



Avaya Solution & Interoperability Test Lab

Application notes for Phybridge UniPhyer LB-UA2324 version 0.78P_B07 with Avaya™ Business Communication Manager (BCM) platforms release 5.0 – Issue 1.0

Abstract

These Application Notes describe a solution comprised of Avaya™ Business Communication Manager (BCM) platforms release 5.0 and the Phybridge UniPhyer LB-UA2324 version 0.78P_B07. During the compliance testing, the PhyBridge UniPhyer was able to leverage the existing single-pair telephony wiring to provide dedicated Ethernet voice path and Power over Ethernet to Avaya IP Telephones connected to Avaya BCM platforms. The test of telephony features on Avaya BCM platforms was performed to verify the connectivity between Avaya BCM platforms and the Avaya IP Telephones via the Phybridge UniPhyer.

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 provide detail configurations of Avaya Business Communication Manager platform release 5.0 (hereafter referred to as BCM) and Phybridge UniPhyer LB-UA2324 version 0.78P_B07 (hereafter referred to as UniPhyer). During the compatibility testing session, the UniPhyer provided power and signalling to IEEE 802.3af compliant IP Phones over a single twisted pair. The basic telephony features and serviceability were tested to ensure the connectivity between Avaya BCM system and the Avaya IP phones via the UniPhyer.

1.1. Interoperability Compliance Testing

The focus of this compliant testing is to verify that the UniPhyer was able to interoperate with BCM system. The following interoperability areas were covered:

- PoE functionality of UniPhyer
- The telephony features including: Basic call, Transfer, hold/resume, DTMF
- Serviceability including: ability of UniPhyer to recover from adverse conditions, such as disconnecting and reconnecting the Ethernet cables to the UniPhyer and to the Avaya IP Telephones.

1.2. Support

For technical support on the UniPhyer, please contact Phybridge technical support at:

- Telephone: 1-888-901-3633
- E-mail: richard.kasslack@phybridge.com or support@phybridge.com

2. Reference Configuration

Figure 1 illustrates the test configuration used during the compliant testing event between the Avaya BCM 450 release 5.0 and Phybridge UniPhyer LB-UA2324.

