# AVAYA

**Avaya Solution & Interoperability Test Lab**

# Application Notes for Configuring Avaya Communication Server 1000E R7.5 with Phoneware CallBill 3.0 Using a RS232 Serial Connection - Issue 1.0

## Abstract

These Application Notes describe the configuration steps for provisioning Avaya Communication Server 1000E R7.5 and Phoneware CallBill 3.0. The Phoneware CallBill will connect to the Avaya Communication Server 1000E using a RS232 serial connection. The Call Detailed Reporting feature on the Avaya Communication Server 1000E will be enabled.

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

Phoneware CallBill 3.0 is a Windows-based call accounting software application. Phoneware CallBill collects call records from a telephone system and stores them in a database. Phoneware CallBill Reporting allows the user to use this data to identify and control call costs and traffic activity with reporting options. Phoneware CallBill 3.0 comprises of four main modules. The Logger Module collects call records from the Avaya Communication Server 1000E (CS1000E) and stores them locally until the Record Processor Module retrieves them. Once the Record Processor Module has retrieved the call records, they are archived locally on the Logger Module PC. The Record Processor Module periodically retrieves call records from the Logger Module and stores these call records in a Phoneware CallBill site database. The cost of each call is calculated during processing and is based on tariffs applicable to the site from which the records were retrieved. The Record Processor can be configured to periodically retrieve call records from multiple sites. The Phoneware CallBill Reports Module allows the user to retrieve information from the Phoneware CallBill databases by running reports. Reports can either be run ad hoc, or they can be attached to a schedule, which will run them automatically when the schedule activates. The Report Design Module allows users to create/modify individual report designs to provide reports in the required format. Each Report is made up of one or more Modules, each Module is made up of one or more Sections, and each Section comprises a selection of Fields, which is chosen from the list of available fields.

# 2. General Test Approach and Test Results

The interoperability compliance test included both feature and functionality testing. The feature and functionality testing focused on verifying that Call Detailed Records are collected by CallBill and received in the format as generated by the CS1000E. The CallBill Logger module connects to a RS232 serial port on the CS1000E.

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

The testing included:
- Verification of connectivity between the CallBill and CS1000E using a RS232 serial connection.
- Verification that Call Detailed Records were collected as output from the CS1000E.

## 2.2. Test Results

Tests were performed to insure full interoperability between CallBill and the CS1000E. The tests were all functional in nature and performance testing was not included. All the test cases passed successfully.

## 2.3. Support

Technical support can be obtained for Phoneware Ltd. products as follows:

- E-mail: *support@phoneware.ie*
- Ireland: 0404 68711
- UK Freefone: 0800 169 8618
- USA\Canada Toll Free: 1800 660 9248
- International: +353 404 68711

# 3. Reference Configuration

**Figure 1** illustrates the network diagram configuration used during compliance testing The CS1000E R7.5 runs on the Common Processor Pentium Mobile (CPPM) server as a co-resident configuration. The Call Detailed Reporting (CDR) connection method is a RS232 serial cable connecting a CS1000E TTY port to the CallBill PC comm. port. The CDR output on the CS1000E is configured as Format CDR (FCDR= New).

