Avaya Solution & Interoperability Test Lab

Application Notes for Noble Systems with Avaya Aura™ Communication Manager using a T1 Interface – Issue 1.1

Abstract

These Application Notes describe the configuration steps required for Noble Systems Noble® Solution to interoperate with Avaya Aura™ Communication Manager using T1 trunks.

The Noble® Solution is an outbound/predictive dialing and inbound call management solution that interfaces with Avaya Aura™ Communication Manager. The Noble® Solution supports various trunk interfaces to Communication Manager. This document covers only the T1 interface.

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

The Noble® Solution is an automated contact handling system that combines outbound predictive dialing and inbound ACD (automatic call distributor) switch functionality with blended call management, an integrated relational database, real-time reporting, advanced solutions, and advanced network environments.

The Noble® Solution manages telephony resources to automate and organize outbound campaigns and resources. The predictive dialing solution controls the dialing process, voice detection, call switching and screen pops. The inbound ACD capabilities perform ANI/DNIS detection and use extensive logical call control management to direct the call to the appropriate agent. Noble Systems maintains all campaigns, programs, groups, and agents, whether inbound or outbound, and records extensive data logs to track overall system performance.

The Noble® Solution supports various trunk interfaces to Communication Manager. This document covers only the T1 interface.

1.1. Interoperability Compliance Testing

The interoperability compliance testing focused on feature functionality and serviceability. The feature functionality testing evaluated the ability of the Noble® Solution to successfully establish T1 trunks to Communication Manager and to use those trunks to perform the following functions:

- Outbound Calls/Predictive Dialing: the ability to place outbound calls and then deliver the answered calls to available agents.
- Inbound Call Management: the ability to automatically distribute inbounds calls to available agents.

The serviceability testing introduced several failure conditions to see if the Noble® Solution could properly resume operation after each failure recovery.

1.2. Support

Technical support for the Noble® Solution can be obtained by contacting Noble Systems at:

- Phone: 1 (888) 966-2539
- Web: http://www.noblesys.com/contact.aspx
- Email: info@noblesys.com

2. Reference Configuration

The figure below shows the configuration used during compliance testing. The configuration is comprised of an Avaya S8500 Media Server running Communication Manager (with an Avaya G650 Media Gateway), SIP Enablement Services, the Noble® Solution server, and agents (both H.323 and SIP endpoints). Outbound calls are placed from the Noble® Solution server over a T1 trunk to the simulated PSTN. When the calls are answered, the calls are delivered over a T1 trunk to the agent endpoints on Communication Manager. Additionally, inbound T1 trunks calls are placed from the PSTN to the Noble® Solution server, and then the calls are delivered over a T1 trunk to the agent endpoints on Communication Manager.