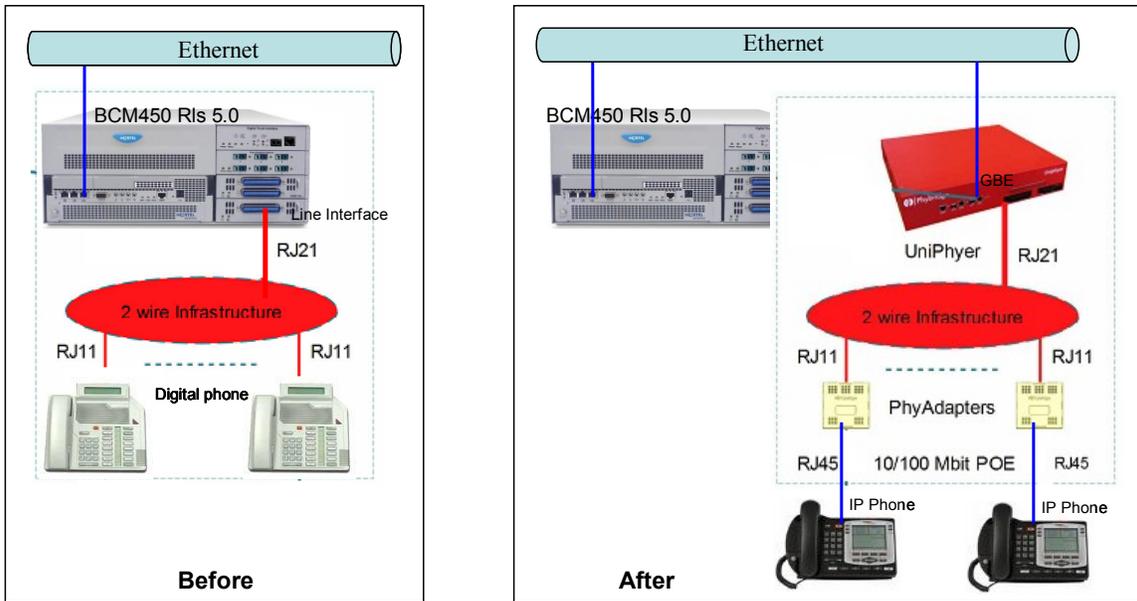


Figure 1: Phybridge UniPhyer Component and Topology

In the test configuration shown in Figure 1(Before), the line connector (RJ21) was disconnected from the BCM line interface and then re-connected to the UniPhyer Line interface. The analog/digital telephones that were connected to the existing RJ11 cabling were replaced by Phybridge Adapters. For each Phybridge Adapter, there was a RJ45 cable connection to an Avaya IP Telephone. Trunk port – Uplink GBE1 of UniPhyer unit was connected to Switch and its IP address was also configured accordingly so that the BCM system and UniPhyer could communicate with each other.

3. Equipment and Software Validated

System	Software/Loadware Version
BCM	<ul style="list-style-type: none"> Model BCM450 R1 version 5.0 System software version 8.0.1.05.329
IP phones	<ul style="list-style-type: none"> 2002 - Model NTDU91 2004 - Model NTDU92 i2004 - Model NTDU82
Phybridge UniPhyer	<ul style="list-style-type: none"> VC 0.78P_B07

Below is the detail of the Phybridge UniPhyer unit that was used in the test:

Query			
Description	Hardware	Firmware	Software
Phybridge 24-port UniPhyer	C	0.78P_B07	0.78P_B07
Model Information	Part Number	HW Revision	S/N
LB-UA2324	GF2CS-GE4A-P801C	A	G098007700

4. IP Phone Configuration on the Avaya BCM 450

This section describes the steps to configure IP Phones on Avaya BCM 450 using Business Element Manager.

4.1. IP Sets registration

Login to BCM by using Business Element Manager, then click on **Resources\Telephony Resources** (left side) and click on **IP Sets** module (right side) to setup all parameters for IP Set registration in **IP Terminal Global Setting** tab as the figure below

The screenshot displays the BCM Element Manager interface for IP Sets registration. The left pane shows the navigation tree with 'Telephony Resources' selected. The main area shows a table of modules and a configuration panel for the 'Internal' module.

Location	Configured Device	Dip Switch	Bus	State	Low	High	Total
Internal	IP Trunks	N/A	N/A	N/A	001	008	
Internal	IP Sets	N/A	N/A	N/A	22221	22441	
Internal	Applications	N/A	N/A	N/A	22300	22399	
Main MBM 1	ASM/ASM+ MBM	All On	10.1	Enabled	20224	22231	
Main MBM 2	DSM16/DSM16+ MBM	All On	20.1	Enabling...	22258	22283	
Main MBM 3	DTM-PRI	All On	30.1	Enabled	009	031	
Main MBM 4	DTM-PRI	All On	40.1	Disabled	032	054	
Expansion 1	None	N/A	N/A	N/A	N/A	N/A	

Buttons: Disable, Enable, Deconfigure..., Configure...

Details for Module: Internal

IP Terminal Global Settings | IP Terminal Details

Enable registration: Default codec: Auto

Enable global registration password: Default jitter buffer: Auto

Global password: [REDACTED] G.729 payload size (ms): 30

Auto-assign DNs: G.723 payload size (ms): 30

Play DTMF-tone: G.711 payload size (ms): 30

Advertisement/Logo: AVAYA BCM

Figure 2: Configuration of IP Sets registration on Avaya BCM release 5.0

4.2. Configure DN length and range (optional)

Login to BCM by using Business Element Manager then click on **Telephony\Dialing Plan\General** (left side) and then configure DN length and change DN range at the right side as shown in the figure below. Please note that the old dialing plan will be updated after this step.

