Dell PowerEdge VRTX Networking Deployment Guide: for Microsoft Lync and Dell Mobility

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Executive Summary

Dell PowerEdge VRTX is a new shared infrastructure product focused on remote, branch, and small office needs. It combines Dell PowerEdge M520 and M620 server blades, shared storage, and IO in the form of PCIe and one IOM slot. These elements are combined into a 5U rackable tower, providing a simpler model for Remote Office/Branch Office (ROBO) and Small and Medium Business (SMB) customers to deploy and manage. The Dell 1GbE switch I/O Module (IOM) includes eight external Gigabit Ethernet ports providing network connectivity to the Dell PowerEdge Blade servers within the Dell PowerEdge VRTX chassis.

Introduction

This deployment guide outlines the steps of connecting the VRTX to a SMB network including integration options for Dell W-Series WLAN Mobility controller. Dell PowerEdge VRTX is designed to empower ROBO’s and SMB’s with the connectivity, along with its optimized storage and compute power to deliver an end-to-end solution optimized for providing for time sensitive applications like Microsoft Lync.

ROBO’s can now take advantage of running media collaborative applications like Microsoft Lync providing voice, video, and instant messaging (IM). With the flexibility of Dell’s PowerEdge VRTX chassis, a virtualized Microsoft Lync Server can be hosted right on premise.
Networking for Dell PowerEdge VRTX Chassis

Dell PowerEdge VRTX can be configured with an integrated 1Gb pass-through switch module or an integrated 1GbE switch module, simplifying network connectivity and reducing costs for small business budgets. The 1GbE switch module is recommended for most applications. The diagrams below show the physical architecture and some representative logical network topologies for small and intermediate office deployments.

Figure 1. Dell PowerEdge VRTX Chassis
Deployment Scenarios

Figure 2. Small Office Deployment

Small Office Deployment Components

<table>
<thead>
<tr>
<th>Number of Users</th>
<th>1-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis Platform</td>
<td>Dell PowerEdge VRTX</td>
</tr>
<tr>
<td>Servers</td>
<td>Dell PowerEdge M520 or M620 Blade installed in slots 1-4</td>
</tr>
<tr>
<td>Operating System</td>
<td>1x Windows 2012 Server</td>
</tr>
<tr>
<td>Network</td>
<td>Integrated 1Gbe switch module with 8 external RJ45 ports</td>
</tr>
</tbody>
</table>
## Intermediate Office Deployment Components

<table>
<thead>
<tr>
<th>Number of Users</th>
<th>25-50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chassis Platform</strong></td>
<td>Dell PowerEdge VRTX</td>
</tr>
<tr>
<td><strong>Servers</strong></td>
<td>Dell PowerEdge M520 or M620 Blade installed in slots 1-4</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>1x Windows 2012 Server</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>1x Microsoft Lync Standard Edition Server</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>Integrated 1GbE switch module with 8 external RJ45 ports, 1x Dell Networking 5524P</td>
</tr>
<tr>
<td><strong>Wireless Network</strong></td>
<td>Access Point - Dell Networking W-AP105, Mobility Controller - 1x Dell Networking W-620</td>
</tr>
</tbody>
</table>

**NOTE:** Each Remote Office/Branch Office may have unique RF environments. A wireless Site Survey is highly recommended to ensure best results.
Initial CMC Network Configuration

By default, the Chassis Management Controller (CMC) is set to obtain IP address from an external DHCP server. By connecting the CMC network cable to the network, an IP address will be assigned to the CMC. This can be verified by using the VRTX LCD configuration wizard.

From the LCD panel on the front of the chassis, select IP summary from the main menu screen. (Use up and down arrow button to navigate pressing the center button to select) The CMC IP address is displayed along with iDRAC1 and iDRAC2.

For a detailed description on configuring the CMC settings, please see the Dell PowerEdge VRTX User’s Guide Dell PowerEdge VRTX User’s Guide

Logging into Chassis Management Controller (CMC) Using WEB Interface

Open a WEB browser, in the address field, enter the CMC IP address. Figure 4 shows the Login screen to the Dell PowerEdge VRTX Chassis Management Controller. Enter the default Username: root and Password: calvin, and click Submit.

⚠️ NOTE: Dell recommends customers set unique username and password.