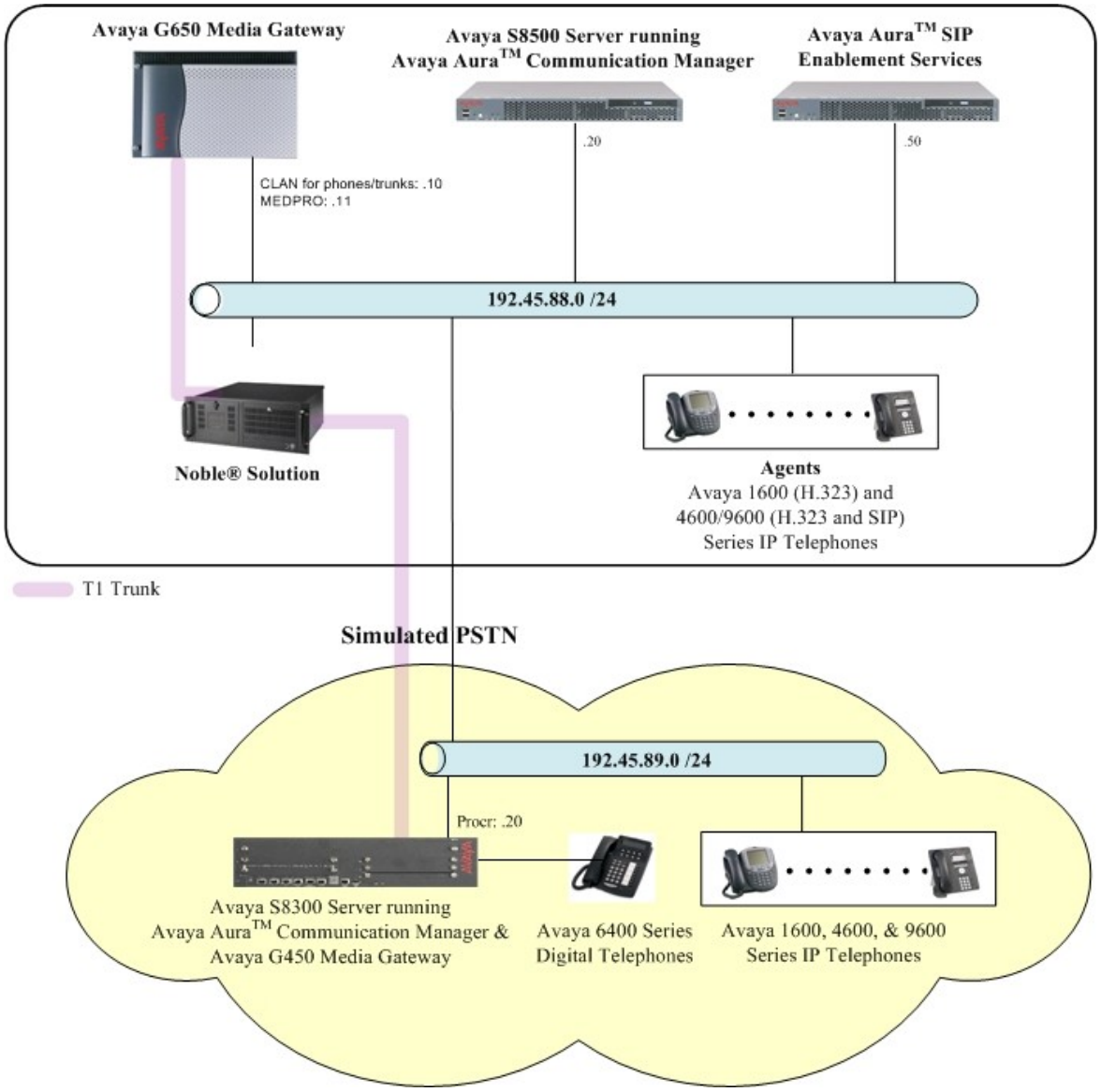


Figure 1: Noble® Solution with Communication Manager

3. Equipment and Software Validated

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

Equipment	Software
Avaya S8500 Server (w/ G650)	Avaya Aura™ Communication Manager 5.2 (R015x.02.0.947.3)
Avaya S8300 Server (w/ G450)	Avaya Aura™ Communication Manager 5.2 (R015x.02.0.947.3)
Avaya G650 Media Gateway: TN799DP (C-LAN) TN2602AP (MEDPRO) TN2312BP (IPSI) TN464F (DS1)	 HW01, FW026 HW02, FW007 HW15, FW030 000020
Avaya G450 Media Gateway : MM710BP (DS1) MM712AP (DCP)	 HW11, FW044 HW07, FW009
Avaya Aura™ SIP Enablement Services (SES) Server	5.2 (SES05.2-02.0.947.3a)
Avaya 1600 Series IP Phones : 1608SW (H.323) 1616SW (H.323)	 1.0.3 1.0.3
Avaya 4600 Series IP Phones: 4610SW (H.323) 4620SW (H.323) 4621SW (H.323)	 2.9 2.9 2.9
Avaya 9600 Series IP Phones: 9620 (H.323) 9630 (SIP)	 2.0.0 2.4.1
Avaya 6400 Series Digital Phones	-
Noble® Solution Server	4000.12

4. Configure Communication Manager

All the configuration changes in this section for Communication Manager are performed through the System Access Terminal (SAT) interface. For more information on configuring Communication Manager, refer to the Avaya product documentation, **Reference [1].**

The information shown on the screens throughout this section indicate the values that were used during compliance testing.