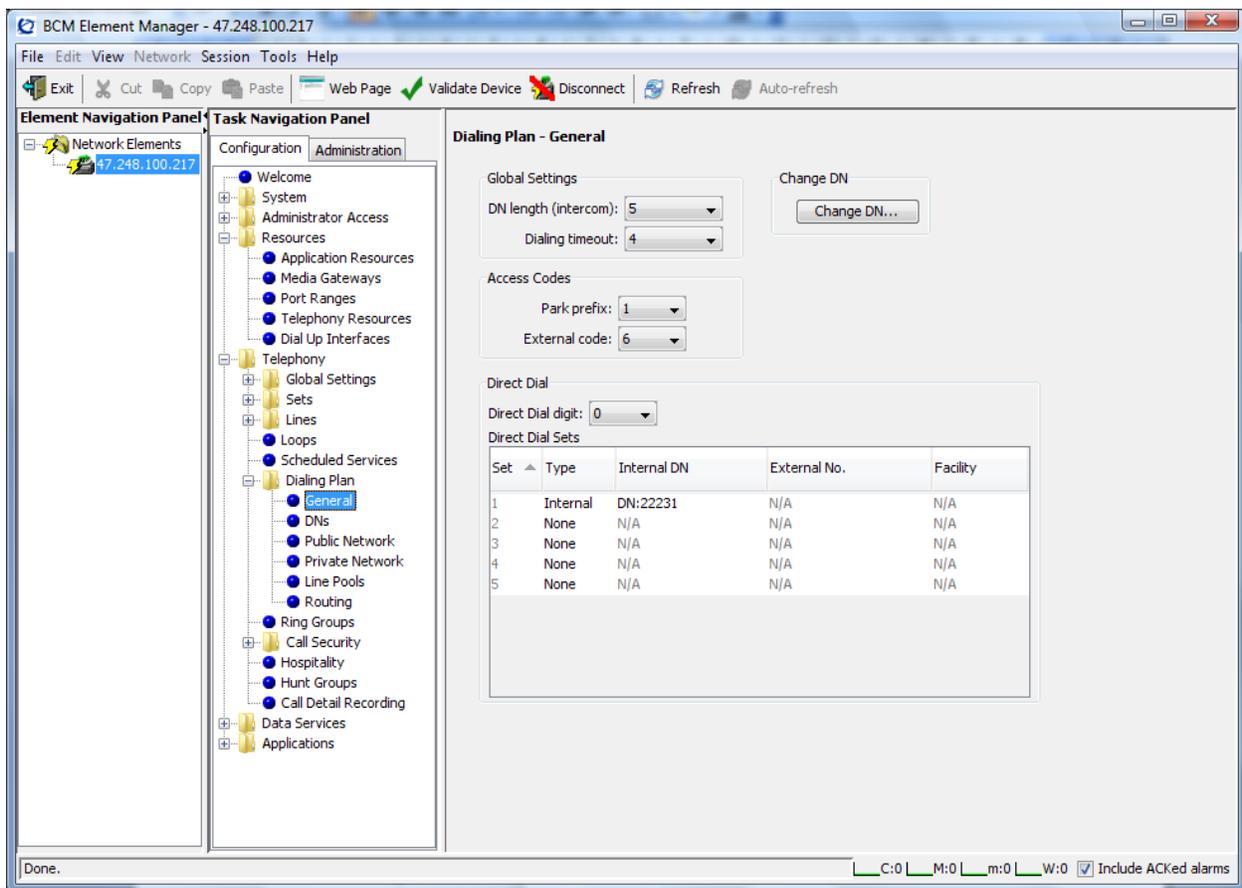


Figure 3: Configure dialing plan – DN length – DN range

4.3. Configure IP Telephones and register to Avaya BCM

Configure IP sets with the following parameters:

- IP address
- S1/ S2 IP: IP address of Avaya BCM
- Port: 7000

Reboot the IP Telephone and then a prompt will appear to ask for password: enter the password that was configured at the first step. After successful registration, one DN will be assigned to this IP Telephone automatically. If a user wants to re-use the old DN, it will need to be configured manually.

4.4. Check IP sets status.

After installation of the UniPhyer, each analog telephone or digital telephone was replaced by an Avaya IP Telephone. This section describes how to check the status of new IP Telephone.

Login to BCM by using Business Element Manager then click on **Telephony\Sets\Active Sets** (left side) and then look for the DN of the set at the right side tab. See the figure below for more detail. The DN can be changed here if necessary.

