



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for Phybridge PoLRE with Avaya Communication Server 1000E 7.6 – Issue 1.0**

### **Abstract**

These Application Notes describe the configuration steps required for Phybridge PoLRE to interoperate with Avaya Communication Server 1000E 7.6. In the compliance testing, the Phybridge PoLRE leveraged the existing single-pair telephony wiring to provide dedicated Ethernet voice path and Power over Ethernet (PoE) to Avaya UNISTim and SIP IP telephones registered to Avaya Communication Server 1000E (Avaya CS 1000E).

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.

# 1. Introduction

These Application Notes describe a compliance-tested configuration consisting of Phybridge PoLRE, Phybridge Phylink adapters, Avaya Communication Server 1000E (Avaya CS 1000E) and Avaya IP telephones (UNISlim and SIP).

The Phybridge PoLRE is a LAN appliance that leverages the existing single-pair telephony wiring to provide dedicated Ethernet and Power over Ethernet to Avaya IP telephones.

## 2. General Test Approach and Test Results

The compliance testing focused on the interoperability between Phybridge PoLRE and Avaya IP telephones to ensure that the phones work as expected. Serviceability testing was also performed.

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.

### 2.1. Interoperability Compliance Testing

Testing consisted of typical call scenarios involving Avaya endpoints connected to PoLRE. External call scenarios were also tested with a simulated PSTN connection. All tests were performed manually and the focus was on verifying interoperability compliance.

Feature testing included, registration, audio codec, basic calls, hold/reconnect, conference, transfer, display, DTMF, and message waiting indicator (MWI) scenarios.

The serviceability testing focused on verifying the ability of Phybridge PoLRE to recover from adverse conditions, such as disconnecting and reconnecting the Ethernet cables to the Phybridge PoLRE and to the Avaya IP telephones. Reboots and power cycling of Phybridge PoLRE were also tested.

### 2.2. Test Results

All applicable test cases were executed and passed with the following observation:

The Avaya B179 Conference Phone (B179) was powered with its local power supply and connected to the Phylink adapter with an Ethernet cable as per **Reference 3 in Section 10**. This configuration was used because the B179 phone required more PoE power than could be supplied by PoLRE. Other Class 3 endpoints may also require this configuration. PoLRE Switches can power Class 1, Class 2 and some Class 3 IEEE 802.3af compliant IP devices.

## 2.3. Support

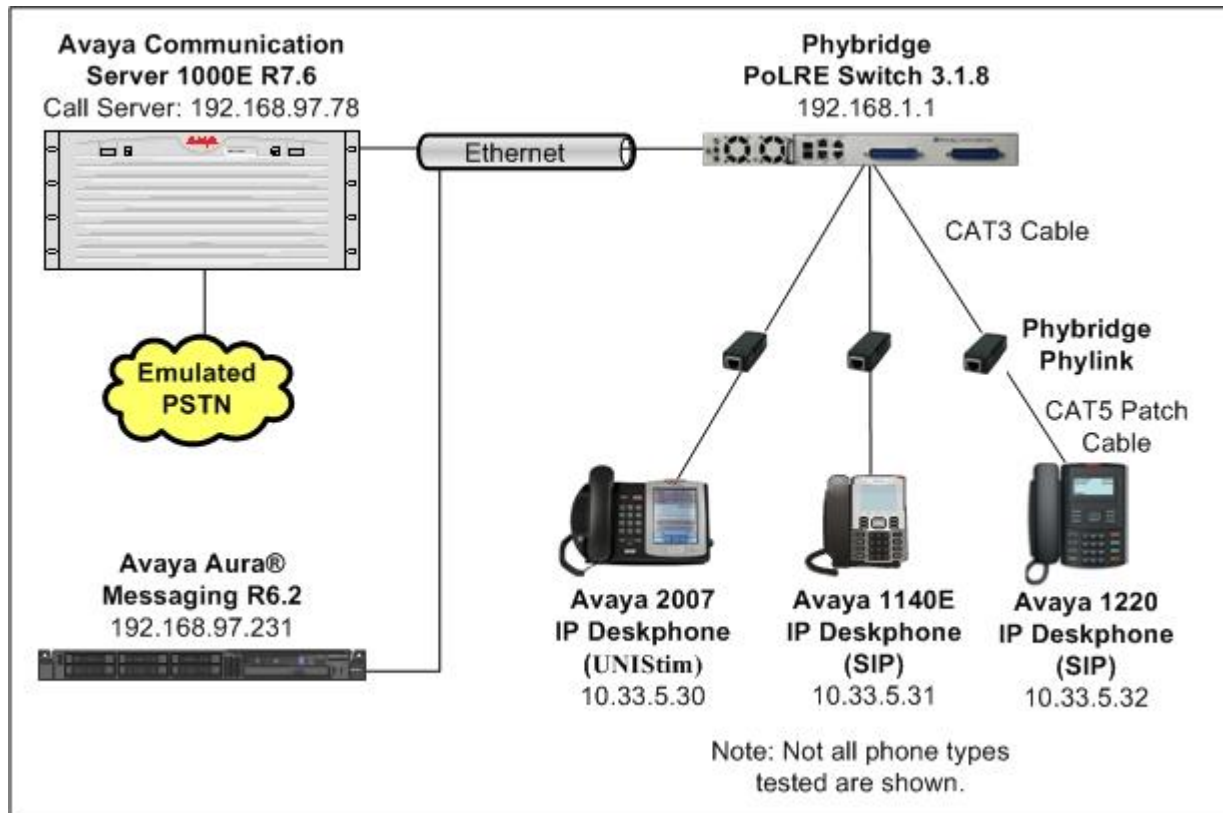
Technical support for Phybridge PoLRE can be obtained through the following:

- **Phone:** (888) 901-3633
- **Email:** [Support@Phybridge.com](mailto:Support@Phybridge.com)

## 3. Reference Configuration

In the test configuration shown in **Figure 1**, Avaya IP telephones (UNISim and SIP) are connected to the network via the Phybridge PoLRE leveraging the existing CAT3 cabling that was previously used for Analog and Digital phones. For each station user, one end of the CAT3 cable is changed to connect to the Phybridge PoLRE instead of the Analog or Digital Line circuit pack on Avaya CS 1000E. The other end of the CAT3 cable connects to a Phybridge Phylink adapter with an RJ11 connector. Each Phylink adapter is connected using a standard CAT5 Ethernet cable to an Avaya IP telephone.

The Phybridge PoLRE provides power to the Avaya IP telephones, and is transparent to the telephones in terms of the telephones' network settings.



**Figure 1: Phybridge PoLRE with Avaya Communication Server 1000E**

## 4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

<b>Equipment/Software</b>	<b>Release/Version</b>
Avaya Communication Server 1000E CPPM co-resident server	Call Server (CPPM): 7.65 P + Signaling Server (CPPM): 7.65.16.00
Avaya Aura® System Manager running on S8800 Server	6.3.0 - FP2 Build No. - 6.3.0.8.5682-6.3.8.1627
Avaya 2007 IP Deskphone (UNISlim)	5.5.1 (0621C8T)
Avaya 1165E IP Deskphone (UNISlim)	5.5.1 (0626C8T)
Avaya 1140E IP Deskphone (SIP)	4.4 (SIP1140e04.04.10.00)
Avaya 1210 IP Deskphone (UNISlim)	5.5.1 (062AC8T)
Avaya 1220 IP Deskphone (SIP)	4.4 (SIP12x004.04.10.00)
Avaya B179 Conference Phone (SIP)	2.3.8
Phybridge Phylink	PL-PA011
Phybridge PoLRE Switch PL-048/024	3.1.8

## 5. IP Phone Configuration on Avaya Communication Server 1000E

No special configuration is required for Avaya UNISlim and SIP IP phones to interoperate with the PoLRE switch. It is assumed that Avaya CS 1000E has already been installed and is functioning. For more information refer to documents listed in **Section 10**.

In a typical installation of Phybridge PoLRE, analog and digital telephones using existing CAT3 cabling would be replaced with new IP telephones as described in **Section 3**. This section shows an example of configuring a new Avaya UNISlim IP telephone.

