
</tr>
<tr>
<td>Not included in this solution</td>
<td>Edge services, Exchange servers (including UM)</td>
</tr>
</tbody>
</table>

2.2 Recommended Solution

<table>
<thead>
<tr>
<th>Server Configurations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Lync Server Version</td>
<td>Standard Edition</td>
</tr>
<tr>
<td>Front End, Mediation and A/V Conferencing Servers</td>
<td>1x PowerEdge R710, 2x quad-core processors and 16GB of RAM</td>
</tr>
<tr>
<td>Back End Server</td>
<td>1x PowerEdge R710, 2x dual-core processors and 12GB of RAM</td>
</tr>
<tr>
<td>Archiving/Monitoring Server</td>
<td>1x PowerEdge R710, 2x dual-core processors and 8GB of RAM</td>
</tr>
<tr>
<td>Storage Configuration</td>
<td>Storage for Front-End</td>
</tr>
<tr>
<td></td>
<td>Storage for Archiving/Monitoring and Back End Servers</td>
</tr>
<tr>
<td>Network/VoIP Configuration</td>
<td>Audio Bandwidth (low- and high-quality range)</td>
</tr>
<tr>
<td></td>
<td>Data Bandwidth</td>
</tr>
<tr>
<td></td>
<td>Media Gateway (can be SIP trunk)</td>
</tr>
<tr>
<td></td>
<td>Bandwidth between Mediation Server and Gateway</td>
</tr>
</tbody>
</table>
2.3 Architecture Diagram
3 1,000 Users

3.1 Solution Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
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<tbody>
<tr>
<td>Number of users</td>
<td>1,000</td>
</tr>
<tr>
<td>High Availability</td>
<td>Yes (except for Archiving/Monitoring Server)</td>
</tr>
<tr>
<td>Virtualization</td>
<td>Partially virtualized</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>1</td>
</tr>
<tr>
<td>Not included in this solution</td>
<td>Edge services</td>
</tr>
</tbody>
</table>

3.2 Recommended Solution

<table>
<thead>
<tr>
<th>Server Configurations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft Lync Server Version</strong></td>
<td>Enterprise Edition</td>
</tr>
<tr>
<td><strong>Virtualization Servers</strong></td>
<td>2x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x six-core processors and 32GB of RAM</td>
</tr>
<tr>
<td><strong>Front End, Mediation and A/V Conferencing VM’s</strong></td>
<td>2x VMs each with 4 vCPUs and 16GB RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Lync Server Directors</strong></td>
<td>2x VMs each with 2 vCPUs and 8GB of RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Archiving/Monitoring Server</strong></td>
<td>1x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x dual-core processors and 12GB of RAM</td>
</tr>
<tr>
<td><strong>Back End Server</strong></td>
<td>2x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 24GB of RAM</td>
</tr>
<tr>
<td><strong>Storage Configuration</strong></td>
<td>Detail</td>
</tr>
<tr>
<td><strong>Storage Hardware</strong></td>
<td>1x Dell EqualLogic PS6000X</td>
</tr>
<tr>
<td><strong>Drives</strong></td>
<td>16x 400GB 3.5” 10K SAS</td>
</tr>
<tr>
<td><strong>RAID</strong></td>
<td>RAID 10</td>
</tr>
<tr>
<td><strong>Network/VoIP Configuration</strong></td>
<td>Detail</td>
</tr>
<tr>
<td><strong>Audio Bandwidth (low- and high-quality range)</strong></td>
<td>2.97 to 4.77 Mbps</td>
</tr>
<tr>
<td><strong>Daa Bandwidth</strong></td>
<td>5.47 Mbps</td>
</tr>
<tr>
<td><strong>Media Gateway (can be SIP trunk)</strong></td>
<td>12 ports/VoIP channels; 1x T1 Lines</td>
</tr>
<tr>
<td><strong>Bandwidth between Mediation Server and Gateway</strong></td>
<td>0.32Mbps to 0.77Mbps</td>
</tr>
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3.3 Architecture Diagram
# 4 5,000 Users

## 4.1 Solution Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Number of users</td>
<td>5,000</td>
</tr>
<tr>
<td>High Availability</td>
<td>Yes</td>
</tr>
<tr>
<td>Virtualization</td>
<td>Partially virtualized</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>2</td>
</tr>
<tr>
<td>Not included in this solution</td>
<td>Edge services</td>
</tr>
<tr>
<td></td>
<td>Exchange servers (including UM)</td>
</tr>
</tbody>
</table>