The screenshot displays the BCM Element Manager interface. On the left, the 'Element Navigation Panel' shows a tree structure under 'Telephony' > 'Sets' > 'Active Sets'. The 'Active Sets' section is selected. The main area shows a table of Active Sets with the following data:

DN	Model	Name	Port	Pub. OLI	Priv. OLI	Fwd No Answer	Fwd Delay
22221	1140E/2004/2007/2050/221x	22221	0210				N/A
22222	1140E/2004/2007/2050/221x	22222	0201				N/A
22223	1140E/2004/2007/2050/221x	22223	0209	4222223			N/A
22225	Analog	22225	1002				N/A
22226	Analog	22226	1003				N/A
22227	Analog	22227	1004				N/A
22228	Analog	22228	1005	4222228		22301	4
22229	Analog	22229	1006				N/A
22230	Analog	22230	1007				N/A
22231	Analog	22231	1001			22301	3
22254	1140E/2004/2007/2050/221x	22254	0211				N/A
22255	1140E/2004/2007/2050/221x	chau	0202				N/A
22259	1140E/2004/2007/2050/221x	dat	0204				N/A
22260	1140E/2004/2007/2050/221x	22260	0212				N/A
22261	1140E/2004/2007/2050/221x	22261	0205				N/A
22441	1120E/2002	22441	0203				N/A

Below the table, the 'Details for DN: 22221' section shows the 'Assigned Lines' table:

Line	Appearance Type	Appearances	Caller ID Set	Vmsg Set	Priv. Received #
354	AppR&Ring		1		22221

Figure 4: Avaya IP Telephone connected to BCM.

5. Phybridge UniPhyer installation and configuration

This section describes the steps to configure the UniPhyer LB-UA2324.

5.1. Phybridge UniPhyer installation

Here is a summary of UniPhyer and PhyAdapter Installation.

- Step 1: Mount the system into the desired location of a rack, wall or table surface.
- Step 2: Connect optional chassis Ground, if required.
- Step 3: Turn the power switch in 0 (OFF) position.
- Step 4: Connect the AC cable between UniPhyer and the 100-240 VAC power source.
After executing the previous procedures, please check the cable connection, robustness and correctness before turning on the power supply.
- Step 5: Turn on Power to UniPhyer; switch is at rear of chassis.
- Step 6: Insure all legacy phones and PBX equipment are removed from the two wire infrastructure to be used by the UniPhyer.
- Step 7: Connect Line Interfaces – prepare RJ21 connection to two wire infrastructure; Connect to UniPhyer to provide connection to PhyAdapters and IP Phones/devices.
- Step 8: Connect Trunk port – Uplink GBE1 (copper or fiber) to IP PBX or Switch.
- Step 9: Optional: connect MGMT interface to PC/network for additional custom configuration or monitoring.
- Step 10: Install PhyAdapters at RJ11 jack outputs of two wire infrastructure and connect IP Phone/device to the RJ45 connector

For additional details see [1].

5.2. Phybridge UniPhyer Configuration

This section describes how to configure the IP address of the Trunk port – Uplink GBE1 accordingly so that UniPhyer can reach to BCM system.

Users can access the UniPhyer via Ethernet by connecting a PC to MGMT Port.

- The default out-of-band MGMT IP address is 192.168.1.1.
 - + Default User is admin
 - + Default password is admin
- Users can then access UniPhyer via Web Configuration Tool or CLI via telnet on port 23.

Here are the steps to configure IP address of GBE port via Web Configuration Tool:

Step 1: Launch the Web Configuration Tool and then login with default user/password.



The screenshot shows the login page for UniPhyer. At the top, there is the Phybridge logo and the text 'UniPhyer'. Below this is a light blue section titled 'Web Interface Login'. It contains a 'Username:' field, a 'Password:' field, and a 'Sign in' button. At the bottom of this section, there is a list of user levels:

- Level 1: SuperUser, R/W Management all
- Level 2: Engineer, R/W (Disabled from User Account)
- Level 3: Guest, Read only

Figure 5 – Access UniPhyer via Web Configuration Tool

Step 2: Administer board IP:

In the subsequent screen, select **System > Board IP Setup** to display the Board IP Setup screen. Modify the IP Address and Subnet Mask fields under the GBE (In Band) to match the network configuration and then click the Modify button to apply the change. Please note the new settings have not saved to flash memory yet, need to save this before restarting. Please also note that the MGMT (Out Band) configuration is optional, and needs to be on a different subnet from the GBE (In Band) if used. See the figure below for more information:

