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Avaya Solution & Interoperability Test Lab

Application Notes for configuring NVT Phybridge FLEX24-10G RJ45 extended reach switch with Avaya Aura® Communication Manager and Session Manager – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the NVT Phybridge FLEX24-10G R1.0 extended reach switch to interoperate with Avaya Aura® Communication Manager and Session Manager R8.1. In the compliance testing, the NVT Phybridge FLEX24-10G switch leveraged 4-pair CAT6 wiring to provide extended range Ethernet voice path and Power over Ethernet for Avaya IP endpoints registering to Avaya Aura® Session Manager.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

These Application Notes describe a compliance tested configuration consisting of the NVT Phybridge FLEX24-10G switch and NVT Phybridge FLEX adapters (FLEX-C, FLEX-Link, and FLEX4) used to allow Avaya endpoints to connect with Avaya Aura® Communication Manager over 4-pair CAT6 cable. The NVT Phybridge FLEX24-10G switch is a LAN appliance that leverages 4-pair CAT6 wiring to provide extended range Ethernet and Power over Ethernet to Avaya IP endpoints registered to Avaya Aura® Session Manager.

The FLEX24-10G switch has a reach of 2000 feet and is capable of delivering power and signalling over CAT6 cable. A FLEX Adapter installed at each IP endpoint carries power and signalling to connected IEEE 802.3af/at compliant end devices. The default FLEX24-10G switch/FLEX Adapter configuration supports IP phones and provides a plug and play solution for replacing a legacy voice network using the existing network cabling plan. A single FLEX24-10G switch powers up to 24 IP phones.

2. General Test Approach and Test Results

The compliance testing focused on interoperability between the NVT Phybridge FLEX24-10G switch and Communication Manager to ensure that the Avaya IP endpoints (models listed in **Section 4**) can communicate correctly with Communication Manager over 2000 ft of 4-pair CAT6 cable.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products. Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these application notes, security encryption features were not applicable on the interface between Avaya systems and the NVT Phybridge FLEX24-10G switch. However, the Avaya equipment used TLS over the connection provided by the FLEX24-10G switch.

2.1. Interoperability Compliance Testing

Testing consisted of typical call scenarios involving Avaya endpoints registered to Communication Manager and Session Manager. The test focused on endpoints connecting over 2000ft of 4-pair CAT6 cable to verify the extended range that the FLEX24-10G switch provides. Local power was not employed for the Avaya IP endpoints.

Using the NVT Phybridge FLEX24-10G switch and the NVT Phybridge FLEX adapters, the Avaya IP endpoints should function normally over a CAT6 4 pair cable connected to Communication Manager and Session Manager. The testing focused on the following areas:

- **Avaya IP endpoint connections over 4-pair CAT6 cable without FLEX adapters** – The Avaya IP endpoints are connected to the Avaya solution over the 4-pair CAT6 cable without any NVT Phybridge equipment. Failure is expected for this scenario.
- **Avaya IP endpoint connections over 4-pair CAT6 cable with FLEX adapters** – The Avaya IP endpoints are connected to the Avaya solution over the 4-pair CAT6 cable with the NVT Phybridge equipment in use to ensure that the IP endpoints can register and work as normal.
- **Basic Calls** – Basic incoming and outgoing calls made using Avaya IP endpoints.
- **Call Hold/Transfer and Conference** – Calls made with transfer and conference.
- **MWI** – Leaving and retrieving messages insuring MWI functionality.
- **Secondary Wired Ethernet Interface** – Ethernet connectivity made through the secondary ports
- **USB ports** – Headset use and power to endpoint USB ports supplied as the endpoints support.
- **Long Duration Calls** – Calls maintained over 1 hour
- **Serviceability –** FLEX24-10G switch recovery from adverse conditions, such as re-connecting Ethernet cables to the FLEX24-10G switch and re-connecting the FLEX Adapters.

2.2. Test Results

All applicable test cases passed with the following observations noted:

1. The CAT6 ethernet cable used for the extended reach configuration must be solid copper. Lower cost alternatives such as copper clad aluminum (CCA) ethernet cable will not function properly.

2. The Avaya Vantage Endpoints had intermittent USB headset connection problems. The display cycled an 'Insufficient power to USB port' message. This is resolved by setting the endpoint's FLEX PoE port control to **Manual** in the FLEX24-10G administration interface, by using local power with the endpoints, or by using Bluetooth connectivity for the headset.