### 5.1. Log in to Avaya Communication Server 1000E Element Manager

Access the browser-based GUI of System Manager, using the URL <http://<FQDN>/SMGR>, where <FQDN> is the fully qualified domain name of System Manager. Log in to System Manager with the appropriate credentials (not shown).

On the System Manager home screen under the **Elements** column select **Communication Server 1000**.

The screenshot displays the Avaya Aura System Manager 6.3 interface. At the top left is the AVAYA logo. The main title is "Avaya Aura® System Manager 6.3". On the top right, it shows "Last Logged on at March 12, 2014 4:34 PM" and "Help | About | Change Password | Log off admin". The main content area is organized into three columns: "Users", "Elements", and "Services".

- Users:**
  - Administrators: Manage Administrative Users
  - Directory Synchronization: Synchronize users with the enterprise directory
  - Groups & Roles: Manage groups, roles and assign roles to users
  - User Management: Manage users, shared user resources and provision users
- Elements:**
  - Communication Manager: Manage Communication Manager 5.2 and higher elements
  - Communication Server 1000: Manage Communication Server 1000 elements
  - Conferencing: Manage Conferencing Multimedia Server objects
  - IP Office: Manage IP Office elements
  - Meeting Exchange: Manage Meeting Exchange and Avaya Aura Conferencing 6.0 elements
  - Messaging: Manage Avaya Aura Messaging,
- Services:**
  - Backup and Restore: Backup and restore System Manager database
  - Bulk Import and Export: Manage Bulk Import and Export of Users, User Global Settings, Roles, Elements and others
  - Configurations: Manage system wide configurations
  - Events: Manage alarms, view and harvest logs
  - Geographic Redundancy: Manage Geographic Redundancy
  - Inventory: Manage, discover, and navigate

The **Elements** screen is then displayed. Click on the element Name of the Avaya CS 1000E **Element Manager (EM)** as in the figure below.

Host Name: devsmgr.bwwdev.com User Name: admin

**Elements**

New elements are registered into the security framework, or may be added as simple hyperlinks. Click an element name to launch its management service. You can optionally filter the list by entering a search term.

Search Reset

	Element Name	Element Type	Release	Address	Description
1	devsmgr.bwwdev.com (primary)	Base OS	7.6	192.168.97.196	Base OS element.
2	<b>EM on sip175</b>	CS1000	7.6	192.168.97.78	New element.
3	cpm3.bwwdev.com (member)	Linux Base	7.6	192.168.97.150	Base OS element.
4	sip175.bwwdev.com (member)	Linux Base	7.6	192.168.97.136	Base OS element.
5	192.168.97.79	Media Gateway Controller	7.6	192.168.97.79	New element.

## 5.2. Confirm Node and IP Address

These Application Notes assume that the basic configuration has already been administered and a Node has already been created. This section describes the steps to obtain the Node ID of the Avaya CS 1000E IP network to be used with this sample configuration. For further information on Avaya Communications Server 1000E, please consult references in **Section 10**.

From the Element Manager page, Select **System** → **IP Network** → **Nodes: Servers, Media Cards** and then click on the appropriate **Node ID**. In this sample configuration Node **511** was used.

Managing: System » IP Network » IP Telephony Nodes Username: admin

**IP Telephony Nodes**

Click the Node ID to view or edit its properties.

Add... Import... Export... Delete Print Refresh

Node ID	Components	Enabled Applications	ELAN IP	Node/TLAN IPv4	Node/TLAN IPv6	Status
<b>511</b>	1	LTPS, Gateway ( SIPGw )	-	192.168.97.149	-	Synchronized
512	1	SIP Line, LTPS	-	192.168.97.187	-	Synchronized

Show:  Nodes  Component servers and cards  IPv6 address

Click on the Node number link. The **Node Details** screen is then displayed with additional details as shown below. Make a note of the **Node IPv4 address** below as it will be used in other sections of this document. In this sample configuration it is **192.168.97.149**.

