



Avaya Solution & Interoperability Test Lab

Application Notes for OnRelay Mobile Branch Exchange with Avaya Communication Manager and Avaya Application Enablement Services - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the OnRelay Mobile Branch Exchange to successfully interoperate with Avaya Communication Manager and Avaya Application Enablement Services. 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

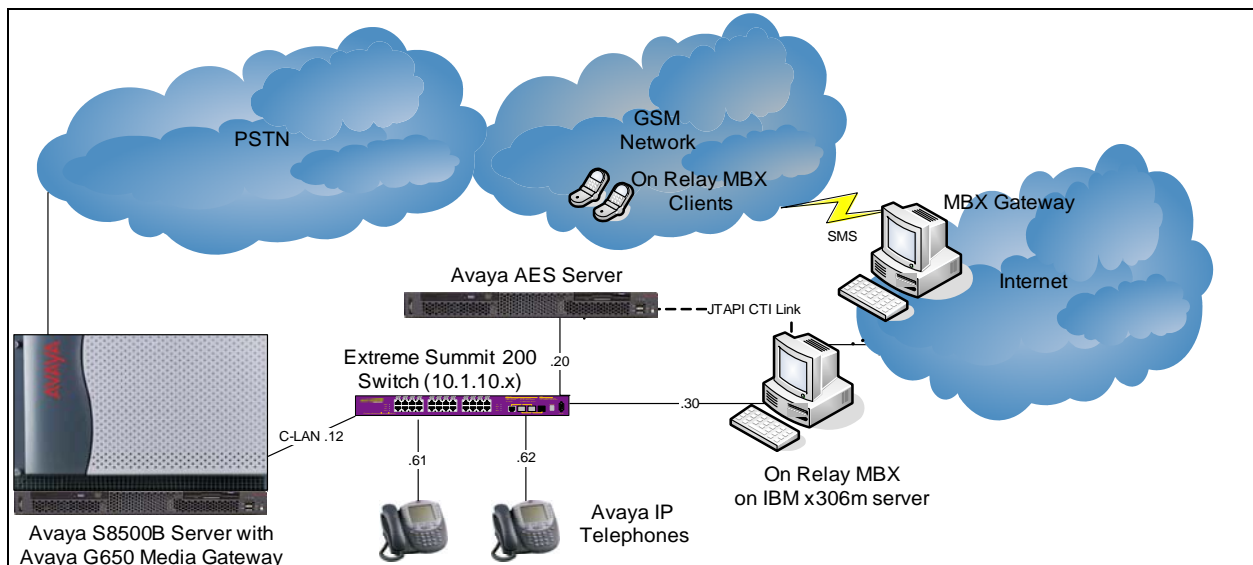
These Application Notes describe the configuration steps required for the OnRelay Mobile Branch Exchange (MBX) to successfully interoperate with Avaya Communication Manager and Avaya Application Enablement Services (AES).

The purpose of MBX is to extend the telephony services of a typical Private Branch Exchange (PBX) to that of a typical cellular phone. This is accomplished using two quite different but complementary techniques.

Firstly, the MBX, using Computer Telephony Integration (CTI) over the Java Telephony Application Programmer Interface (JTAPI), monitors a desk phone for inbound calls. On detection of an inbound call, it generates a second outbound call (also using JTAPI) to the designated cellular phone. Many other systems are able to perform in a similar fashion, and so this technique is not uncommon.

Secondly, and this is the more unique aspect of MBX, it also sends messages to the cellular phone indicating more information than is usually provided by a conventional cellular call. This could include the original caller's name or other details.

MBX offers data feeds over wireless internet (where available) or over the Short Message Service (SMS) of the Global System for Mobile communications (GSM) network. The compliance testing was only concerned with the cellular voice call and SMS data traffic. A diagram showing the configuration used in the compliance testing is shown below.



Please note that the Avaya configuration sections refer to the CTI link as the Telephony Service Application Programmer Interface (TSAPI). This is because JTAPI is mapped to TSAPI on the Avaya AES.

2. Equipment and Software Validated

The following equipment and software were used for the compliance testing.

