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Application notes for Phybridge UniPhyer LB-UA2324 version 0.78P_B07 with Avaya™ Communication Server 1000 Release 6.0R – Issue 1.0

Abstract

These Application Notes describe a solution comprised of Avaya™ Communication Server 1000 Release 6.0R 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 Communication Server 1000 system. The test of telephony features on Avaya Communication Server 1000 was performed to verify the connectivity between Avaya Communication Server 1000 system 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 Communication Server 1000 Release 6.0R (hereafter referred to as CS1000) and Phybridge UniPhyer LB-UA2324 version 0.78P_B07 (hereafter referred to as Uniphyer). During the compliance testing session, the Phybridge UniPhyer LB-UA2324 provided power and signalling to Avaya IP Telephones over a single twisted pair. The basic telephony features were tested based on the connectivity between Avaya Communication Server 1000 system and the Avaya IP Telephones via the Phybridge UniPhyer.

1.1. Interoperability Compliance Testing

The focus of this compliant testing is to verify that the Phybridge UniPhyer was able to interoperate with Avaya CS1000 systems. 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 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 CS1000 release 6.0 and Phybridge UniPhyer LB-UA2324.
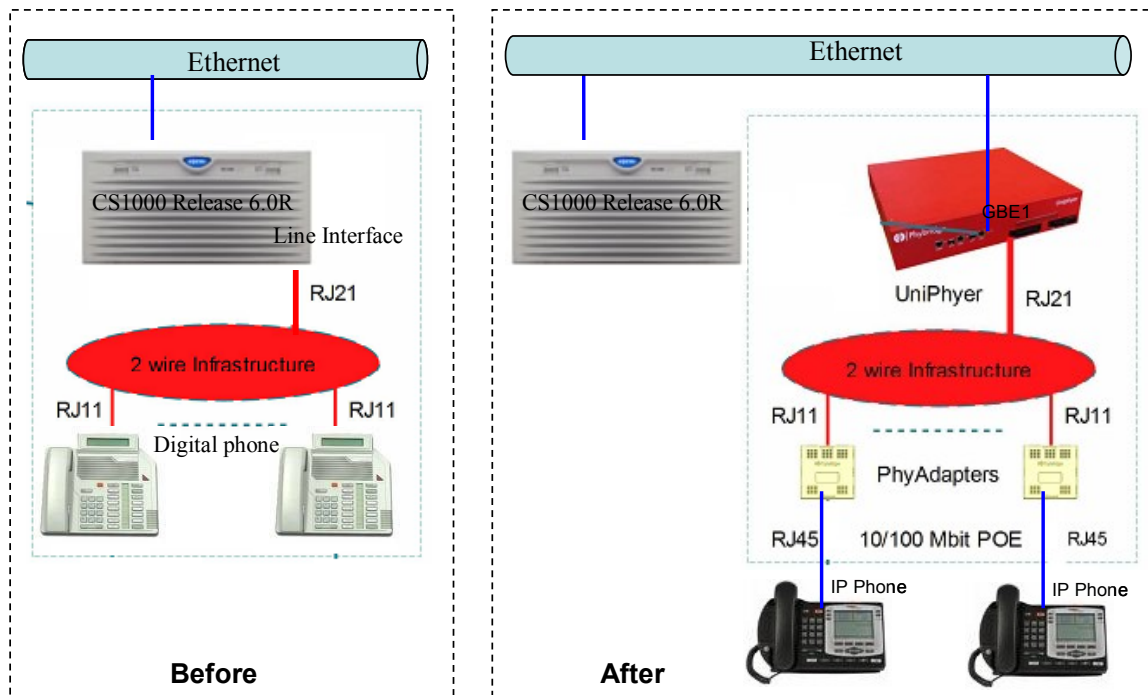
Figure 1: Phybridge UniPhyer Component and Topology

In the test configuration shown in Figure 1(Before), the line connector (RJ21) was disconnected from CS1000 line card interface and then re-connected to 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 CS1000 system and UniPhyer could communicate with each other.