2.3. Support

Technical support on the NVT Phybridge FLEX24-10G switch can be obtained through the following links:

- Technical Support Hours and Contact Information: https://www.nvtPhybridge.com/support-ticket/
- Email: support@nvtphybridge.com
- Web: https://www.nvtphybridge.com

3. Reference Configuration

In the test configuration shown in **Figure 1,** the NVT Phybridge FLEX24-10G switch is connected into the existing Avaya telephony LAN. Avaya IP endpoints are connected to the LAN over 4-pair CAT6 cabling. For each Avaya IP endpoint on the FLEX24-10G switch, one end of the 4-pair CAT6 cable is connected to the NVT Phybridge FLEX24-10G switch and the other end of the cable connects to a NVT Phybridge FLEX adapter. Each FLEX adapter is connected to an Avaya endpoint using a standard CAT5 or 4-pair CAT6 Ethernet cable.
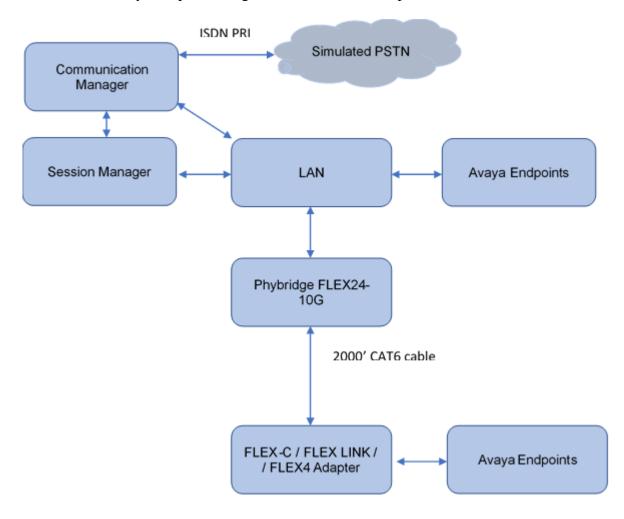

Figure 1: NVT Phybridge FLEX24-10G switch with Avaya Aura® Communication Manager R8.1 and Avaya Aura® Session Manager R8.1

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4. Equipment and Software Validated

The following equipment and software versions were used in the reference configuration:

Equipment/Software	Release/Version
Avaya G450 Media Gateway	41.34.1
Avaya Aura® Communication Manager running on a virtual server	8.1.3.0.1.890.26685
Avaya Aura® Session Manager running on Virtual Server	8.1.3.0.813014
Avaya 9641 SIP	7.1.11.0-092520
Avaya J129 SIP	4.0.7.1-121020
Avaya J159 SIP	4.0.7.1-121020
Avaya J169 SIP	4.0.7.1-121020
Avaya J179 SIP	4.0.7.1-121020
Avaya J189 SIP	4.0.7.1-121020
Avaya Vantage K155	3.0.0.1.0014
Avaya Vantage K175	3.0.0.1.0014
NVT Phybridge FLEX24 10G Switch	FLEX24-10G ver. 1.0.5347M
NVT Phybridge FLEX4 Adapter	N/A
NVT Phybridge FLEX-Link Adapter	N/A
Phybridge FLEX-C Adapter	N/A

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5. Configure Avaya Aura® Communication Manager

No specific configuration is required on either Communication Manager or Session Manager for setup with the FLEX24-10G switch. Interoperability testing uses Avaya IP endpoints registering to Session Manager and a connected Communication Manager. The Avaya IP endpoints not using the FLEX24-10G are connected to the Avaya network switch with 3 to 6 ft of 4-pair CAT 5E or CAT6 cable. The Avaya endpoints using the FLEX24-10G switch are connected to the FLEX adapters with 3 to 6 ft of 4 pair CAT5E or CAT6 cable. The FLEX adapters are then connected to 2000 ft of 4-pair CAT6 Ethernet cable terminating to the FLEX24-10G 24 port switch.
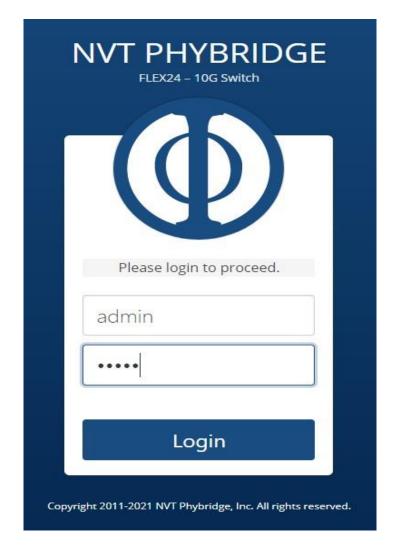
6. Configure NVT Phybridge FLEX24-10G Switch