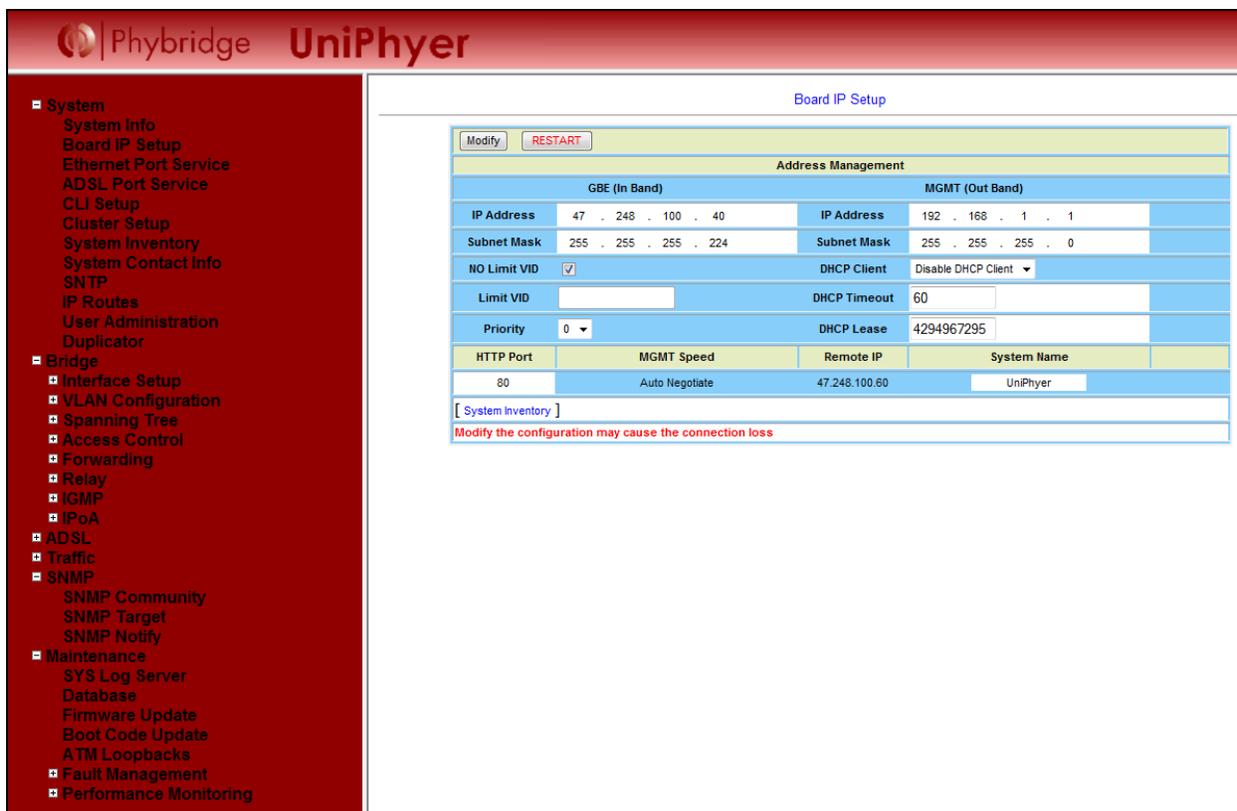


Figure 6 – Phybridge UniPhyer - Administer board IP

Step 3: Save new settings to flash memory before RESTART:

In the subsequent screen, click on maintenance > Database to show Database Configuration. Click on DB Config, from the drop-down list and select (D) “Save Running Config to Flash”.