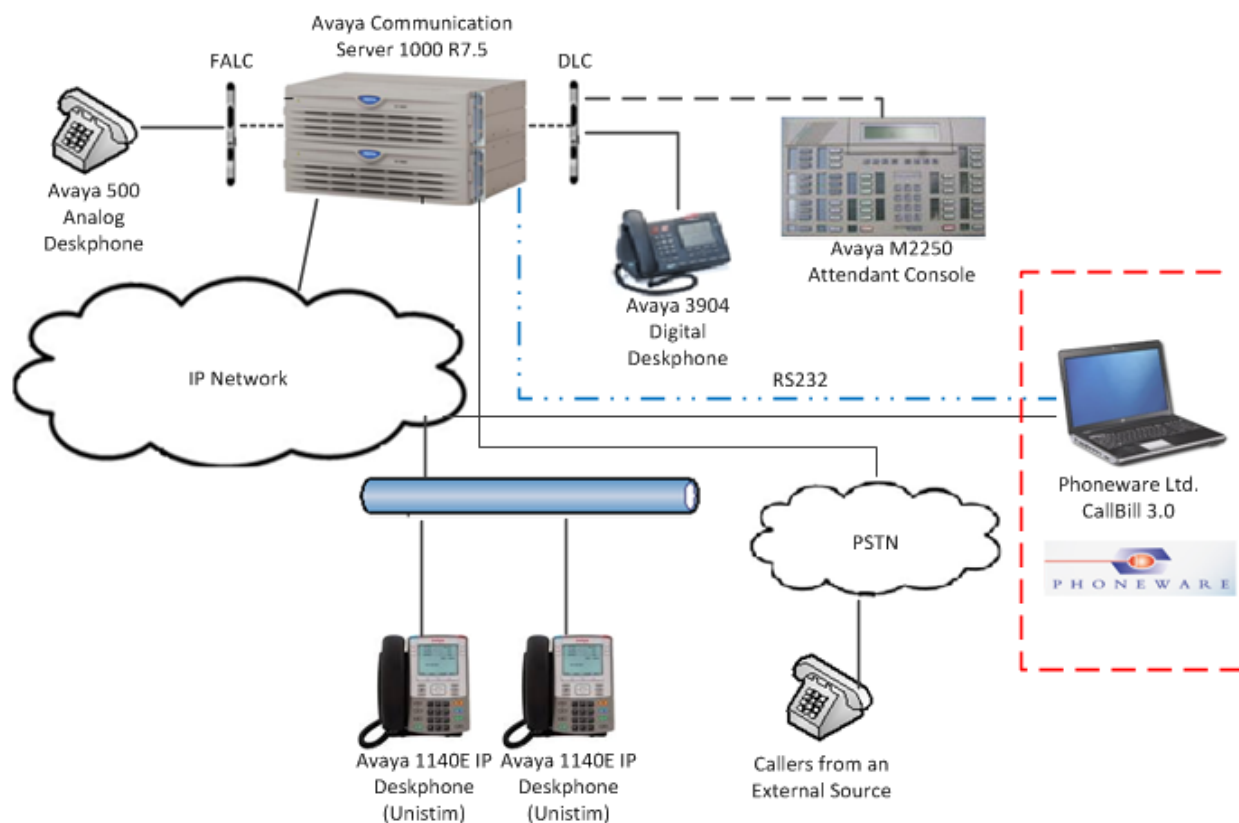**Note:** The CS1000E was configured with A-Law Companding.



**Figure 1: Avaya Communication Server 1000E R7.5 with Phoneware Ltd. CallBill 3.0 Reference Configuration**

# 4. Equipment and Software Validated

The hardware and associated software used in the compliance testing is listed below.

| Equipment | Software Version |
|---|---|
| Avaya Communication Server 1000E CPPM | Avaya Communication Server 1000E R7.5 SP1 |
| CP-PM CoRes | HW NTDW61 |
| Avaya Communication Server 1000E Media Gateway | HW NTDW60 |
| Avaya PRI Card | NTBK50 |
| Avaya Flexible Analog Line Card | NT5K02QC |
| Avaya Digital Line Card | NT8D02 |
| Avaya 3904 Digital set | F/W 2.4 |
| Avaya 1140E IP set | UNIStim 4.3 |
| Avaya Analog set | NT2N73AA |
| Avaya M2250 Attendant Console | NT6G48AC |
| Phoneware Ltd. CallBill | CallBill Version 3.0 |

**Table 1: Hardware and Software Version Numbers**

**Note:** For a complete list of the patches installed on the CS1000E see **Appendix A**.

# 5. Configure Avaya Communication Server 1000E

Configuration and verification operations on the CS1000E illustrated in this section were all performed using terminal access over a serial link to a Talk To You (TTY) port on the CS1000E using Telnet. The information provided in this section describes the configuration of the CS1000E for this solution. It is implied a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration operations described in this section can be summarized as follows:

- Configuring a TTY port for collecting CDR data
- Configuring CDR Data in the Configuration Data Block
- Configuring CDR Data in the Customer Data Block
- Configuring FTR Data in the Customer Data Block
- Configuring Route Data Block
- Configuring Telephones for CDR options
- Configuring Attendant Consoles for CDR options
- Configuring CDR in the Authorization Data Block

**Note:** In the Telnet screenshots below only the unique prompt inputs are shown. Carriage Return all other prompts to set default values.