4.1. Configure DS1

This section provides the steps required for configuring a DS1 circuit pack.

1. Administer a DS1 circuit pack by using the "**add ds1 xxxxx"** command, where **xxxxx** is the location of the DS1 circuit pack in the media gateway. Enter the following values for the specified fields, and retain the default values for the remaining fields. Submit the form.

   - **Name:** Enter a descriptive name (e.g. **DS1**).
   - **Bit Rate: 1.544**
   - **Line Coding: b8zs**
   - **Framing Mode: esf**
   - **Signaling Mode: isdn-pri**
   - **Connect: pbx**
   - **Interface: network** The other end of the ISDN-PRI should be set to "user".
   - **Country Protocol: 1**
   - **Protocol Version: a**
   - **Interface Companding: mulaw**

```
add ds1 01a09                                                   Page   1 of   2
                                 DS1 CIRCUIT PACK

            Location: 01A09                           Name: DS1
            Bit Rate: 1.544                     Line Coding: b8zs
   Line Compensation: 1                        Framing Mode: esf
      Signaling Mode: isdn-pri
             Connect: pbx                         Interface: network
   TN-C7 Long Timers? n                    Country Protocol: 1
Interworking Message: PROGress             Protocol Version: a
Interface Companding: mulaw                             CRC? n
           Idle Code: 11111111
                              DCP/Analog Bearer Capability: 3.1kHz

                                          T303 Timer(sec): 4


      Slip Detection? n                  Near-end CSU Type: other
```

4.2. Configure Signaling Group

This section provides the steps required for configuring a signaling group.

1. Administer a signaling group by using the "**add signaling-group s"** command, where **s** is an available signaling-group number. Enter the following values for the specified fields, and retain the default values for the remaining fields. Submit the form.

   - **Group Type: isdn-pri**
   - **Primary D-Channel:** Enter **xxxxxyy**, where **xxxxx** is the board location of the DS1 circuit pack, and **yy** is the 24th channel of the DS1 circuit pack (e.g. **01A0924**).

```
add signaling-group 3                                          Page   1 of   5
                                SIGNALING GROUP

 Group Number: 3              Group Type: isdn-pri
                    Associated Signaling? y          Max number of NCA TSC: 0
                       Primary D-Channel: 01A0924     Max number of CA TSC: 0
                                                    Trunk Group for NCA TSC:
       Trunk Group for Channel Selection:
      TSC Supplementary Service Protocol: a
```

4.3. Configure Trunk Group

This section provides the steps required for configuring a trunk group.

1. Administer a T1 trunk group by using the "**add trunk-group t**" command, where **t** is an available trunk group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

   - **Group Type: isdn**
   - **Group Name:** Enter a descriptive name (e.g. **T1 trunk to Noble**).
   - **TAC:** Enter a Trunk Access Code that is valid under the provisioned dial plan (e.g. ***003**).
   - **Carrier Medium: PRI/BRI**
   - **Service Type: tie**

```
add trunk-group 3                                                Page   1 of  22
                                 TRUNK GROUP

Group Number: 3                     Group Type: isdn          CDR Reports: y
  Group Name: T1 trunk to Noble           COR: 1        TN: 1        TAC: *003
   Direction: two-way        Outgoing Display? n         Carrier Medium: PRI/BRI
 Dial Access? y              Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                    Auth Code? n            TestCall ITC: rest
                         Far End Test Line No:
TestCall BCC: 4
```

2. On **Page 6** of the form, enter the following values for the specified fields, and retain the default values for the remaining fields. Submit the form.