## 4.2 Recommended Solution (per Site)

<table>
<thead>
<tr>
<th>Server Configurations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Lync Server Version</td>
<td>Enterprise Edition</td>
</tr>
<tr>
<td>Virtualization Servers</td>
<td>2x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x six-core processors and 32GB of RAM</td>
</tr>
<tr>
<td>Front End, Mediation and A/V Conferencing VM’s</td>
<td>2x VMs each with 4 vCPUs and 16GB RAM (1x VM per host)</td>
</tr>
<tr>
<td>Lync Server Directors</td>
<td>2x VMs each with 2 vCPUs and 8GB of RAM (1x VM per host)</td>
</tr>
<tr>
<td>Archiving/Monitoring Server</td>
<td>2x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x dual-core processors and 12GB of RAM</td>
</tr>
<tr>
<td>Back End Server</td>
<td>2x PowerEdge R710</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 24GB of RAM</td>
</tr>
<tr>
<td>Storage Configuration</td>
<td>Detail</td>
</tr>
<tr>
<td>Storage Hardware</td>
<td>1x Dell EqualLogic PS6000X</td>
</tr>
<tr>
<td>Drives</td>
<td>16x 400GB 3.5” 10K SAS</td>
</tr>
<tr>
<td>RAID</td>
<td>RAID 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network/VoIP Configuration</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio Bandwidth (low- and high-quality range)</td>
<td>7.42Mbps to 11.93Mbps</td>
</tr>
<tr>
<td>Data Bandwidth</td>
<td>13.67Mbps</td>
</tr>
<tr>
<td>Media Gateway (can be SIP trunk)</td>
<td>20 ports/VoIP channels; 1x T1 Lines</td>
</tr>
<tr>
<td>Bandwidth between Mediation Server and Gateway</td>
<td>0.53Mbps to 1.28Mbps</td>
</tr>
</tbody>
</table>
4.3 Architecture Diagram

Enterprise Edition Server, Mediation Server, Lync Server Director and audio/video conferencing Virtual Machines with high availability

Front End + Mediation + audio/video conferencing VM | Lync Server VM | Front End + Mediation + audio/video conferencing VM | Lync Server VM

Dell PowerEdge R710 | Dell PowerEdge R710

Dell PowerConnect 6224

To active directory/DNS

Back end high availability

Back end role | Back end role

Dell PowerEdge R710 | Dell PowerEdge R710

ISCSI Network

Dell EqualLogic PS6000X

Archiving/Monitoring high availability

Archiving role collocated with monitoring role | Archiving role collocated with monitoring role

Dell PowerEdge R710 | Dell PowerEdge R710
5 10,000 Users

5.1 Solution Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
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</thead>
<tbody>
<tr>
<td>Number of users</td>
<td>10,000</td>
</tr>
<tr>
<td>High Availability</td>
<td>Yes (except for Archiving/Monitoring Server)</td>
</tr>
<tr>
<td>Virtualization</td>
<td>Partially virtualized</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>1</td>
</tr>
<tr>
<td>Number of Branch Offices</td>
<td>2 (500 users each)</td>
</tr>
<tr>
<td>Not included in this solution</td>
<td>Edge services</td>
</tr>
<tr>
<td></td>
<td>Exchange servers (including UM)</td>
</tr>
</tbody>
</table>

5.2 Recommended Solution

<table>
<thead>
<tr>
<th>Server Configurations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft Lync Server Version</strong></td>
<td>Enterprise Edition</td>
</tr>
<tr>
<td><strong>Virtualization Servers</strong></td>
<td>3x PowerEdge R610</td>
</tr>
<tr>
<td></td>
<td>2x six-core processors and 48GB of RAM</td>
</tr>
<tr>
<td><strong>Front End, Mediation Server VM’s</strong></td>
<td>3x VMs each with 4 vCPUs and 16GB RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Audio/Video Conferencing Server VM’s</strong></td>
<td>3x VMs each with 4 vCPUs and 16GB RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Lync Server Directors</strong></td>
<td>3x VMs each with 2 vCPUs and 8GB of RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Archiving/Monitoring Server</strong></td>
<td>2x PowerEdge R610</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 16GB of RAM</td>
</tr>
<tr>
<td><strong>Back End Server</strong></td>
<td>2x PowerEdge R610</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 32GB of RAM</td>
</tr>
<tr>
<td><strong>Survivable Branch Appliance</strong></td>
<td>2 (1 per branch office)</td>
</tr>
<tr>
<td><strong>Storage Configuration</strong></td>
<td><strong>Detail</strong></td>
</tr>
<tr>
<td><strong>Storage Hardware</strong></td>
<td>2x Dell EqualLogic PS6000XV</td>
</tr>
<tr>
<td><strong>Drives</strong></td>
<td>32x 400GB 3.5” 15K SAS</td>
</tr>
<tr>
<td><strong>RAID</strong></td>
<td>RAID 10</td>
</tr>
<tr>
<td><strong>Network/VoIP Configuration</strong></td>
<td><strong>Detail</strong></td>
</tr>
<tr>
<td><strong>Audio Bandwidth (low- and high-quality range)</strong></td>
<td>29.69 to 47.71 Mbps</td>
</tr>
<tr>
<td><strong>Data Bandwidth</strong></td>
<td>54.67 Mbps</td>
</tr>
<tr>
<td><strong>Media Gateway (can be SIP trunk)</strong></td>
<td>56 ports/VoIP channels, 3x T1 Lines</td>
</tr>
<tr>
<td><strong>Bandwidth between Mediation Server and Gateway</strong></td>
<td>1.48Mbps to 3.58Mbps</td>
</tr>
</tbody>
</table>
5.3 Architecture Diagram