## 5.1. Configuring a TTY Port for Collecting CDR Data

The communication between the Communication Server 1000E and the CallBill uses a RS232 serial port. A TTY port needs to be configured on the Communication Server 1000E to support CDR. CallBill monitors the output on this TTY. **USER** needs to be set to **CTY** (Call Detail Recording on Teletype Terminal). In order to configure a new TTY port **LD 17** is used. Subsets of these commands are illustrated below.

**LD 17**

| Prompt | Response | Description |
|--------|----------|-------------|
| > | **LD 17** | Enter Overlay 17 |
| REQ | **CHG** | Change Data |
| TYPE | **ADAN** | Action Device and Number |
| ADAN | **NEW TTY 12** | New I/O device and number |
| CTYP | **MGC** | Card type |
| IPMG | **4 0** | loop and Card |
| PORT | **2** | Port number |
| DNUM | **13** | Device number for I/O ports |
| DES | **CallBill** | Designator |
| BPS | **9600** | Bits per Second |
| BITL | **8** | Data Bit Length |
| STOP | **1** | Number of Stop bits |
| PARY | **NONE** | Parity type |
| FLOW | **NO** | Flow Control |
| USER | **CTY** | Output message type |

## 5.2. Configuring CDR Data in the Configuration Data Block

The Format for Call Detail Recording (**FCDR**) needs to be changed in the CDR Data Block to **NEW.** This is the format that CallBill uses when collecting CDR data**.** Calling Line Identification (**CLID**) also needs to be changed to **YES**. In order to change the CDR data **LD 17** is used. Subsets of these commands are illustrated below.

**LD 17**

| Prompt | Response | Description |
|--------|----------|-------------|
| > | **LD 16** | Enter Overlay 16 |
| REQ | **CHG** | Change Data |
| TYPE | **PARM** | System Parameters |
| CUST | 0 | Customer Number |
| FCDR | **NEW** | Format Type |
| CLID | **YES** | Calling Line Identification |

## 5.3. Configuring CDR Data in the Customer Data Block

CDR needs to be enabled and assigned to the TTY port that was configured in **Section 5.1**. During compliance testing port **12** was used. The Aux Identification (**AXID**) and Output in CDR record (**CDR**) needs to be set to **YES**. In order to change the CDR data **LD 15** is used. Subsets of these commands are illustrated below.

**LD 15**

| Prompt | Response | Description |
|--------|----------|-------------|
| > | **LD 15** | Enter Overlay 15 |
| REQ | **CHG** | Change Data |
| TYPE | **CDR** | Call Detailed Reporting |
| CUST | **0** | Customer Number |
| CDR | **YES** | Call Detailed Reporting |
| AXID | **YES** | Aux Identification |
| PORT | **12** | Port Number assigned to CDR |

## 5.4. Configuring FTR Data in the Customer Data Block

The Time to Answer and Abandoned call records (TTAA) option needs to be set to Allowed. In order to change the FTR data **LD 15** is used. Subsets of these commands are illustrated below.

**LD 15**

| Prompt | Response | Description |
|--------|----------|-------------|
| > | **LD 15** | Enter Overlay 15 |
| REQ | **CHG** | Change Data |
| TYPE | **FTR** | Features and options |
| CUST | **0** | Customer Number |
| OPT | **TTAA** | Time to Answer Abandoned Call Records |

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## 5.5. Configuring Route Data Block

CDR has to be activated on the trunk route to the PSDN and any other routes to other PBX's. During compliance testing route **42** was configured to route calls to and from the PSDN. In order to change the Route data **LD 16** is used. Subsets of these commands are illustrated below.

**LD 16**

| Prompt | Response | Description |
|--------|----------|-------------|
| >**LD** | **16** | Enter Overlay 16 |
| REQ | CHG | Change Data |
| TYPE | **RDB** | Route Data Block |
| CUST | **0** | Customer Number |
| ROUT | **42** | Route Number |
| CDR | **YES** | Call Detail Recording |
| INC | **YES** | CDR records for incoming calls |
| LAST | **YES** | CDR records for redirected calls |
| TTA | **YES** | Time To Answer output in CDR |
| ABAN | **YES** | Abandoned call records for this route |
| CDRB | **YES** | Abandoned call on busy tone records |
| QREC | **NO** | CDR ACD Q initial connection |
| OAL | **YES** | CDR on outgoing calls |
| AIA | **YES** | Answered call Identification Allowed |
| OAN | **YES** | CDR On Answer of outgoing calls |
| OPD | **YES** | Outpulsed Digits in CDR |

## 5.6. Configuring Telephones for Additional CDR Options

Abandoned Call-Time to Answer and Internal CDR record options can be activated on a per set basis by modifying the set Class of Service (CLS). Abandoned call record and Time to Answer (**ABD**) and Internal Call Detail Recording (**ICD**) needs to be set to Allowed. If Charge codes are to be used Key 25 must be used if the phone type is IP. During compliance testing a number of telephone types were used, in the example below an Avaya 1140e IP Deskphone using TN 96-0-0-1 was configured. In order to add CDR options for the phone type 1140 **LD 11** is used. Subsets of these commands are illustrated below.