Figure 4. CMC Login
Initial Blade Server Status

Figure 5 shows two M-Series blade servers. Note the Power state field.

**Figure 5. Chassis Server Overview**

In figure 6, enable the Blade Server slot.

**NOTE:** Each Dell PowerEdge M-Series blade server can be powered on by pressing the power button on the front bezel.

**Figure 6. Powering On Blade Server**
Accessing Blade Servers

In figure 7, under Server Overview, highlight the Dell PowerEdge blade server slot then click Launch iDRAC GUI to open Integrated Dell Remote Access Controller.

Figure 7. Launch iDRAC GUI

Figure 8 shows the Integrated Dell Remote Access Controller System Summary page. Under Virtual Console Preview, click Launch.

Figure 8. Accessing blade server
Figure 9. Opening Viewer

![Opening viewer.jnlp(172.25.106.232@0@idrac-BGCFQY1,+PowerE...)](image)

You have chosen to open:

```
...3854233@ST1=2a78a7b3c53db32def94004044444d01
```

which is a JNLP File (3.6 KB)

from: https://172.25.106.232

What should Firefox do with this file?

- Open with Java(TM) Web Start Launcher (default)
- Save File

- Do this automatically for files like this from now on.

[OK] [Cancel]

Figure 10. Starting Application

![Starting application...](image)

Verifying application.

Name: iDRAC7 Virtual Console Client

Publisher: Dell Inc.

Location: https://172.25.106.232:443/software/avctKVM.jar

[Cancel]
Figure 11 shows the Integrated Dell Remote Access Controller connection to the Dell PowerEdge M-Series blade server. Network connectivity to the blade server can be setup.

Figure 11. Blade server Access
Accessing the VRTX 1GbE Switch Module

Figure 12 shows the I/O Module Overview. **Launch IOM GUI.**

**NOTE:** By default, the 1GbE switch module obtains its IP address from the local DHCP server. However, users can assign a static IP address by selecting the <Setup> entry from the I/O Module Overview page.

Logging into the VRTX 1GbE Switch Module
Figure 13 shows the Login screen to the VRTX 1GbE Switch Module. Enter the default Username: root and Password: calvin, and click Submit.

*NOTE:* Dell recommends customers set unique username and password.

**Figure 13. 1GbE Switch Module Login**

![VRTX 1GbE Switch Module Login](image)

Figure 14 shows the VRTX 1GbE Switch Module Home page. All Layer 2 switch configuration settings can be performed from this location.

**Figure 14. VVRTX 1GbE Switch Module Home Page**

![VRTX 1GbE Switch Module Home Page](image)
Setting Up Dell Mobility Controller

Dell Mobility Controller Login

Enter your User name and password created during the Console Configuration Setup.

Figure 15. Mobility Controller Login

Figure 16 illustrates the initial Dell Mobility Controller Dashboard page.

Figure 16. Mobility Controller Dashboard
AOS Version

You can check the current version by selecting the Maintenance tab from the Dashboard, then choosing About, as shown in Figure 17.

![Figure 17. AOS Version](image)

Licenses

Figure 18 illustrates all licenses installed on the Dell mobility controller. Verify that the Access Point license and the Policy Enforcement Firewall Next Generation (PEFNG) license are installed. To verify, navigate to Configuration -> Network -> Controller -> Licenses.

![Figure 18. Licenses](image)

Virtual AP Employee Profile

Add Employee virtual AP to default AP group. Navigate to Configuration -> All Profiles -> Wireless LAN -> Virtual AP, as shown in Figure 19. Then choose to add a “New” profile, specify the name of the profile (for example, “employee”) and click Add. Then click Apply.
Dynamic Multicast Optimization (DMO)

Select the Dynamic Multicast Optimization (DMO) checkbox, as shown in Figure 20.

Band Steering

To enable this feature, click the Band Steering checkbox, as shown in Figure 20 above. Steering Mode defaults to "Prefer 5ghz". Verify that it is selected. Click Apply to apply the changes. It is good practice to save the configuration.

With the Band Steering feature enabled, Dell access points will ignore 802.11 management Probe Requests from 2.5GHz RADIO client stations and will only respond to Probe Requests from client stations in the 5GHz frequency band, effectively steering stations to the preferred spectrum.
Access Control List (ACL) with Classify Media

Employee User Role

Figure 21 illustrates how to configure employee user roles. Navigate to Configuration -> Security -> Access Control -> Policies -> Firewall Policies. Create six new rules. Add an IP access-list session named Employee_Lync.