Equipment	Software
Avaya S8500B Server	Avaya Communication Manager 4.0.1 (R014X.00.1.731.2), Service Pack 14300
Avaya G650 Media Gateway TN2312BP IPSI TN799DP C-LAN TN2302AP Medpro	N/A HW07/FW039 HW01/FW024 HW20/FW116
Avaya AES Server	AES 4.0.1 (patch 1)
Avaya 4610SW IP Telephones (H.323)	2.8
Avaya 4602SW IP Telephones (H.323)	2.3
Avaya 9620 IP Telephones (H.323)	1.5
IBM x306m Server	Windows Server 2003, Service Pack 1 OnRelay MBX 3.1.3, Patch 4.
Nokia E61 and E65 GSM Telephones	OnRelay MBX Client 3.1.3

3. Configure Avaya Communication Manager

This section provides the procedures for configuring Avaya Communication Manager. The procedures fall into the following areas.

- Verify Avaya Communication Manager licensing.
- Administer CTI link for the TSAPI service.
- Administer CTI stations.
- Administer main hunt group.

Please note that it is expected that the installer is familiar with configuring stations, agents, vectors, VDNs, etc. on Avaya Communication Manager as the focus of these Application Notes is on the configuration of the TSAPI interface only. For all other provisioning information, such as software installation, installation of optional components, basic configuration of Avaya Communication Manager, etc., refer to the Avaya Communication Manager product documentation in reference [1].

The System Administration Terminal (SAT) interface was used for all Avaya Communication Manager configuration.

3.1. Verify Avaya Communication Manager Licensing

Use the “display system-parameters customer-options” command; verify that the **ASAI Link Core Capabilities** customer option is set to “y” on **Page 3**. If this option is not set appropriately, then contact the Avaya sales team or business partner and request a new license file.

display system-parameters customer-options		Page	3 of	11
OPTIONAL FEATURES				
Abbreviated Dialing Enhanced List?	y	Audible Message Waiting?	n	
Access Security Gateway (ASG)?	n	Authorization Codes?	y	
Analog Trunk Incoming Call ID?	n	CAS Branch?	n	
A/D Grp/Sys List Dialing Start at 01?	n	CAS Main?	n	
Answer Supervision by Call Classifier?	n	Change COR by FAC?	n	
ARS?	y	Computer Telephony Adjunct Links?	n	
ARS/AAR Partitioning?	y	Cvg Of Calls Redirected Off-net?	y	
ARS/AAR Dialing without FAC?	y	DCS (Basic)?	y	
ASAI Link Core Capabilities?	y	DCS Call Coverage?	y	
ASAI Link Plus Capabilities?	n	DCS with Rerouting?	y	
Async. Transfer Mode (ATM) PNC?	n			
Async. Transfer Mode (ATM) Trunking?	n	Digital Loss Plan Modification?	n	
ATM WAN Spare Processor?	n	DS1 MSP?	y	
ATMS?	n	DS1 Echo Cancellation?	n	
Attendant Vectoring?	n			

3.2. Administer CTI Link for the TSAPI Service

This section assumes that the Internet Protocol (IP) service to the Avaya AES is previously administered. Information on how to do this is available in the Avaya AES product documentation in reference [2].

Use the “add cti-link x” command, where “x” is an available CTI link number, to add a new CTI link. Enter an available extension number in the **Extension** field. Note that the CTI link number and extension number may vary. Enter “ADJ-IP” in the **Type** field, and a descriptive name in the **Name** field. The remaining fields may be left at their default values. Submit these changes.

add cti-link 3		Page	1 of	2
CTI LINK				
CTI Link:	3			
Extension:	13300			
Type:	ADJ-IP			
				COR: 1
Name:	TSAPI CTI Link 3			

3.3. Administer CTI Stations

There are four sets of CTI stations to be administered, these are as follows:

- **Main Hunt Group:** OnRelay MBX requires these stations are configured in a consecutive range and placed in a hunt group. They are used when an MBX client makes an incoming call or accesses Avaya Communication Manager features.
- **Main Pool:** These stations are configured in a consecutive range and are used to control calls involving MBX clients.
- **Virtual:** These stations are used on calls to MBX clients, where the MBX client does not have a desk phone. There should be as many virtual stations as there are MBX clients without desk phones.
- **Indication:** There is one indication station. It is used by MBX to indicate to the client when a party is added to or dropped from a conference

For the compliance testing, the following configuration was used:

Physical stations using MBX clients: 10001 – 10003

Physical stations not using MBX clients: 10004 – 10006

Virtual stations using MBX clients: 10007 - 10009

Main hunt group: 10060

Main hunt group members: 10061 – 10063

Main pool CTI stations: 10064 – 10066

CTI indication station: 10069

All CTI stations are administered identically. Use the “add station x” command, where “x” is a valid station number. Configure the fields as follows.

- **Type:** “CTI”
- **Port:** “X”
- **Name:** Enter a descriptive name.