The FLEX24-10G switch configuration requires the following for configuration:

- Set IP address.
- Configure VLAN to use a downlink port connection for network access. Network access is also provided using the uplink ports. Ethernet connectivity used a downlink port for this test.

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6.1. Set IP address

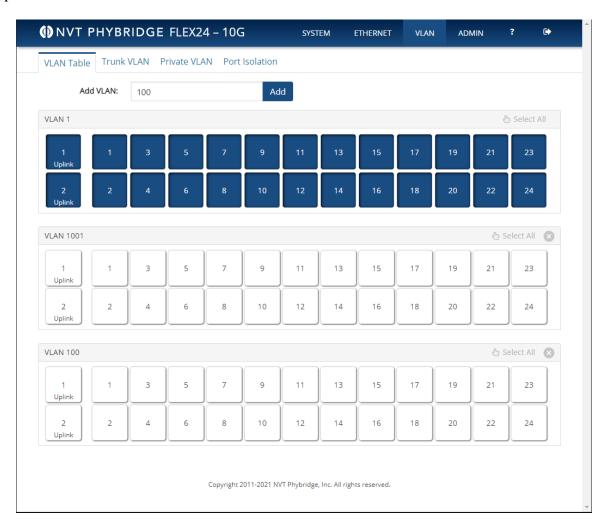The IP address can be set through the uplink/downlink port or the management port.

The default IP address for the uplink/downlink is **192.168.100.1**. Set the IP address of a laptop to **192.168.100.10**. Any suitable address in the **192.168.100** subnet may be used. The administration interface can be accessed via **192.168.100.1.** Log in to the interface with appropriate credentials.

Administrators can also access configuration via the management port. The IP address for the management interface is **192.168.1.1.** The laptop IP address must be in the **192.168.1** subnet and connected to the management port. Instructions to configure FLEX24 through the management port are in reference **5** listed in **Section 9**.
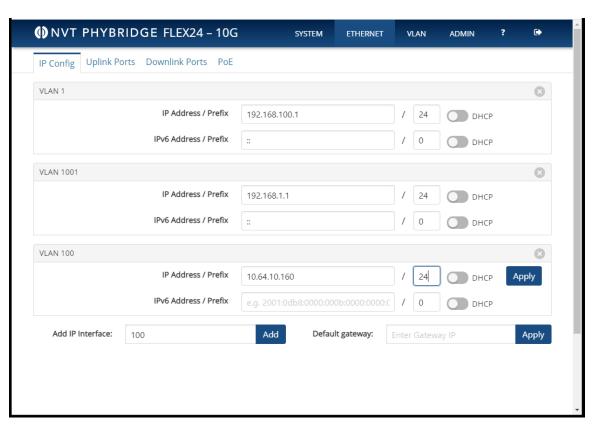
6.2. Add VLAN for the assigned IP address

Select **VLAN** in the title bar and click on the **VLAN Table** tab. Type **100** in the **Add VLAN** input box. Click **Add**.

Select **Ethernet** from the title bar and click on the **IP Config** tab. Input **100** in the **Add IP Interface** input box and click **Add**.
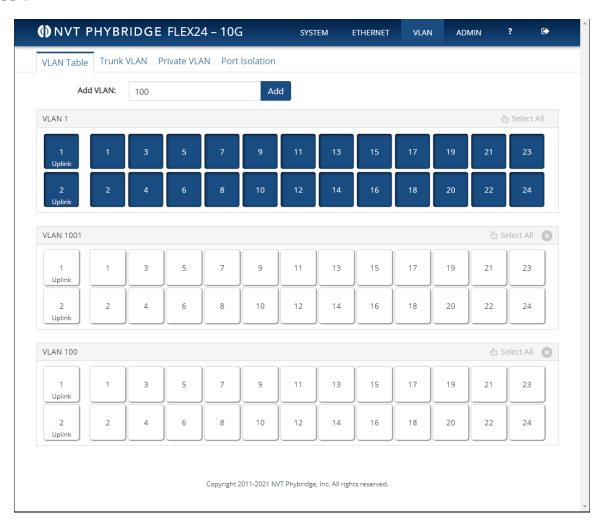

VLAN 100 displays. For VLAN 100, change the IP address to that planned for the FLEX24-10G and **24** for 24 bit subnet mask (255.255.255.0). The assigned IP address used for this test is **10.64.10.160.** Click **Apply**.