**LD 11**

| Prompt | Response | Description |
|--------|----------|-------------|
| > | LD 11 | Enter Overlay 11 |
| REQ | **CHG** | Change Data |
| TYPE | **1140** | Phone Type |
| TN | 96 0 0 1 | Terminal Number |
| CUST | **0** | Customer Number |
| CLS | **ABDA ICDA** | Class of Service |
| KEY | **25 CHG** | Charge Account key |

## 5.7. Configuring Attendant Consoles for additional CDR options

If additional CDR record options are to be collected from an Attendant Console the Internal Call Detail Recording (**ICDR**) and Abandoned call record and Time to Answer (**ABDN**) need to be set to Allowed. During compliance testing an Avaya 2250 Attendant Console was used. In the example below TN 4-0-9-3 and the Attendant Number (**ANUM**) 1 was used. In order to add CDR options for the Attendant Console **LD 12** is used. Subsets of these commands are illustrated below.

**LD 12**

```
Prompt            Response          Description
>                 LD 12             Enter Overlay 12
REQ               CHG               Change Data
TYPE              2250              Phone Type
TN                4 0 9 3           Terminal Number
CUST              0                 Customer Number
ANUM              1                 Attendant Number
ICDR              ICDA              Internal Call Detail Recording Allowed
ABAN              ABDA              Abandoned call record and time to
answer Allowed
```

## 5.8. Configuring CDR in the Authorization Data Block

During compliance testing Authorization Codes were used. The Activate CDR for Authcodes (**ACDR**) option must be set to yes. In order to configure the authorization Data Block **LD 88** is used. Subsets of these commands are illustrated below.

**LD 88**

```
Prompt            Response          Description
>                 LD 88             Enter Overlay 88
REQ               CHG               Change Data
TYPE              AUB               Authcode Data Block
CUST              0                 Customer Number
SPWD              ****              Secure Data Password
ALEN              4                 Authcode Length
ACDR              YES               Activate CDR for Authcode
AUTO              NO                Automatically generate Authcodes
```

# 6. Configuring Phoneware CallBill

A number of steps are required to Configure CallBill to interoperate with CS1000E.The Logger Module connects to a RS232 serial port on the CS1000E. The Record Processor Module retrieves the CDR Data from the Logger Module. During compliance testing The Record Processor Module Co-Resided with the Logger Module. It is implied that CallBill 3.0 software is already installed. The configuration operations described in this section can be summarized as follows:

- Configuring Logger Module Telephone System Connection Settings

- Configuring Record Processor Module

## 6.1. Configuring Logger Module Telephone System Connection Settings

To Configure the Telephone System Connection Settings start the CallBill Logger Module, a splash screen appears (see screen shot below) informing that CallBill will start logging in 10 seconds. Click the Cancel button to cancel logging and allow configuration of the telephone system connection settings.
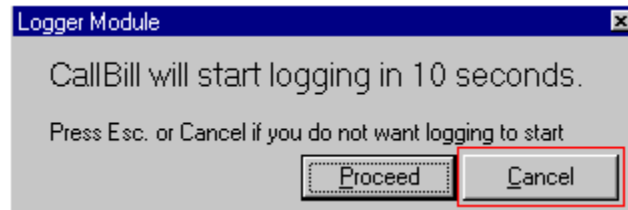


To configure the Logger Module Telephone System Connection Settings choose **Connection** →**Telephone System** from the **Logger Module** menu bar as shown below.

Choose the Settings Tab, the screen shot below shows the setting used during compliance testing and are similar to those in **Section 5.1**. Fill in the following and click the **Save** button to save.