![Employee_Lync User Role](image)

Once Employee_Lync has been created, Figure 22 illustrates the six policies to be added.

![Employee_Lync Policy Rules](image)
Once all rules have been created and applied, Figure 23 displays Employee_Lync session.

**Figure 23. Employee_Lync Policies**

| Security > Access Control > Firewall Policies |
|---|---|---|---|---|---|---|---|
| Policies | All | IPv4 Session | IPv6 Session | Ethernet | MAC | Standard | Extended |
| Name | Type | Rule Count | Policy Usage |
|------|---|---|---|---|---|---|
| skinny-ad | session | 1 | voice |
| http-ad | session | 1 | voice |
| cloginout | session | 1 | voice guest |
| http-ad | session | 1 | guest |
| ap-ad | session | 6 | ap-role |
| sup-ad | session | 2 | voice |
| roe-ad | session | 1 | voice |
| h023-ad | session | 2 | voice |
| employee_lync | session | 0 | employee-lync |

**SSID Profile**

Configuring an SSID profile is shown in Figure 24. Navigate to Configuration -> Wireless -> AP Configuration -> Wireless LAN -> Virtual AP -> employee -> SSID Profile. Then select “New” from the SSID Profile pull-down menu. Type “dell-ap” is the default Network Name (SSID). This can be customized to each Branch Office location. The SSID can be up to 32 characters and is case sensitive. Under 802.11 Security, select WPA2 PSK as the Network Authentication and AES will automatically be selected as encryption. For format, select PSK Passphrase, then enter passphrase.

**Figure 24. Creating Employee SSID**

**NOTE**: Please consult your local Network Administrator for Pass-Phrase Security Settings.
Delivery Traffic Indication Message (DTIM)

Delivery Traffic Indication Message (DTIM) configuration is shown in Figure 25. Select Configuration -> Advanced Services -> All Profile Management -> SSID Profile -> employee ->Advanced. Then enter 3 into the DTIM Interval field.

![Employee SSID Profile Settings](image)

When setting DTIM to a value of 3, every third Management Beacon frame is a DTIM beacon for client stations to wake from a power management state to retrieve multicast traffic from Dell access points.

Wireless Multimedia (WMM)

Wireless Multimedia (WMM) is enabled by selecting the checkbox, as shown in Figure 25.

The Wi-Fi Alliance includes Wi-Fi Multimedia (WMM) as part of its Certification Program. Wi-Fi Multimedia defines Layer-2 MAC methods needed to meet the Quality of Service (QoS) requirements for time-sensitive applications.

Differential Services Code Point (DSCP)

Set DSCP mapping for WMM voice AC field to value of 46, as shown in Figure 25. See RFC 3246 Section 2.7 Recommended Code Point for Expedited Forwarding, [http://datatracker.ietf.org/doc/rfc3246/](http://datatracker.ietf.org/doc/rfc3246/).
Local Probe Request Threshold (dB)

Set the **Local Probe Request Threshold (dB)** field to value of **25**, as shown in Figure 26.

*Figure 26. Local Probe Request Threshold*

<table>
<thead>
<tr>
<th>Counters</th>
<th>Local Probe Request Threshold (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deny_Broadcast</td>
<td>25</td>
</tr>
<tr>
<td>Probe Retry</td>
<td></td>
</tr>
<tr>
<td>Battery Boost</td>
<td></td>
</tr>
<tr>
<td>WEP Key 1</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>WEP Key 2</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>WEP Key 3</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>WEP Key 4</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>WEP Transmit Key Index</td>
<td>1</td>
</tr>
<tr>
<td>WPA Hexkey</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>WPA Passphrase</td>
<td></td>
</tr>
<tr>
<td>Retype:</td>
<td></td>
</tr>
<tr>
<td>Maximum Transmit</td>
<td>0</td>
</tr>
<tr>
<td>Failures</td>
<td></td>
</tr>
<tr>
<td>BC/MC Rate Optimization</td>
<td></td>
</tr>
<tr>
<td>Rate Optimization</td>
<td></td>
</tr>
<tr>
<td>for delivering EAPOL frames</td>
<td></td>
</tr>
<tr>
<td>Strict Spectralink Voice Protocol (SVP)</td>
<td></td>
</tr>
<tr>
<td>802.11g Beacon Rate</td>
<td>default</td>
</tr>
<tr>
<td>Advertise QBSS Load IE</td>
<td></td>
</tr>
</tbody>
</table>