   - **Port:** Add one or more trunk group members by entering **xxxxxzz**, where **xxxxx** is the location of the DS1 circuit pack configured in **Section 4.1**, and **zz** is a channel in the T1 ISDN-PRI.
   - **Sig Grp:** Enter the signaling group number configured in **Section 4.2**.

```
add trunk-group 3                                                Page   6 of  22
                                 TRUNK GROUP
                                      Administered Members (min/max):   1/10
GROUP MEMBER ASSIGNMENTS                  Total Administered Members:  10

       Port    Code Sfx Name        Night           Sig Grp
  1: 01A0901  TN464  F  Port01                        3
  2: 01A0902  TN464  F  Port02                        3
  3: 01A0903  TN464  F  Port03                        3
  4: 01A0904  TN464  F  Port04                        3
  5: 01A0905  TN464  F  Port05                        3
  6: 01A0906  TN464  F  Port06                        3
  7: 01A0907  TN464  F  Port07                        3
  8: 01A0908  TN464  F  Port08                        3
  9: 01A0909  TN464  F  Port09                        3
 10: 01A0910  TN464  F  Port10                        3
```

4.4. Configure Trunk Group Channel Selection in Signaling Group

This section provides the steps required for configuring the trunk group channel selection in the signaling group.

1. Modify the signaling group by using the "**change signaling-group s**" command, where **s** is the signaling group configured in **Section 4.2**. Enter the following values for the specified fields and submit the form.

   - **Trunk Group for Channel Selection: Enter** the trunk group configured in **Section 4.3**.

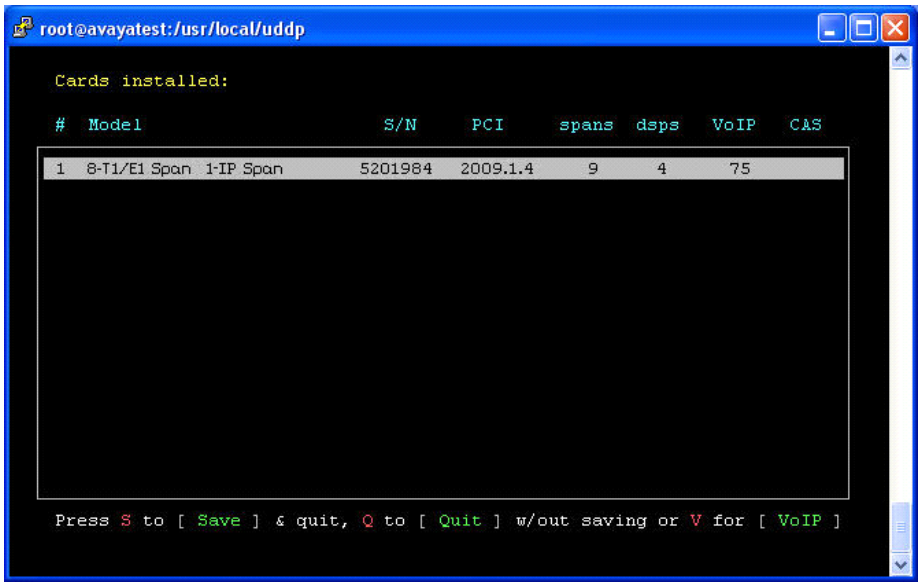
```
change signaling-group 3                                          Page   1 of   5
                                SIGNALING GROUP

 Group Number: 3              Group Type: isdn-pri
                    Associated Signaling? y          Max number of NCA TSC: 0
                       Primary D-Channel: 01A0924     Max number of CA TSC: 0
                                                   Trunk Group for NCA TSC:
       Trunk Group for Channel Selection: 3
      TSC Supplementary Service Protocol: a
```