- **Comm Port**      **Comm Port 4**
- **Baud Rate**      **9600**
- **Parity**            **None**
- **Data Bits**       **8**
- **Stop Bits**       **1**
- **Handshaking**   **None** (same as Flow in **Section 5.1**)
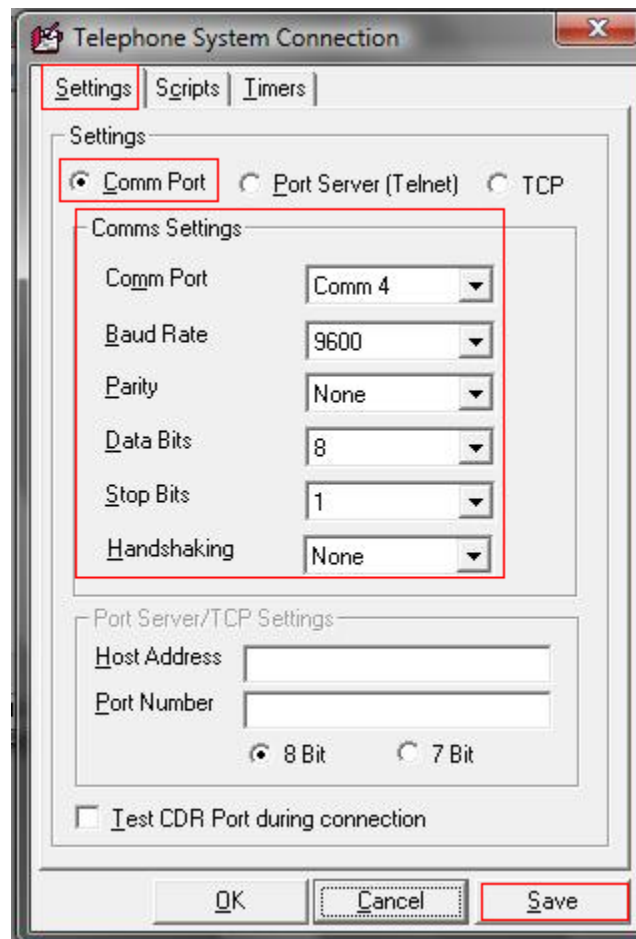
## 6.2. Configuring Record Processor Module

The Record Processor Module retrieves the call records from the Logger Module. During compliance testing the Record Processor Module was installed on the same PC as the Logger Module. Start the CallBill Record Processor Module and use the CallBill Record Processor Site window (not shown) and configure the following:

- **Record Format**            Choose **AVAYA** from the drop down box.

Choose the **General** Tab
- **Retrieve Call Records**    Choose **Transfer Module** from the drop down box.
- **Same PC/Network**          Click the radio button
- **Port**                     Enter **1001**

Click the **Save** button to save the new settings.

# 7. Verification Steps

This section provides the tests that can be performed to verify correct configuration of the CS1000E and CallBill.

## 7.1. Verify Avaya Communication Server 1000E TTY

The following step can ensure the TTY is enabled for Call Detail Recording that was setup in **Section 5.1.** Use the **stat** command in **LD 37**.

**LD 37**

```
Prompt            Response           Description
>LD 37                               Enter Overlay 37
REQ               STAT TTY 12        Stat TTY number
```
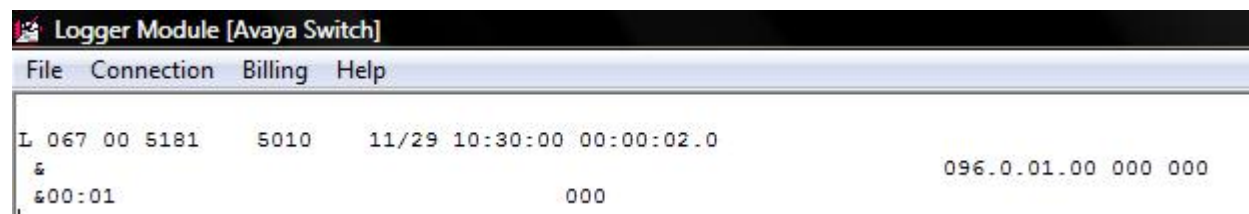
**Example:**

```
REQ: stat TTY 12
TTY 12 : ENBL (MGC 4 0) DES Callbill
```