Broadcast/Multicast Rate Optimization (BC/MC)

Select the **BC/MC Rate Optimization** checkbox to enable the feature, as shown in Figure 26. This feature suppresses broadcast and multicast traffic on both wired and wireless networks.
Adaptive RADIO Management (ARM) Profile

VOIP Aware Scan

Navigate to Configuration -> All Profiles -> RF Management -> Adaptive RADIO Management ARM Profile -> <profile name>-> ARM Profile Details -> VOIP Aware Scan.

Figure 27. Adaptive RADIO Management (ARM) Profile

<table>
<thead>
<tr>
<th>Adaptive Radio Management (ARM) profile</th>
<th>Show Reference</th>
<th>Save As</th>
<th>Reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>single-band</td>
<td>Allowed bands for 40MHz channels</td>
<td>a-only</td>
</tr>
<tr>
<td>Client Aware</td>
<td>✓</td>
<td>Max Tx EIRP</td>
<td>127</td>
</tr>
<tr>
<td>Min Tx EIRP</td>
<td>9</td>
<td>Multi Band Scan</td>
<td>✓</td>
</tr>
<tr>
<td>Rogue AP Aware</td>
<td>□</td>
<td>Scan Interval</td>
<td>10 sec</td>
</tr>
<tr>
<td>Active Scan</td>
<td>□</td>
<td>Scanning</td>
<td>✓</td>
</tr>
<tr>
<td>Scan Time</td>
<td>110 msec</td>
<td>VoIP Aware Scan</td>
<td>✓</td>
</tr>
<tr>
<td>Power Save Aware Scan</td>
<td>✓</td>
<td>Video Aware Scan</td>
<td>□</td>
</tr>
</tbody>
</table>

This feature prevents any single access point from becoming congested with voice calls. Dell access points will not attempt to scan different channels if one client has an active VOIP call.

Power Save Aware Scan

Select the Power Save Aware Scan checkbox to enable the feature, as shown in Figure 27.

With this feature enabled, if Dell access points detect one or more clients in power save mode the access point will not scan across other channels.
Quality of Service (QoS) Profile

Airtime Fairness

Figure 28 illustrates the Traffic Management Profile. Navigate to Configuration -> All Profiles -> QoS -> Traffic Management Profile -> Profile Details. Add Lync by selecting it. In the Station Shaping Policy field, select fair-access.

This feature allows each wireless client station equal access to the wireless medium.

![Figure 28. Traffic Management Profile](image)

Guest WLAN

Figure 29 illustrates adding a guest VLAN. Configuration -> Network -> VLANS -> Add -> VLAN ID -> enter 900 -> Apply.

![Figure 29. Create Guest VLAN](image)

**NOTE:** Customers can set their own VLAN assignment. The VLAN specified here is only for explanatory purposes.
Assigning the Guest VLAN Static IP address and Source NAT

Figure 30 shows assigning the guest VLAN static IP address. Select Configuration -> Network -> IP -> IP interfaces -> Use the following IP address. Then set VLAN900 to IP address 192.168.200.1 and a Net Mask of 255.255.255.0. Under NAT, enable source NAT for the VLAN checkbox. Under Inter-VLAN Routing, deselect Enable Inter-VLAN Routing checkbox. Then click Apply.

**NOTE:** Customers can set their own Static IP VLAN and Net mask assignments. The Static VLAN IP address and Net mask are only for explanatory purposes.

![Assign VLAN Static IP Address with Source NAT](image)

Figure 30. Assign VLAN Static IP Address with Source NAT

Figure 31 shows the Dell mobility controller VLANS. Select Configuration -> Network -> VLANS. Guest VLAN is now displayed including assigned IP address and Net Mask.

![Show VLANS](image)

Figure 31. Show VLANS

**NOTE:** Figure 31 shows VLAN900 operation state as “down”. This will change to “Up” state once a guest user establishes a connection to the Guest WLAN.
Adding DHCP Guest Pool

Figure 32 shows adding DHCP guest pool. Select Configuration -> Network -> IP -> DHCP Server. Check the Enable DHCP Server checkbox, then click Add.