The remaining fields may be left at their default values.

add station 10061		Page 1 of 5
STATION		
Extension: 10061	Lock Messages? n	BCC: 0
Type: CTI	Security Code:	TN: 1
Port: X	Coverage Path 1:	COR: 1
Name: MBX CTI 1	Coverage Path 2:	COS: 1
	Hunt-to Station:	
STATION OPTIONS		
	Time of Day Lock Table:	
Loss Group: 1	Personalized Ringing Pattern: 1	
Data Module? n	Message Lamp Ext: 10061	
Display Module? n		
Survivable COR: internal	Media Complex Ext:	
Survivable Trunk Dest? y		

3.4. Administer Main Hunt Group

Use the “add hunt-group x” command, where “x” is an available hunt group number. Configure the fields on **Page 1** as follows:

- **Group Name:** Enter a descriptive name.
- **Group Extension:** Enter a valid extension number.
- **Group Type:** “ucd-mia”

The remaining fields may be left at their default values.

add hunt-group 60		Page 1 of 60
HUNT GROUP		
Group Number: 60	ACD? n	
Group Name: MBX HG	Queue? n	
Group Extension: 10060	Vector? n	
Group Type: ucd-mia	Coverage Path:	
TN: 1	Night Service Destination:	
COR: 1	MM Early Answer? n	
Security Code:	Local Agent Preference? n	
ISDN/SIP Caller Display:		

On **Page 3**, enter the range of “Main Hunt Group” CTI stations under the **Ext** column.

add hunt-group 60			Page 3 of 60	
HUNT GROUP				
Group Number: 60		Group Extension: 10060		Group Type: ucd-mia
Member Range Allowed: 1 - 1500		Administered Members (min/max): 1 /4		
Total Administered Members: 4				
GROUP MEMBER ASSIGNMENTS				
Ext	Name(19 characters)		Ext	Name(19 characters)
1: 10061	MBX CTI 1		14:	
2: 10062	MBX CTI 2		15:	
3: 10063	MBX CTI 3		16:	
4:			17:	

4. Configure Avaya AES

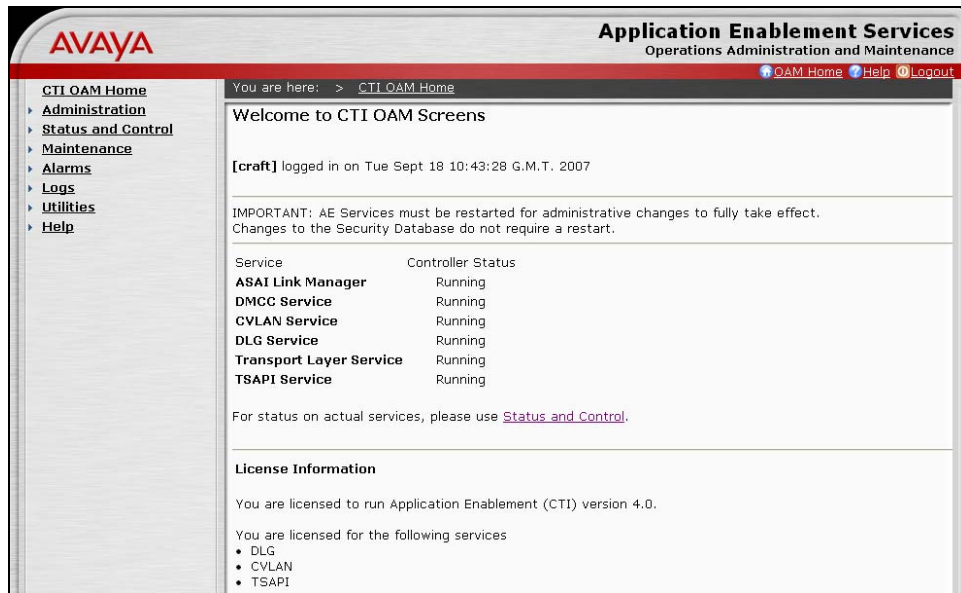
This section provides the procedures for configuring Avaya AES. The procedures fall into the following areas.

- Verify Avaya AES licensing.
- Administer TSAPI link.

Basic configuration related to the switch connection between Avaya Communication Manager and Avaya Application Enablement Services is assumed to have been established.