**Node Details (ID: 511 - LTPS, Gateway ( SIPGw ))**

Node ID:	<input type="text" value="511"/>	* (0-9999)	TLAN address type:	<input checked="" type="radio"/> IPv4 only
Call server IP address:	<input type="text" value="192.168.97.78"/>	*		<input type="radio"/> IPv4 and IPv6
<b>Embedded LAN (ELAN)</b>			<b>Telephony LAN (TLAN)</b>	
Gateway IP address:	<input type="text" value="192.168.97.65"/>	*	Node IPv4 address:	<input type="text" value="192.168.97.149"/>
Subnet mask:	<input type="text" value="255.255.255.192"/>	*	Subnet mask:	<input type="text" value="255.255.255.192"/>
			Node IPv6 address:	<input type="text"/>

\* Required Value.

### 5.3. IP Sets Configuration

To create an IP Set on Avaya CS 1000E, use an SSH terminal emulator to connect to Avaya CS 1000E and log in with the appropriate credentials. Overlay 11 is used to enter the new set configuration. Enter **ld 11** to enter overlay 11 and then enter the appropriate data as shown in red below. In this sample configuration defaults were used for the remaining prompts.

```
>ld 11
...
REQ: new           ← Enter new to add a new phone
TYPE: 1210        ← Enter the phone type
TN   096 0 01 26 ← Enter an available TN
DES  1210        ← Enter a description
CUST 0           ← Enter the Customer number
NUID
NHTN
ZONE 1           ← Enter the Zone to use
MRT
ERL
ECL
FDN
TGAR
LDN
NCOS
RNPG
SSU
SCPW
SGRP
SFLT
CAC_MFC
CLS
HUNT
SCI
PLEV
DANI
AST
IAPG
MLWU_LANG
MLNG
DNDR
KEY 0 scr 54715 ← Configure Key 0 to use extension (DN) 54715
  MARP
  CPND
  VMB
KEY
...
REQ:
```



## 6. Configure an IP Telephone

First configure the IP set to either get a valid IP address using DHCP or assign a static address. Next configure the **S1** and **S2** IP values to be the **Node IP** from **Section 5.2** In this sample configuration it is 192.168.97.149. Set the **Port** to **4100**.

Now reboot the IP set. When booting up, the phone will prompt for Node ID and TN. Enter the **Node ID** from **Section 5.2** and **TN** that was used in **Section 5.3**.

## 7. Configure Phybridge PoLRE

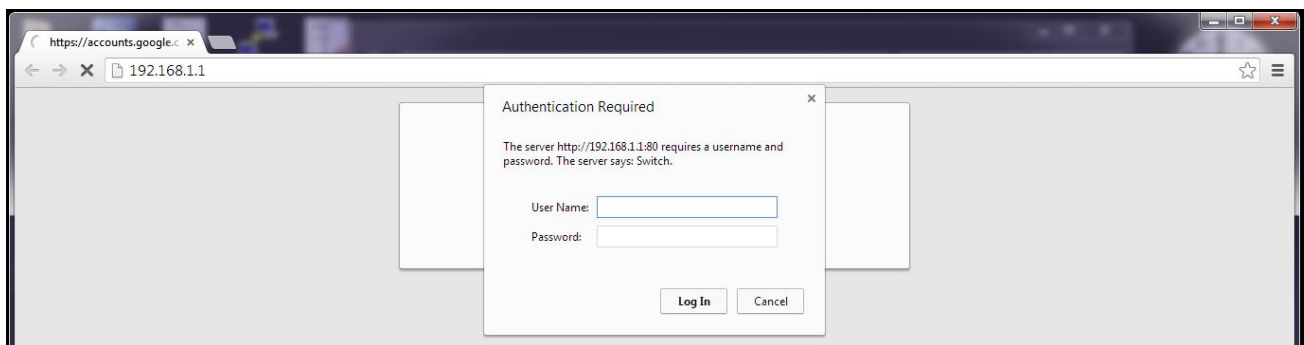
This section provides the procedures for configuring the PoLRE. The procedures fall into the following areas:

- Launch web interface
- Administer Phybridge PoLRE IP Address

All remaining configuration settings on PoLRE were left as default in this sample configuration.