Enterprise Edition Server, Mediation Server, Lync Server Director and audio/video conferencing Virtual Machines with high availability

Audio/Video Conferencing VM
Front End + Mediation VM
Lync Server Director VM

Dell PowerEdge R610

branch Office - 1
Survivable Branch Appliance - 1
Survivable Branch Appliance - 2
branch Office - 2

To active directory/DNS

Dell PowerConnect 6224

Back end high availability

Back end role
Back end role

Dell PowerEdge R610
Dell PowerEdge R610

ISCSI Network

Dell EqualLogic PS6000X
dell EqualLogic PS6000X

Archiving/Monitoring high availability

Archiving role collocated with monitoring role
Archiving role collocated with monitoring role

Dell PowerEdge R610
Dell PowerEdge R610
6 25,000 Users

6.1 Solution Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
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<tbody>
<tr>
<td>Number of users</td>
<td>25,000</td>
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<tr>
<td>High Availability</td>
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</tr>
<tr>
<td>Virtualization</td>
<td>Partially virtualized</td>
</tr>
<tr>
<td>Number of Sites</td>
<td>2</td>
</tr>
<tr>
<td>Number of Branch Offices</td>
<td>2 (500 users each)</td>
</tr>
<tr>
<td>Not included in this solution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Edge services</td>
</tr>
<tr>
<td></td>
<td>Exchange servers (including UM)</td>
</tr>
<tr>
<td></td>
<td>Site Failover</td>
</tr>
</tbody>
</table>

6.2 Recommended Solution (per Site)

<table>
<thead>
<tr>
<th>Server Configurations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft Lync Server Version</strong></td>
<td>Enterprise Edition</td>
</tr>
<tr>
<td><strong>Virtualization Servers</strong></td>
<td>3x PowerEdge M610</td>
</tr>
<tr>
<td></td>
<td>2x six-core processors and 48GB of RAM</td>
</tr>
<tr>
<td><strong>Front End, Mediation Server VMs</strong></td>
<td>3x VMs each with 4 vCPUs and 24GB RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Audio/Video Conferencing Server VMs</strong></td>
<td>3x VMs each with 4 vCPUs and 16GB RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Lync Server Director VMs</strong></td>
<td>3x VMs each with 2 vCPUs and 8GB of RAM</td>
</tr>
<tr>
<td></td>
<td>(1x VM per host)</td>
</tr>
<tr>
<td><strong>Archiving/Monitoring Server</strong></td>
<td>2x PowerEdge M610</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 12GB of RAM</td>
</tr>
<tr>
<td><strong>Back End Server</strong></td>
<td>2x PowerEdge M610</td>
</tr>
<tr>
<td></td>
<td>2x quad-core processors and 24GB of RAM</td>
</tr>
<tr>
<td><strong>Survivable Branch Appliance</strong></td>
<td>2 (1 per branch office)</td>
</tr>
<tr>
<td><strong>Storage Configuration</strong></td>
<td><strong>Detail</strong></td>
</tr>
<tr>
<td><strong>Storage Hardware</strong></td>
<td>2x Dell EqualLogic PS6000XV</td>
</tr>
<tr>
<td><strong>Drives</strong></td>
<td>32x 600GB 3.5” 15K SAS</td>
</tr>
<tr>
<td><strong>RAID</strong></td>
<td>RAID 10</td>
</tr>
<tr>
<td><strong>Network/VoIP Configuration</strong></td>
<td><strong>Detail</strong></td>
</tr>
<tr>
<td><strong>Audio Bandwidth (low- and high-quality range)</strong></td>
<td>35.63Mbps to 57.26Mbps</td>
</tr>
<tr>
<td><strong>Data Bandwidth</strong></td>
<td>65.61Mbps</td>
</tr>
<tr>
<td><strong>Media Gateway (can be SIP trunk)</strong></td>
<td>68 ports/VoIP channels; 3x T1 lines</td>
</tr>
<tr>
<td><strong>Bandwidth between Mediation Server and Gateway</strong></td>
<td>1.8Mbps to 4.35Mbps</td>
</tr>
</tbody>
</table>
6.3 Architecture Diagram