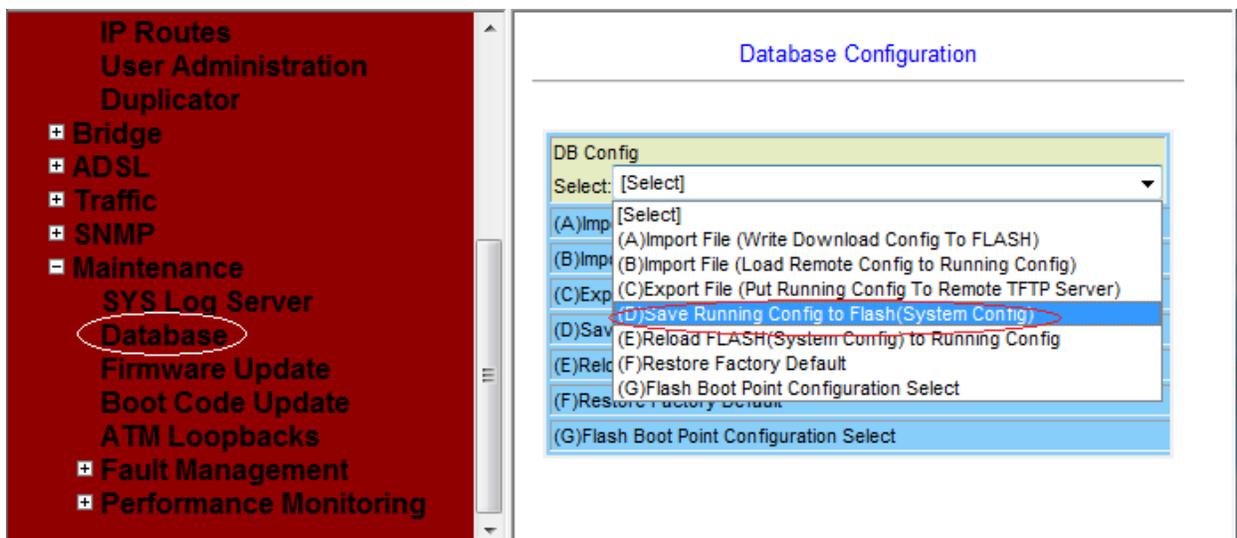


Figure 7 – Save new settings to Flash Memory.

At the “Write flash at” drop down menu, choose the partition option to save the information to. In this case, Partition 1 has been used. Then click on Write_Running button to save the information. Wait for memory write success message.

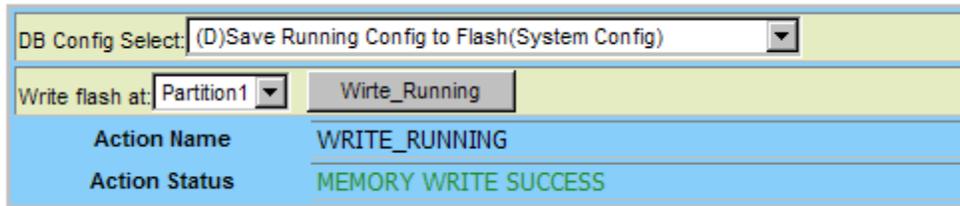


Figure 8 – Save new setting to Flash Memory successful.

Step 4: UniPhyer can be restarted.

6. General Test Approach and Test Results

The focus of this interoperability compliance testing was primarily to verify the BCM system and Avaya IP Telephones connected via the Phybridge UniPhyer can function seamlessly. The test cases were executed manually.

6.1. General test approach

The general test approach was to integrate the UniPhyer into Avaya BCM system. The UniPhyer was able to re-use the two wire infrastructure to provide power and signalling for Avaya IP Telephones. The main objectives were to verify the following:

- PoE functionality of UniPhyer:
 - Power On/Off of the phones along with some signalling transport.
 - Multiple phones are powered at the same time by using the Phybridge UniPhyer.
- The basic telephony features on Avaya BCM platforms.
 - Call establishment among IP Telephones,
 - Basic call operations: Hold/ Retrieve, Transfer, DTMF.
- Performance tests:
 - Only tested with 3 ports.
 - Testing is performed with twisted-pair cables with distances up to 1200ft
- Serviceability testing
 - Power On/Off of UniPhyer unit.
 - Unplug – re-plug the R21 Amphenol connector from UniPhyer Line Interface
 - Unplug – re-plug the IP Telephone cable
 - Unplug – re-plug the single twisted pair cable from PhyAdapter.