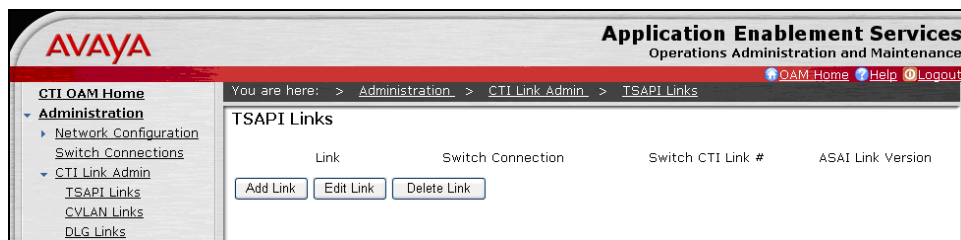
4.1. Verify Avaya AES Licensing

Initialise the AES OAM web interface by browsing to “http://x.x.x.x/8443/MVAP/index.jsp”, where “x.x.x.x” is the IP address of the AES, and log in (not shown). From the OAM Home screen select **CTI OAM Admin** (not shown) to bring up the CTI OAM Home menu. Verify the TSAPI service is licensed at the Welcome to CTI OAM Screens screen by ensuring that “TSAPI” is in the list of services in the License Information section.



4.2. Administer TSAPI link

From the CTI OAM Home menu, select **Administration > CTI Link Admin > TSAPI Links**. On the TSAPI Links screen, select **Add Link**.



On the Add/Edit TSAPI Links screen, enter the following values:

- **Link:** Use the drop-down list to select an unused link number.
- **Switch Connection:** Choose the switch connection being used from the drop-down list.
- **Switch CTI Link Number:** Corresponding CTI link number configured in **Section 3.2**.

Once completed, select **Apply Changes**.

The screenshot shows the 'Add / Edit TSAPI Links' screen. The left sidebar contains a navigation menu with 'CTI OAM Home' and 'Administration' expanded, showing 'Network Configuration', 'Switch Connections', 'CTI Link Admin', 'TSAPI Links', 'CVLAN Links', 'DLG Links', and 'DMCC Configuration'. The main content area has a breadcrumb trail: 'You are here: > Administration > CTI Link Admin > TSAPI Links'. Below this is the title 'Add / Edit TSAPI Links'. There are three dropdown menus: 'Link' with '1' selected, 'Switch Connection' with 'S8500aDC1' selected, and 'Switch CTI Link Number' with '3' selected. At the bottom are 'Apply Changes' and 'Cancel Changes' buttons.

On the Apply Changes to Link screen, select **Apply**.

The screenshot shows the 'Apply Changes to Link' screen. The left sidebar is the same as the previous screen. The main content area has a breadcrumb trail: 'You are here: > Administration > CTI Link Admin > TSAPI Links'. Below this is the title 'Apply Changes to Link'. A warning message is displayed: 'Warning! Are you sure you want to apply the changes? These changes can only take effect when the TSAPI server restarts. Please use the Maintenance -> Service Controller page to restart the TSAPI server.' At the bottom are 'Apply' and 'Cancel' buttons.

The AES must be restarted to effect the changes made in this section. From the CTI OAM Home menu, select **Maintenance > Service Controller**. On the Service Controller screen, select **Restart AE Server**.

The screenshot shows the 'Service Controller' screen. The left sidebar has 'CTI OAM Home' and 'Maintenance' expanded, showing 'Service Controller', 'Backup Database', 'Restore Database', 'Import SDB', 'Alarms', 'Logs', 'Utilities', and 'Help'. The main content area has a breadcrumb trail: 'You are here: > Maintenance > Service Controller'. Below this is the title 'Service Controller'. There is a table with two columns: 'Service' and 'Controller Status'. The table lists several services, all with a status of 'Running'. At the bottom are buttons for 'Start', 'Stop', 'Restart Service', 'Restart AE Server', and 'Restart Linux'. A note at the bottom says: 'For status on actual services, please use [Status and Control](#).'

Service	Controller Status
<input type="checkbox"/> ASAI Link Manager	Running
<input type="checkbox"/> DMCC Service	Running
<input type="checkbox"/> CVLAN Service	Running
<input type="checkbox"/> DLG Service	Running
<input type="checkbox"/> Transport Layer Service	Running
<input type="checkbox"/> TSAPI Service	Running

On the Restart AE Server screen, select **Restart**.



Wait at least 10 minutes and select **Maintenance > Service Controller**. On the Service Controller screen, verify that all services are showing “Running” in the **Controller Status** column.