6.3. Assign ports to VLAN 100

Select **VLAN** in the title bar and click on the **VLAN** tab. Click on **Select All** for **VLAN 1** and then click on a port in **VLAN 100**. The selected ports should now be in **VLAN 100** box. Click on **Apply Edits**.

Once this is done, connectivity to the web interface is interrupted. Change the laptop IP address from **192.168.100.10** to an address that is in the subnet of the FLEX24 IP set in **Section 6.2**. The test configuration uses the **10.64.10** subnet.

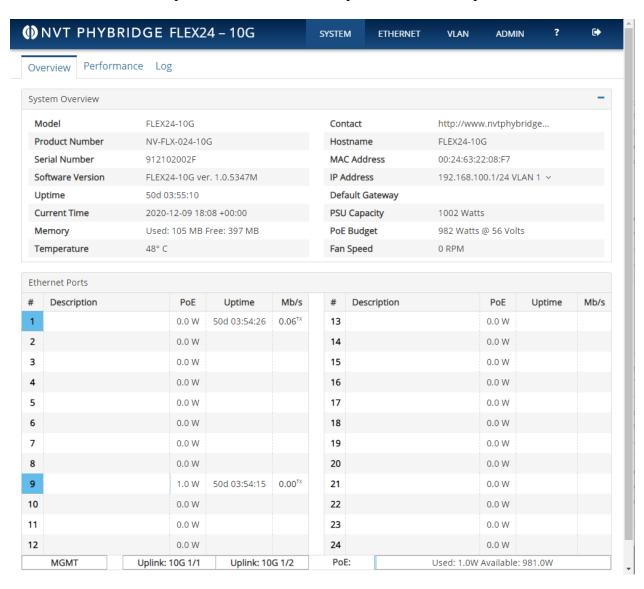Log in to the web interface. Select **Ethernet** from the title bar and click on the **Downlink Ports** tab. For port 1, the connection used to the Avaya ethernet switch, check the **IEEE** checkbox. This allows for a fast connection to be specified for the port. The interoperability test connection speed was 1Gb.

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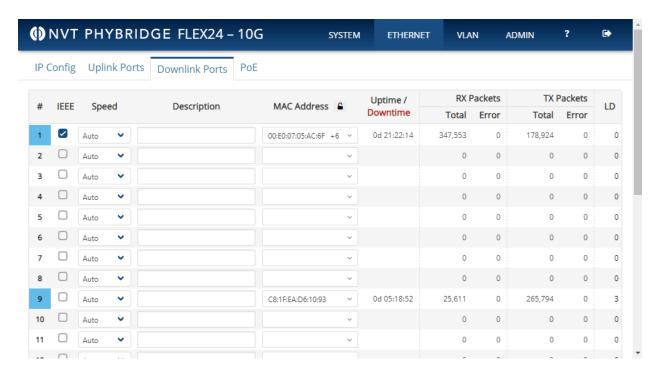©2021 Avaya Inc. All Rights Reserved.

7. Verification Steps

This section provides information verify a proper configuration of the FLEX24-10G switch.
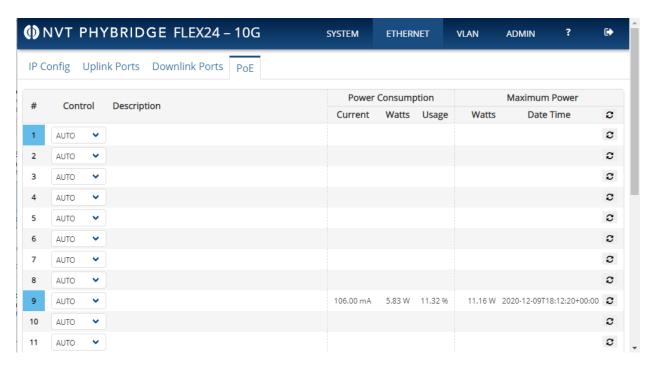
Browse to the IP Address of the FLEX24-10G and log in using valid credentials. Select **SYSTEM** in the title bar and click on the **Overview** tab. The **Ethernet Ports** table should have highlighted ports for the network connection and for any attached endpoints. Here, the network connection is on ethernet port **1** and a connected endpoint is on ethernet port **9**.