3. Equipment and Software Validated

System	Software/Loadware Version
CS1000	• Call Server (CPPM): 6.00R + latest deplist • Signalling Server (CPPM): 6.00.18 + latest deplist
IP Telephones	• 2007 - Model NTDU96 • 1234 - Model NTYS20 • 1140E - Model NTYS05 • 2004 – Model NTDU82
Phybridge	• 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 Telephone Configuration on the Avaya CS1000

This section describes the steps to configure IP Telephones on the Avaya CS1000 system.
If a user has an existing CS1000 system and the system is working fine with VoIP Telephones.
Please skip sections 4.1 and 4.2.

4.1. Node configuration

- Launch UCM and login with username and password.
- Click on an Element to launch CS1000 Element Manager for configuring a Node.
- After launched CS1000 Element Manager, Click on **IP Network** > **Nodes:** > **Servers, Media Cards** and then click on **Add** button (Figure 2).
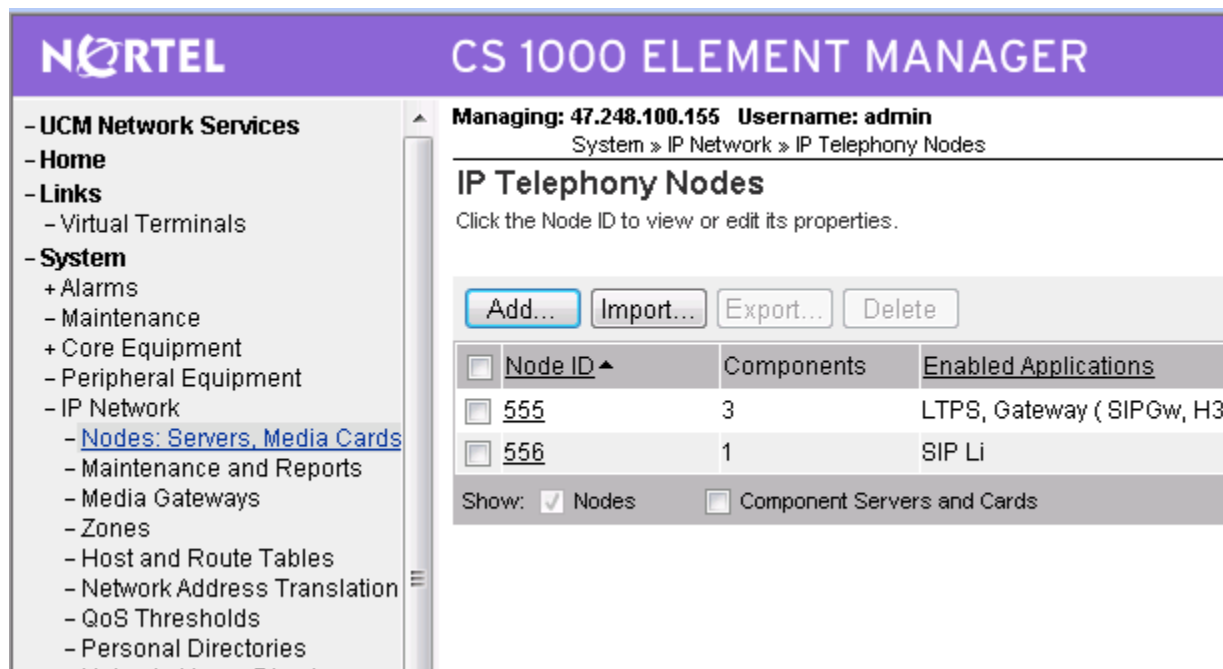

Figure 2 – Add a node.

- Input Node ID, Node IP, select Unistim Line Terminal Proxy and Virtual Trunk Gateway as shown in Figure 3.

Figure 3 – Node Configuration.

- Click Next and then configure remaining parameters to complete adding the new IP Telephone.