5. Configure the Noble® Solution Server

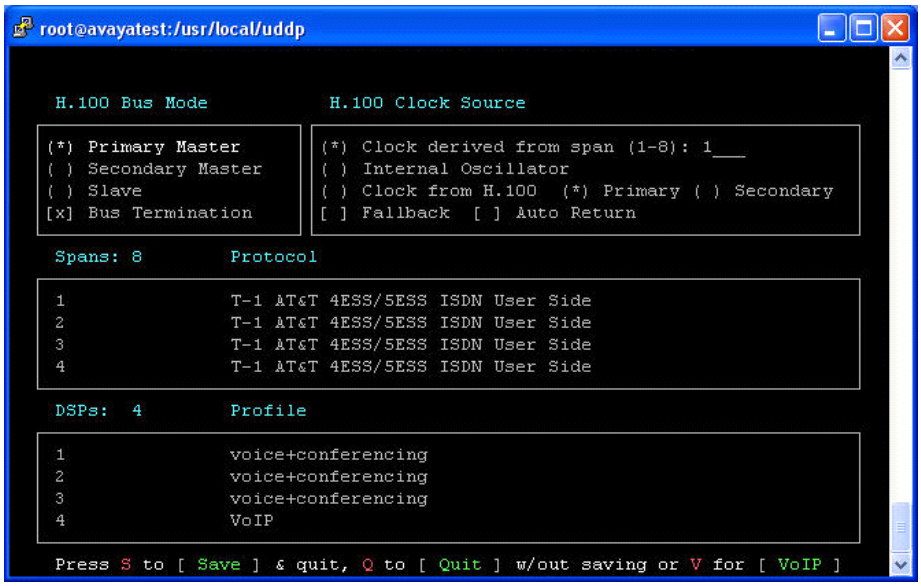
This section describes the configuration required on the Noble® Solution server to establish a T1 trunk with Avaya Aura™ Communication Manager. This configuration change can only be performed by authorized Noble personnel.

1. Log in to the Noble® Solution server with the proper credentials.

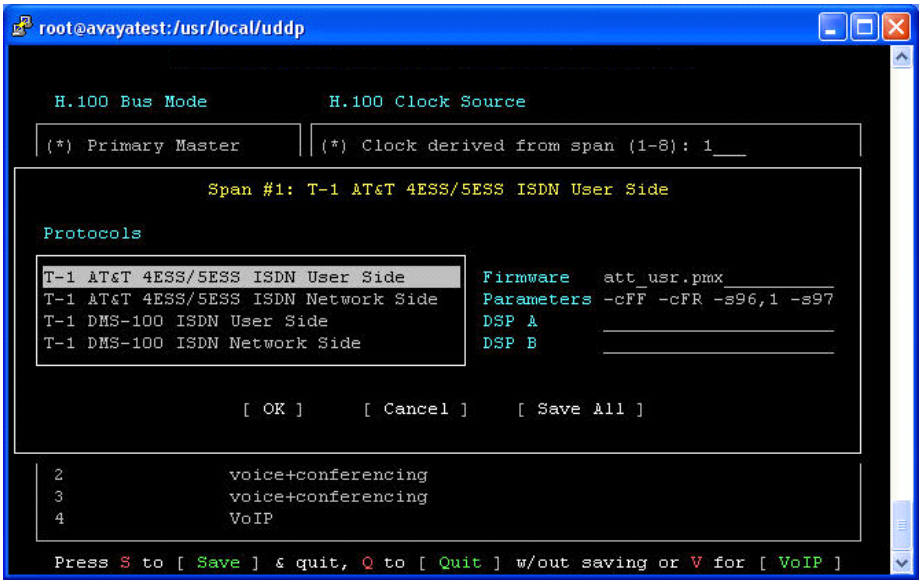
2. Select the card to be configured and press **Enter**.



3. Tab to the **Spans** section in the middle of the screen and select an entry to configure. Press **Enter**.



4. In the **Protocols** section, select **AT&T 4ESS/5ESS ISDN User Side** to match the DS1 configuration (i.e. Line Coding, Framing Mode, Signal Mode, Country Protocol, and Protocol Version) in **Section 4.1**. Select **Save All** and exit.