NVT PHYBRIDGE FLEX24 – 10G   SYSTEM   ETHERNET   VLAN   ADMIN   ?

Overview   Performance   Log

System Overview

Model	FLEX24-10G	Contact	http://www.nvtphybridge...
Product Number	NV-FLX-024-10G	Hostname	FLEX24-10G
Serial Number	912102002F	MAC Address	00:24:63:22:08:F7
Software Version	FLEX24-10G ver. 1.0.5347M	IP Address	192.168.100.1/24 VLAN 1 ˅
Uptime	50d 03:55:10	Default Gateway	
Current Time	2020-12-09 18:08 +00:00	PSU Capacity	1002 Watts
Memory	Used: 105 MB Free: 397 MB	PoE Budget	982 Watts @ 56 Volts
Temperature	48° C	Fan Speed	0 RPM

Ethernet Ports

#	Description	PoE	Uptime	Mb/s	#	Description	PoE	Uptime	Mb/s
1		0.0 W	50d 03:54:26	0.06^{TX}	13		0.0 W		
2		0.0 W			14		0.0 W		
3		0.0 W			15		0.0 W		
4		0.0 W			16		0.0 W		
5		0.0 W			17		0.0 W		
6		0.0 W			18		0.0 W		
7		0.0 W			19		0.0 W		
8		0.0 W			20		0.0 W		
9		1.0 W	50d 03:54:15	0.00^{TX}	21		0.0 W		
10		0.0 W			22		0.0 W		
11		0.0 W			23		0.0 W		
12		0.0 W			24		0.0 W		
MGMT		Uplink: 10G 1/1	Uplink: 10G 1/2		PoE:		Used: 1.0W Available: 981.0W		

Select **ETHERNET** on the title bar and click on the **Downlink Ports**. The display will show data transmission and the MAC ID of the connected devices.

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Click on the **PoE** tab. The display will show power consumption of the currently connected endpoints.

#	Control	Description	Power Consumption			Maximum Power		
			Current	Watts	Usage	Watts	Date Time	⟳
1	AUTO ⌄							⟳
2	AUTO ⌄							⟳
3	AUTO ⌄							⟳
4	AUTO ⌄							⟳
5	AUTO ⌄							⟳
6	AUTO ⌄							⟳
7	AUTO ⌄							⟳
8	AUTO ⌄							⟳
9	AUTO ⌄		106.00 mA	5.83 W	11.32 %	11.16 W	2020-12-09T18:12:20+00:00	⟳
10	AUTO ⌄							⟳
11	AUTO ⌄							⟳

Connect an Avaya IP endpoint using a connection through the FLEX24 and FLEX adapter. Make a call and verify two way audio.

8. Conclusion

These Application Notes describe the configuration steps required for NVT Phybridge FLEX24-10G switch to interoperate with Avaya Aura® Communication Manager. All feature and serviceability test cases were completed with observations noted in **Section 2.2**.

9. Additional References

This section references the product documentation relevant to these Application Notes. Documentation for Communication Manager and Session Manager can be found at http://support.avaya.com.

1. *Administering Avaya Aura® Communication Manager*, Issue 10, Release 8.1.x, March 2021
2. *Avaya Aura® Communication Manager Feature Description and Implementation*, Issue 16, Release 8.1.x, March 2021
3. *Administering Avaya Aura® Session Manager*, Issue 8, Release 8.1.x, February 2021
4. *Administering Avaya Aura® System Manager*, Issue 11, Release 8.1.x, April 2021
5. *FLEX24-10G Administration Guide, https://www.nvtphybridge.com/wp-content/uploads/PDF/FLEX24-10G%20ADMINISTRATION%20GUIDE.pdf*

Additional documentation for NVT Phybridge products may be found at http://nvtphybridge.com