### 7.1. Launch Web Interface

Access the PoLRE web interface by using the URL “http://ip-address” in an Internet browser window (Chrome and Firefox supported), where “ip-address” is a valid IP address of the PoLRE switch. The default IP address of the PoLRE management port is “192.168.1.1” and the default IP address of the PoLRE GBE ports is “192.168.100.1”. In this example the web interface of the PoLRE switch was accessed by the management port. The **Web Interface Login** screen is displayed as shown below. Log in using the appropriate credentials.



## 7.2. Administer Phybridge PoLRE IP Address

In the subsequent screen, select **ETHERNET** from the options at the top of the screen, then select the **UPLINK PORTS** tab. On this page the IP Address configuration of the PoLRE switch can be changed if required to match a given network. In this sample configuration the default values were used as below.

The screenshot displays the configuration page for a Phybridge PoLRE Switch. At the top, there are navigation tabs: SYSTEM, ETHERNET (selected), VLAN, and ADMIN. Below these are sub-tabs for UPLINK PORTS and DOWNLINK PORTS. The UPLINK PORTS tab is active, showing three main configuration sections:

- Configure GbE Interface:** IP Address: 192.168.100.1, Net Mask: 255.255.255.0, Broadcast: 192.168.100.255, GbE1 Medium: Copper, GbE2 Medium: Copper. An APPLY button is at the bottom right.
- Configure Management Port:** IP Address: 192.168.1.1, Net Mask: 255.255.255.0, Broadcast: 192.168.1.255, Default PVID: 1001. An APPLY button is at the bottom right.
- Configure IP Route:** Default Gateway: 192.168.100.254, Interface: GbE. An APPLY button is at the bottom right.

A SAVE CHANGES button is located at the bottom right of the configuration area. Below the configuration sections is a Caution! section with the following text:

- If the IP address is changed, the gateway for that port will be cleared if already assigned (reassign if required) and the new IP address will be required to log back into the box.
- The management port IP address and the uplink port IP address must be not on the same subnet.
- You may have your gateway assigned to only one interface, either the GBE ports or the Management port.
- The Default PVID field for the Management port is 1001 and cannot be changed.
- If you switch the interface between Copper and Fiber, it may take several seconds to regain connectivity.
- If you switch from Fiber to Copper, you will need to restart your switch for the changes to take affect after saving.
- If you do not click SAVE CHANGES, some changes you have made on this tab may be lost after a system reboot.

## 8. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya CS 1000E and PoLRE.

### 8.1. Verify Avaya Communication Server 1000E

The status of UNISlim IP phones can be verified as follows. Use an SSH terminal emulator to connect to the IP address of the Signalling Server and log in with the appropriate credentials. Now run the command “isetShow” to verify that the UNISlim IP phones have registered to Avaya CS 1000E successfully. The phone from **Section 5** is shown below in red. Verify that the **State** of the phone is **online**.

```
[admin@cppm3 ~]$ isetShow
=== TPS ===

Set Information
-----
IP Address      NAT Model Name      Type      RegType State      Up Time      Set-TN      Regd-TN
HWID           FWVsn UNISlimVsn SrcPort DstPort RFC2833PTTx
-----
10.33.5.40      1110 IP Deskphone      1110      Regular online      70 17:20:50 096-00-00-21 096-00-00-21
18-0016ca00cfe2-6623 C8Q 5.0 5100 5000 255
10.33.5.7      2004 Phase 2 IP Deskphone 2004P2      Regular online      70 17:25:06 096-00-00-18 096-00-00-18
18-000ae40d9458-6602 DCO 3.0 5100 5000 255
10.33.5.48      IP Phone 2004 Phase 0/1 2004P1      Regular online      29 21:48:07 096-00-00-00 096-00-00-00
18-000ae405c8a5-6600 B76 2.9 5100 5000 255
192.168.245.36 C 2004 Phase 2 IP Deskphone 2004P2      Branch online      0 20:37:45 096-00-01-22 096-00-01-22
18-000ae474d299-6602 DCO 3.0 5100 5000 255
192.168.245.104 C 2004 Phase 2 IP Deskphone 2004P2      Regular online      0 20:37:26 096-00-01-24 096-00-01-24
18-000ae474d30c-6602 DCO 3.0 5100 5000 255
10.33.6.3      1120E IP Deskphone      1120      Regular online      29 17:01:47 104-00-01-00 104-00-01-00
18-001765fdbf55-6624 C8Q 5.0 5100 5000 255
192.168.98.148 1110 IP Deskphone      1110      Regular online      28 18:46:34 096-00-00-19 096-00-00-19
18-001765fda80f-6623 C8Q 5.0 5100 5000 255
192.168.98.146 1150E IP Deskphone      1150      Regular online      70 17:24:06 096-00-02-05 096-00-02-05
18-c8f406e01528-6627 C8Q 5.0 5100 5000 255
10.33.5.73      1210 IP Deskphone      1210      Regular online      0 17:08:52 096-00-01-26 096-00-01-26
18-0019e1e71fd1-662a C8T 5.0 5100 5000 255
10.33.5.55      1165E IP Deskphone      1165      Regular busy      6 20:44:09 096-00-02-06 096-00-02-06
18-ccf954967f92-6626 C8T 5.0 5100 5000 255

Total sets = 10
[admin@cppm3 ~]$
```