6. General Test Approach and Test Results

The general test approach was to place calls to and from the Noble® Solution server to verify it could properly managed outbound and inbound calls while connected to Avaya Aura™ Communication Manager via a T1 interface. Outbound calls were placed from the Noble® Solution server over a T1 trunk to a simulated PSTN. When the calls were answered, they were delivered over a T1 trunk to agent endpoints on Communication Manager. Additionally, inbound T1 trunks calls were placed from the PSTN to the Noble® Solution server, and then the calls were delivered over a T1 trunk to agent endpoints on Communication Manager.

For serviceability testing, failure conditions were introduced into the test configuration to verify that the Noble® Solution server could properly resume operation after failure recovery. These failure conditions included network cable pulls, signaling-group and trunk-group busyouts, and server resets.

All test cases were executed and passed.

7. Verification Steps

This section provides the steps that can be performed to verify proper configuration of Communication Manager and the Noble® Solution server.

1. From the SAT, enter the command **status signaling-group s**, where **s** is the number of the signaling group configured in **Section 4.2**, and verify that the **Group Stat**e is "**in-service**".

```
status signaling-group 3
                         STATUS SIGNALING GROUP

        Group ID: 3                               Active NCA-TSC Count: 0
      Group Type: isdn-pri                         Active CA-TSC Count: 0
  Signaling Type: facility associated signaling
     Group State: in-service


                           Primary D-Channel


            Port: 01A0924        Level 3 State: in-service


                          Secondary D-Channel


            Port:                Level 3 State: no-link
```

2. From the SAT, enter the command **status trunk t**, where **t** is the number of the trunk group configured in **Section 4.3**, and verify that the **Service State** for each trunk group member is either "**in-service/idle**" or "**in-service/active**".

```
status trunk 3

                              TRUNK GROUP STATUS

Member   Port     Service State      Mtce Connected Ports
                                     Busy

0003/001 01A0901  in-service/idle    no
0003/002 01A0902  in-service/idle    no
0003/003 01A0903  in-service/idle    no
0003/004 01A0904  in-service/idle    no
0003/005 01A0905  in-service/idle    no
0003/006 01A0906  in-service/idle    no
0003/007 01A0907  in-service/idle    no
0003/008 01A0908  in-service/idle    no
0003/009 01A0909  in-service/idle    no
0003/010 01A0910  in-service/idle    no
```

3. Place an outbound call from the Noble® Solution server over a T1 trunk. Verify the call is originated successfully and when the call is answered, verify the Noble® Solution server successfully delivers the call over a T1 trunk to an available agent on Communication Manager.

8. Conclusion

These Application Notes describe the steps required for configuring a T1 trunk between Avaya Aura™ Communication Manager 5.2 and the Noble® Solution server 4000.12. During compliance testing, the Noble® Solution server successfully managed inbound and outbound calls while configured with T1 interfaces. All feature and serviceability test cases were completed and passed.

9. Additional References

This section references the Avaya and Noble Systems product documentation that are relevant to these Application Notes.

The following Avaya product documentation can be found at http://support.avaya.com:

[1] *Administering Avaya Aura™ Communication Manager,* Doc ID: 03-300509, Issue 5.0, Release 5.2, May 2009
[2] *Administering Avaya Aura™ SIP Enablement Services on the Avaya S8300 Server*, Doc ID: 03-602508, Issue 2.0, May 2009

The following Noble Systems documentation was used during installation and configuration, and can be obtained by contacting Noble Systems support by phone, 888.9NOBLE9 (888.966.2539) or email, info@noblesys.com.

[3] *Noble Installation and Configuration of UDDP*
[4] *Maestro 2008.3.2 Express User Reference Manual*
[5] *Maestro 2008.3.2 Enterprise User Reference Manual*
[6] *Composer 8 v2008.4.2 Agent Manual*
[7] *Composer 8 v2008.4.2 Product Reference Manual*

10. Change History

Issue	Date	Reason
1.0	7/30/2009	Initial issue
1.1	8/14/2009	Updated Section 5, Steps 1, 3 & 4

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.