4.2. Create Customer and TN resources on CS1000.

To create a customer, using ld 15 do as follows:

```
- >LD 15
CDB000
MEM AVAIL: (U/P): 102941336    USED U P: 523789 169816    TOT: 103634941
DISK SPACE NEEDED: 300 KBYTES
REQ: NEW
TYPE: CDB
CUST 0
AML_DATA
ANI_DATA
  ANAT 12345
  ANLD 12
  PANI
ATT_DATA
AWU_DATA
CAS_DATA
CCS_DATA
CDR_DATA
FCR_DATA
FFC_DATA
FTR_DATA
ICP_DATA
IMS_DATA
INT_DATA
LDN_DATA
```

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PhybridgeCS1000

```
            MON_DATA
            MPO_DATA
            NET_DATA
            NIT_DATA
            OAS_DATA
            PWD_DATA
            RDR_DATA
            ROA_DATA
            SLS_DATA
            TIM_DATA
            TST_DATA

            MEM AVAIL: (U/P): 102939434    USED U P: 524133 171374    TOT: 103634941
            DISK SPACE NEEDED: 303 KBYTES
            REQ: ****
            OVL000
```

To have DN resources, using ld 97 to create virtual loop do as follows:

```
            >ld 97
            SCSYS000
            MEM AVAIL: (U/P): 102939434    USED U P: 524133 171374    TOT: 103634941
            DISK SPACE NEEDED: 303 KBYTES
            REQ  chg
            TYPE supl
            SUPL v96
            WRAP UP SUPL 96  (NEW)  ..OK


            MEM AVAIL: (U/P): 102932650    USED U P: 530597 171694    TOT: 103634941
            DISK SPACE NEEDED: 304 KBYTES
            REQ
```

4.3. IP Telephone Creation

To create an IP Telephone on CS1000, please use overlay ld 11 as follows:

```
            >ld 11
            SL1000
            MEM AVAIL: (U/P): 102941621    USED U P: 523637 169683    TOT: 103634941
            DISK SPACE NEEDED: 299 KBYTES
            TNS              AVAIL: 32271    USED:  496    TOT: 32767

            REQ: new
            TYPE: 2004p2
            TN   96 0 0 6   ← created in section 4.2
            DES  IPPhone
            CUST 0   ← created in section 4.2
            NUID
            NHTN
            KEM
            ZONE 0 ← default zone is 0.
            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 55660
           MARP
           CPND
           VMB
          KEY

          MEM AVAIL: (U/P): 102941301    USED U P: 523789 169851    TOT: 103634941
          DISK SPACE NEEDED: 300 KBYTES
          TNS               AVAIL: 32270    USED:   497    TOT: 32767

          REQ:
```

4.4. Configure IP Telephones and register to Avaya CS1000 system

Configure IP Telephones with the following parameters:
- IP address
- S1/ S2 IP: Node IP that was configured in section 4.1.
- Port: 4100

Reboot the IP Telephones. When booting up, a prompt will be appear to ask Node ID and TN: enter Node ID that was configured in the section 4.1 and TN that was created in the section 4.3.

5. Phybridge UniPhyer installation and configuration

This section describes the steps to configure the Phybridge 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
           Telephones/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 Telephone/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 CS1000 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.