![Figure 32. Enable DHCP and add Guest Pool](image)

Figure 33 shows enabling DHCP and adding a guest pool. Enter “guestpool” into pool name field, then enter 192.168.200.1 as the default router. Enter the DNS Server address provided by your local network administrator, then enter 192.168.200.0 for Network IP address and 255.255.255.0 as the netmask. Finally, choose Done -> Apply -> Save Configuration.

![Figure 33. Guest DHCP Settings](image)
Display Guest Pool

Figure 34 displays the DHCP Guestpool including default router, network address, and address range.

Figure 34. DHCP Guest Pool

Guest Role Network Policies

Figure 35 illustrates setting policy role for guest users. Select Policies, then pick “guest network policy” under Policy Name. Choose Session under Policy Type. Then click Add -> Http under services -> Permit -> working hours -> Add -> Https -> Permit -> working hours -> add -> Apply.

Figure 35. Guest Role
Figure 36. Guest Role Policies

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Diagnostics</th>
<th>Maintenance</th>
<th>Plan</th>
<th>Save Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security &gt; Firewall Policies &gt; Add New Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Roles</td>
<td>System Roles</td>
<td>Policies</td>
<td>Time Ranges</td>
<td>Guest Access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy Name</th>
<th>Policy Type</th>
<th>IP Version</th>
<th>Source</th>
<th>Destination</th>
<th>Service</th>
<th>Action</th>
<th>Log</th>
<th>Mirror</th>
<th>Queue</th>
<th>Time Range</th>
<th>Pause ARM Scanning</th>
<th>BlackList</th>
</tr>
</thead>
<tbody>
<tr>
<td>guest network policy</td>
<td>Session</td>
<td>IPv4</td>
<td>any</td>
<td>any</td>
<td>svc-http</td>
<td>permit</td>
<td>low</td>
<td>working-hours</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>guest network policy</td>
<td>Session</td>
<td>IPv4</td>
<td>any</td>
<td>any</td>
<td>svc-https</td>
<td>permit</td>
<td>low</td>
<td>working-hours</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 36 above illustrates HTTP and HTTPS services only allowed during work hours for guest users.

**Guest Role Time Range**

Figure 37 shows how to allow guest users WEB access only during business hours. Select Configuration -> Security -> Access Control -> Time Ranges -> Add -> guest work hours in “name” field -> Periodic -> Add -> Weekday -> 08:00 for start time -> 17:00 for end time -> Done -> Apply.

Figure 37. Time Range
Create Guest Role

Figure 38 shows how to create guest user role. Select User Roles -> Add -> Guest role Name -> guest network policy from drop down list -> Done -> Apply.

![Create Guest Role](image)

Guest Virtual AP

Configuring guest virtual AP is shown in Figure 39. Select Configuration -> Wireless -> AP Configuration -> AP Specific -> select guest Ap’s from the list -> Add -> select the guest AP -> Wireless LAN -> Virtual AP -> Add “new” profile named guest -> Apply.

![Guest VAP](image)
As shown in Figure 40, ensure Guest -> Virtual AP checkbox is enabled and VLAN is set, then select Apply. Select AAA Profile -> default-open -> Apply.

**Figure 40. Virtual AP Guest**

As shown in Figure 41, select “New” SSID profile named “guest”. Enter Network Name as guest. Choose “None” for Network Authentication and “Open” for Encryption. Then click Apply.

**Figure 41. Guest SSID Profile**
Guest Wireless Client Connection

Figure 42 shows an established wireless client’s connection status to the Guest SSID.

Figure 42. Client’s Connection

Mobility Controller Guest VLAN Interface now “UP”

Figure 43 shows the Guest VLAN operational state as “Up”. You can check the state by selecting Configuration -> IP -> IP Interfaces.

Figure 43. Mobility Controller Guest VLAN Operational “Up” Status
Additional Resources

Recommended Dell publications:

- Dell PowerEdge VRTX Product Page
- Dell Chassis Management Controller For PowerEdge VRTX
- Dell Networking W-Series Mobility
- Dell Networking W-Series Mobility Software
- Dell Networking W-Series Mobility Support
- Microsoft Lync Server 2010 on Dell Systems

Recommended Microsoft publications:

- Microsoft Lync Qualified Infrastructure