## 7.2. Verify CallBill is collecting Call Records

To ensure that the Logger Module is retrieving Call Records make some calls on the CS1000E, then open the Logger Module, choose **Billing** from the **Logger Module** menu bar followed by **Start Call Billing**.
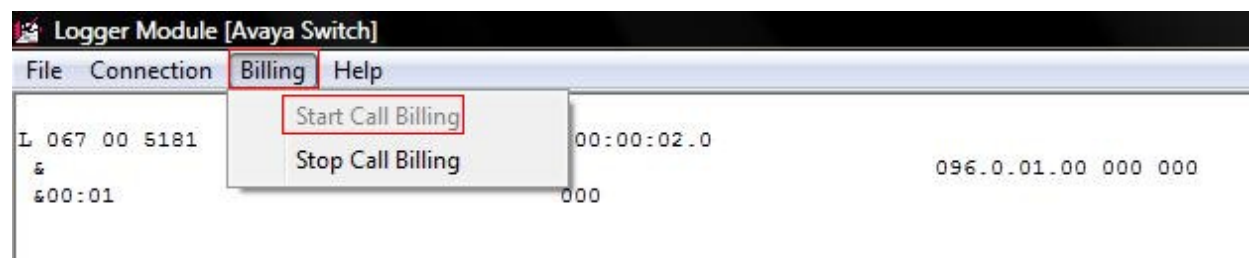
Verify that something similar to the following is presented.

# 8. Conclusion

These Application Notes describe the configuration steps required for Avaya Communication Server 1000E R7.5 to successfully interoperate with Phoneware CallBill 3.0 using a RS232 serial connection. Phoneware CallBill 3.0 is considered compliant with the Avaya Communication Server R7.5. All of the executed test cases have passed and met the objectives outlined in **Section 2.2**.

# 9. Additional References

This section references the Avaya and Phoneware Ltd. documentation that is relevant to these Application Notes. Product documentation for Avaya products may be found at *http://support.avaya.com*.

[1] *Software Input Output Reference — Administration, Avaya Communication Server 1000 7.5, NN43001-611, 05.09 September 2011*

[2] *System Management Reference, Avaya Communication Server 1000 7.5, NN43001-600, 05.07 August 2011*

[3] *Call Detail Recording Fundamentals, Avaya Communication Server 1000 7.5, NN43001-550, 05.03 September 2011*

Technical documentation for Phoneware Ltd can be found at *www.phoneware.ie*.