Figure 4 – 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:
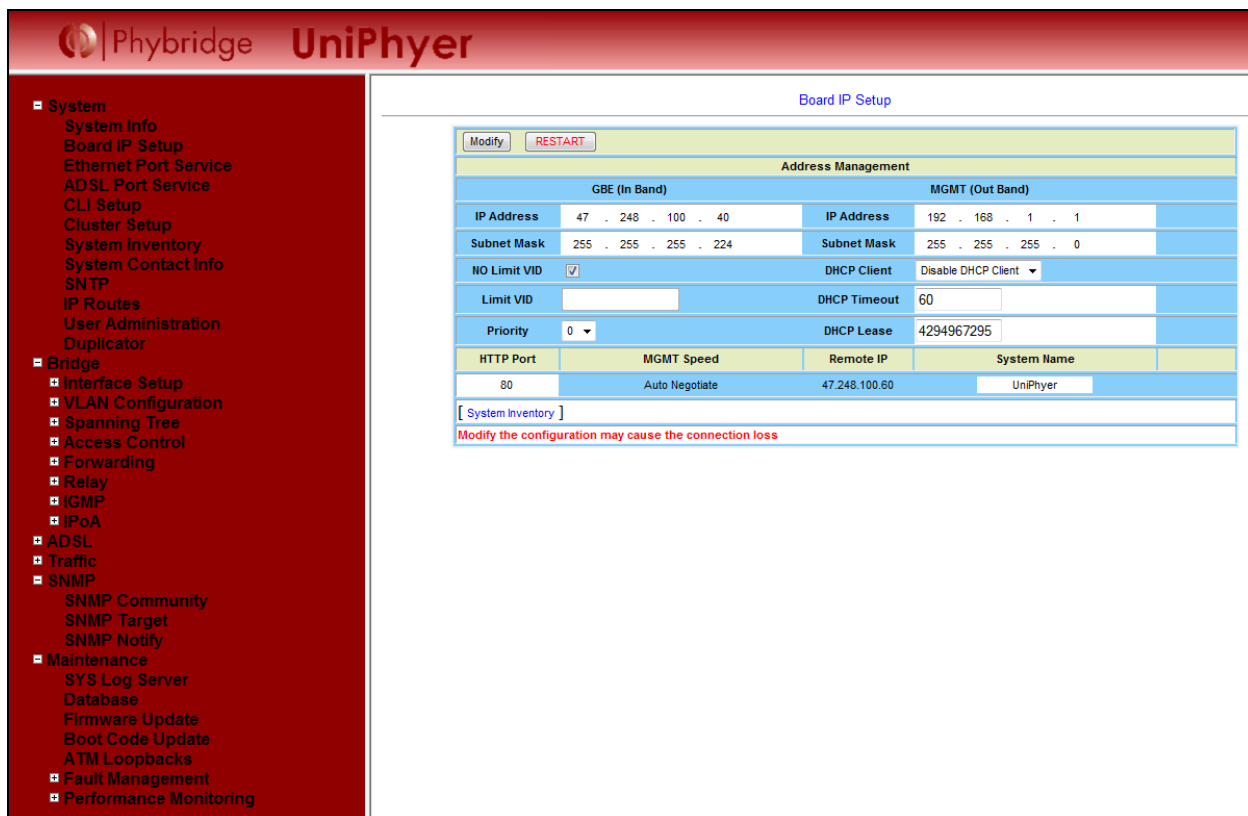
Figure 5 – Phybridge UniPhyer - Administer board IP