## 8.2. Verify Phybridge PoLRE

From the PoLRE web interface, select **SYSTEM** from the options at the top of the screen, then select the **OVERVIEW** tab. The **System Overview** screen is displayed. Verify in the **Ethernet Port Status** section of the page that all **DOWNLINK** ports are up that have physically connected IP Phones, as shown below for ports 1, 5, 9 and 13.

The screenshot displays the Phybridge PoLRE Switch web interface. At the top, there is a navigation bar with the following tabs: SYSTEM, ETHERNET, VLAN, and ADMIN. Below this, there are three sub-tabs: OVERVIEW (selected), PERFORMANCE, and NETWORK STATS. The main content area is divided into two sections: System Overview and Ethernet Port Status.

**System Overview**

Model	PoLRE Switch - 48 Port	Host Name	PoLRE
Product Number	PL-048	IP Address	192.168.100.1
Serial Number	2156370040	MAC Address	00:24:63:02:1C:F7
Up Time	0 Days, 4H:40M:28S	Subnet Mask	255.255.255.0
Current Time	Mon Jan 27 2014 10:16:01 AM	Default Gateway	192.168.100.254
CPU Load	0.56	IP Address (mgmt)	192.168.1.1
Memory	Used: 19.522MB Free: 35.426MB	PSE Voltage	54 Volts
Temperature	50 C	PSE Power	Used: 32.340W Free: 485.410W
Contact	<a href="http://www.phybridge.com/support/polre/">http://www.phybridge.com/support/polre/</a> Tel: 1-888-901-3633 Mon-Fri 8am-6pm ET		

**Ethernet Port Status**

UPLINK			DOWNLINK (4 PORTS UP)																							
F1	G1	M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
F2	G2		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

## 9. Conclusion

These Application Notes describe the configuration steps required for Phybridge PoLRE to interoperate with Avaya UNISlim and SIP IP telephones registered to Avaya Communication Server 1000E 7.6. All feature and serviceability test cases were completed and passed as per **Section 2** with observations explained in **Section 2.2**.

## 10. Additional References

This section references the product documentation relevant to these Application Notes.

Documentation for Avaya products may be found at <http://support.avaya.com>.

### Avaya Communication Server 1000E

- 1) *Communication Server 1000E Overview, Avaya Communication Server 1000*, Release 7.6, Document Number NN43041-110, Issue 06.01, March 2013

Documentation for Phybridge products may be found at <http://phybridge.com>.

### Phybridge PoLRE Switch

- 2) *Phybridge PoLRE Switch and Phylink Adapter Hardware Installation Guide*, Document No. 8005.01.05, Issue 5, July 2012
- 3) *NON POE devices on a PhyAdater or PhyLink*, document 009-011 TS – 017 Version 002, 27 December 2012

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