# Appendix A: Avaya Communication Server 1000E Software

```
            Avaya Communication Server 1000E call server deplists
VERSION 4121
RELEASE 7
ISSUE 50 Q +
DepList 1: core Issue: 01 (created: 2011-03-15 10:26:33 (est))
IN-SERVICE PEPS
PAT# CR #            PATCH REF #     NAME        DATE         FILENAME
SPECINS
000  wi00688505     ISS1:1OF1     p30595 1    14/06/2011   p30595 1.cpl      NO
001  wi00835294     ISS1:1OF1     p30565_1    14/06/2011   p30565_1.cpl      NO
002  wi00832106     ISS1:1OF1     p30550_1    14/06/2011   p30550_1.cpl      NO
003  wi00837618     ISS1:1OF1     p30594_1    14/06/2011   p30594_1.cpl      NO
004  wi00852365     ISS1:1OF1     p30707_1    14/06/2011   p30707_1.cpl      NO
005  wi00843623     ISS1:1OF1     p30731_1    14/06/2011   p30731_1.cpl      YES
006  wi00839255     ISS1:1OF1     p30591_1    14/06/2011   p30591_1.cpl      NO
007  wi00832626     ISS2:1OF1     p30560_2    14/06/2011   p30560_2.cpl      NO
008  wi00857566     ISS1:1OF1     p30766_1    14/06/2011   p30766_1.cpl      NO
009  wi00841980     ISS1:1OF1     p30618_1    14/06/2011   p30618_1.cpl      NO
010  wi00837461     ISS1:1OF1     p30597_1    14/06/2011   p30597_1.cpl      NO
011  wi00839821     ISS1:1OF1     p30619_1    14/06/2011   p30619_1.cpl      NO
012  wi00842409     ISS1:1OF1     p30621_1    14/06/2011   p30621_1.cpl      NO
013  wi00838073     ISS1:1OF1     p30588_1    14/06/2011   p30588_1.cpl      NO
014  wi00850521     ISS1:1OF1     p30709_1    14/06/2011   p30709_1.cpl      YES
015  wi00860722     ISS1:1OF1     p30784_1    14/06/2011   p30784_1.cpl      YES
016  wi00839134     ISS1:1OF1     p30698_1    14/06/2011   p30698_1.cpl      YES
017  wi00836981     ISS1:1OF1     p30613_1    14/06/2011   p30613_1.cpl      NO
```

```
  Avaya Communication Server 1000E Peripheral Software Version (PSWV) data
PSWV  VERSION: PSWV 100
LCRI:        VERSION NUMBER: AA02
XNET:        VERSION NUMBER: AC23
XPEC:        VERSION NUMBER: AC43
FNET:        VERSION NUMBER: AA07
FPEC:        VERSION NUMBER: AA08
MSDL:        VERSION NUMBER: AJ73
SDI:         VERSION NUMBER: AH51
DCH:         VERSION NUMBER: AA72
AML:         VERSION NUMBER: AK81
BRIL:        VERSION NUMBER: AK83
BRIT:        VERSION NUMBER: AK82
MISP:        VERSION NUMBER: AJ71
MPH:         VERSION NUMBER: AH51
BRSC:        VERSION NUMBER: AJ71
BBRI:        VERSION NUMBER: AH54
PRIE:        VERSION NUMBER: AA87
BRIE:        VERSION NUMBER: AK89
ISIG:        VERSION NUMBER: AA33
SWE1:        VERSION NUMBER: BA53
UKG1:        VERSION NUMBER: BA51
AUS1:        VERSION NUMBER: BA49
DEN1:        VERSION NUMBER: BA48
FIN1:        VERSION NUMBER: BA49
GER1:        VERSION NUMBER: BA54
ITA1:        VERSION NUMBER: AA54
NOR1:        VERSION NUMBER: BA49
POR1:        VERSION NUMBER: BA49
DUT1:        VERSION NUMBER: BA50
EIR1:        VERSION NUMBER: BA49
SWI1:        VERSION NUMBER: BA53
BEL1:        VERSION NUMBER: BA49
SPA1:        VERSION NUMBER: BA51
NET1:        VERSION NUMBER: BA48
FRA1:        VERSION NUMBER: BA52
CIS1:        VERSION NUMBER: BA48
ETSI:        VERSION NUMBER: BA48
E403:        VERSION NUMBER: BA07
N403:        VERSION NUMBER: BA05
JTTC:        VERSION NUMBER: AC08
TCNZ:        VERSION NUMBER: AA13
AUBR:        VERSION NUMBER: AA14
AUPR:        VERSION NUMBER: AA04
HKBR:        VERSION NUMBER: AA06
HKPR:        VERSION NUMBER: AA08
SING:        VERSION NUMBER: AA15
THAI:        VERSION NUMBER: AA07
NI02:        VERSION NUMBER: AA26
T1IS:        VERSION NUMBER: AA10
T1ES:        VERSION NUMBER: AA09
ESGF:        VERSION NUMBER: AC30
ISGF:        VERSION NUMBER: AC31
ESGFTI:      VERSION NUMBER: AC29
ISGFTI:      VERSION NUMBER: AC31
```

```
INDO:       VERSION NUMBER: AA06
JAPN:       VERSION NUMBER: AA16
MSIA:       VERSION NUMBER: AA04
CHNA:       VERSION NUMBER: AA04
INDI:       VERSION NUMBER: AA03
PHLP:       VERSION NUMBER: AA02
TAIW:       VERSION NUMBER: AA03
EAUS:       VERSION NUMBER: AA02
EGF4:       VERSION NUMBER: AC14
DCH3:       VERSION NUMBER: AA10
PUP3:       VERSION NUMBER: AA14
T1E1:       VERSION NUMBER: AA19
DITI:       VERSION NUMBER: AA40
CLKC:       VERSION NUMBER: AA20
3902:       VERSION NUMBER: AA84
3903:       VERSION NUMBER: AA91
3904:       VERSION NUMBER: AA94
3905:       VERSION NUMBER: AA94
MGC, MGX and MGS:  CSP  VERSION: MGCC CD01
  MSP  VERSION: MGCM AB01
  APP  VERSION: MGCA BA07
  FPGA VERSION: MGCF AA18
  BOOT VERSION: MGCB BA07
  DSP1 VERSION: DSP1 AB03
  DSP2 VERSION: DSP2 AB03
  DSP3 VERSION: DSP3 AB03
  DSP4 VERSION: DSP4 AB01
  DSP5 VERSION: DSP5 AA01
UDT VERSION NUMBER: AA42
```