6.2. Test Results

The objectives outlined in section 6.1 were verified and met. All tests were executed and passed. The following observations were noted during the compliance test:

1. Max Capacity was not tested with all UniPhyer ports, only with 3 ports. Two lengths of 2 wire cable were used, 20 and 1200 feet in length, to connect Uniphyer to the Phyadapter. Only one 1200 feet twisted-pair cable was used for this testing.
2. The Avaya IP PHONE 2007 was working correctly with the 20 feet length cable. At the 1200 feet in length Avaya IP PHONE 2007 locks up when a user starts to dial a number to call out or when there is an incoming call. Due to the large LCD screen on this set, the power dissipation and signal attenuation were the cause of the failure at 1200 feet cable length. Because of that the IP PHONE 2007 may not be functional beyond 20 feet in length.

7. Verification Steps

This section provides some steps that can be followed to verify the configuration of Avaya BCM and the Phybridge UniPhyer.

7.1. Verify Avaya BCM - IP Telephones status

From the BCM Element Manager web interface, select Administration tab > Utilities > BCM Monitor > click "Launch BCM Monitor" button (enter user password if any) > Click on IP Devices tab to verify that all IP Phones connected via the Phybridge UniPhyer registered successfully to Avaya BCM as shown below:

The screenshot shows the BCM Element Manager web interface. The main window is titled "BCM Monitor - BCM450". The interface includes a "Launch BCM Monitor" button and a "BCM Monitor" window with the following sections:

- IP Clients:** Used licenses: 9 of 300
- 120xx Sets:** Enabled: 9, Connected: 3, Active (on call): 0
- Wireless Sets:** Enabled: 0, Connected: 0, Active (on call): 0
- IP Trunks:** Used licenses: 130 of 260, Active (on call): 0, MCDN over IP: Enabled
- IP Set Details Table:**

DN	Type	IP:Port	RTP Session	Info
22222	1140E			offline since Tue Apr 6 17:39:20 2010
22223	2007			offline since Mon Apr 5 14:55:47 2010
22224	2004_p1	47.248.100.54:5000		ONLINE since Wed Apr 14 09:37:15 2010
22254	2050_p2			did not connect since last reboot
22255	2050_p2			did not connect since last reboot
22258	2004_p1	47.248.100.51:5000		ONLINE since Wed Apr 14 10:13:13 2010
22260	2050_p2			offline since Tue Apr 13 11:16:20 2010
22261	2050_p2			offline since Tue Apr 6 10:10:53 2010
22441	2002_p2	47.248.100.36:5000		ONLINE since Wed Apr 14 09:38:29 2010

7.2. Verify Phybridge UniPhyer

From the Phybridge UniPhyer web interface, select System > ADSL Port Service. The ADSL Port Service screen is displayed. Verify that the “Current Status” for all physically connected voice ports is in the ON state, as shown below.

The screenshot displays the 'ADSL Port Service' configuration page in the Phybridge UniPhyer web interface. The page features a navigation menu on the left and a main content area with a table of ports. The table has the following data:

Select	Port	Admin Status	Current Status	Service Profile	Spectrum Profile	TCA Profile
<input checked="" type="radio"/>	1	ON	ON	2	2	2
<input type="radio"/>	2	ON	ON	2	2	2
<input type="radio"/>	3	ON	ON	2	2	2
<input type="radio"/>	4	ON	OFF	2	2	2
<input type="radio"/>	5	ON	OFF	2	2	2
<input type="radio"/>	6	ON	OFF	2	2	2
<input type="radio"/>	7	ON	OFF	2	2	2
<input type="radio"/>	8	ON	OFF	2	2	2
<input type="radio"/>	9	ON	OFF	2	2	2
<input type="radio"/>	10	ON	OFF	2	2	2
<input type="radio"/>	11	ON	OFF	2	2	2
<input type="radio"/>	12	ON	OFF	2	2	2

8. Conclusion

All of the executed test cases have passed and met the objectives outlined in **Section 6.1**, with some limitations/exceptions outlined in **Section 6.2**.

9. Additional References

Product documentation for Avaya products may be found at:
<http://support.nortel.com/go/main.jsp>

Product information for Phybridge UniPhyer products can be found at
<http://www.phybridge.com/ip-phone-support.aspx>

[1] Phybridge LB-UA2324 – 24 Port UniPhyer Hardware Installation and User Guide.

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