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

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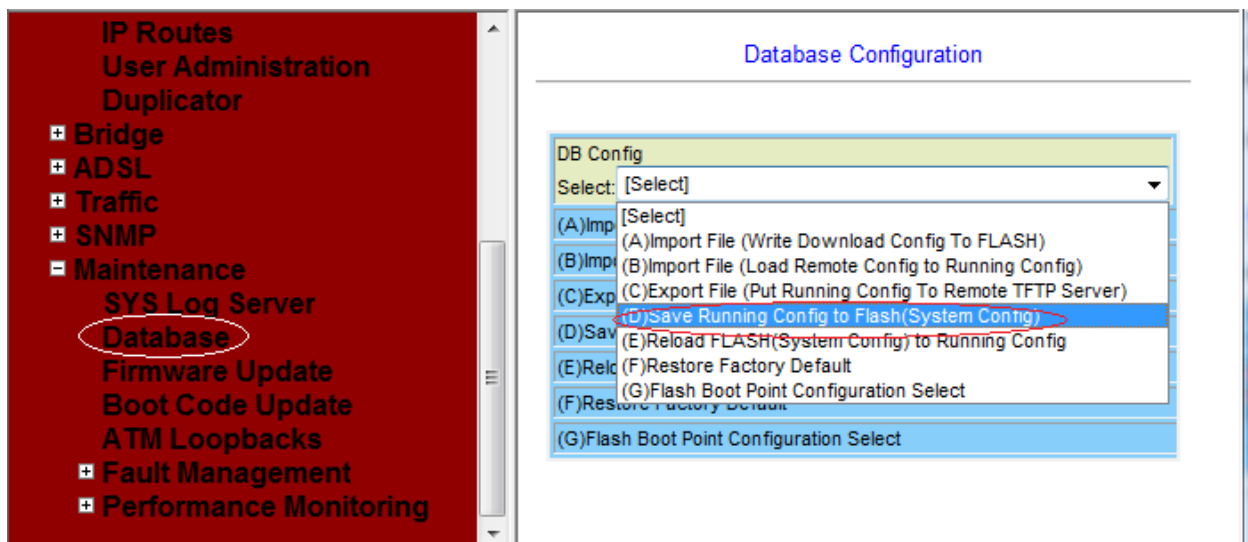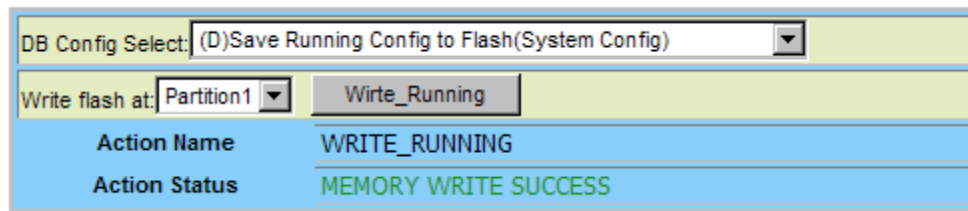Click on DB Config, from the drop-down list and select (D) "Save Running Config to Flash".

Figure 6 – 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 7 – Save new setting to Flash Memory successful.

Step 4: UniPhyer can be restarted now.

6. General Test Approach and Test Results

The focus of this interoperability compliance testing was primarily to verify the CS1000 system and Avaya IP Telephones connected via the 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 CS1000 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:
  - o Power On/Off of the phones along with some signalling transport.
  - o Multiple phones are powered at the same time by using the Phybridge UniPhyer.
- The basic telephony features on Avaya CS1000 system.
  - o Call establishment among IP Telephones
  - o Basic call operations: Hold/ Retrieve, Transfer, DTMF.
- Performance tests:
  - o Only tested with 3 ports.
  - o Testing is performed with twisted-pair cables with distances up to 1200ft
- Serviceability testing
  - o Power On/Off of UniPhyer unit.
  - o Unplug – re-plug the R21 Amphenol connector from UniPhyer Line Interface
  - o Unplug – re-plug the IP Telephone cable
  - o 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 CS1000 system and the Phybridge UniPhyer.

7.1. Verify Avaya CS1000 - IP Telephones status.

Login to Signalling Server and run the command "isetShow" to make sure the IP phones have registered to CS1000 system successfully.

```
[admin@sipt ~]$ isetShow

=== TPS ===

Set Information
---------------
  IP Address     NAT  Model Name              Type   RegType State     Up Time       Set-TN
Regd-TN        HWID       FWVsn  UNIStimVsn SrcPort DstPort RFC2833PTTx
------------------ ---- ------------------------------- ---------- ------- ----------- -------------- ------------ ------------ -
-------------------- ------- ---------- ------- ------- ------------
47.248.100.55        IP Phone 2004 Phase 2      2004P2   Regular online      1 03:39:15 096-00-
00-06 096-00-00-06 18-000ae46f05f1-6602   DCJ    3.0    5100   5000   255
47.248.100.43        IP Phone 1140E             1140     Regular online      0 02:57:41 100-00-05-
02 100-00-05-02 18-0016ca0081fd-6625   C6O    3.0    5100   5000   255

Total sets = 2
[admin@sipt ~]$
```

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.

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.