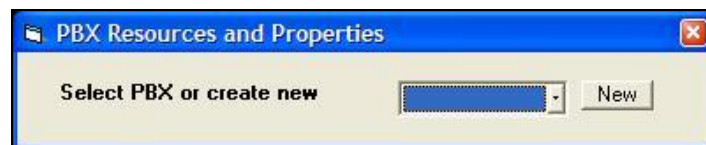
5. Configure OnRelay MBX

This section provides the procedures for configuring the OnRelay MBX PBX Configuration.

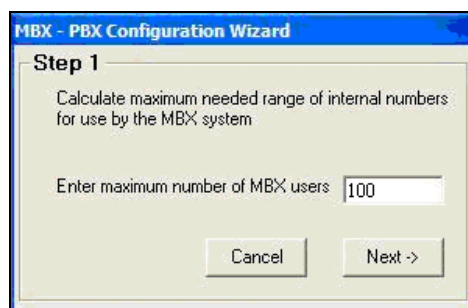
Please note that it is expected that the installer is familiar with configuring users, etc. on OnRelay MBX as the focus of these Application Notes is on the configuration of the JTAPI interface only. For all other provisioning information, such as software installation, installation of optional components, basic configuration of OnRelay MBX, etc. refer to the OnRelay MBX product documentation in reference [3].

5.1. Administer PBX Configuration

The OnRelay MBX server includes a wizard to create the PBX configuration. Select **Start > Programs > OnRelay > MBX-3.1.3 > PBX Config**. Select **New** in the PBX Resources and Properties dialog box.



Enter the maximum number of MBX users in Step 1 of the MBX –PBX Configuration Wizard and select **Next**.

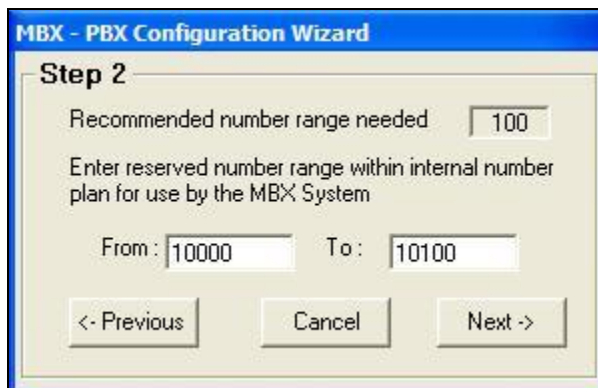


Configure the fields in Step 2 of the MBX –PBX Configuration Wizard as follows:

- **From:** Enter the first extension number of the range of Avaya Communication Manager stations to be MBX enabled.
- **To:** Enter the last extension number of the range of Avaya Communication Manager stations to be MBX enabled.

Please note that the range of stations above should include all stations used by MBX, including hunt groups and virtual stations.

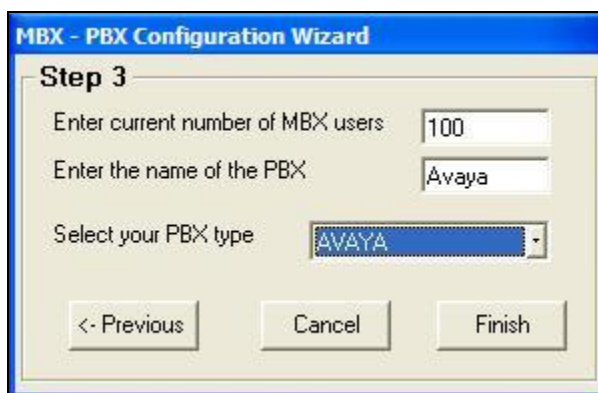
Once completed, select **Next**.



Configure the fields in Step 3 of the MBX –PBX Configuration Wizard as follows.

- **Enter current number of MBX users:** Enter the number of MBX users currently required.
- **Enter the name of the PBX:** Enter a descriptive name.
- **Select the PBX type:** “AVAYA”

Once completed, select **Finish**.



On the left hand side of the PBX Resources and Properties dialog box, select **Calculate Resources**, then configure the fields as follows.

- **Main hunt group DN:** Enter the extension number of the hunt group configured in **Section 3.4**.
- **Hunt group members:** Enter the range of “Main Hunt Group” CTI stations configured in **Section 3.3**.
- **Virtual stations main pool:** Enter the range of “Main Pool” CTI stations configured in **Section 3.3**.
- **Indication Virtual Station:** This is filled in automatically, and the value should be used when administering the indication CTI station in **Section 3.3**.
- **PBX Type:** “AVAYA”
- **Home country:** Select the country in which OnRelay MBX is installed.
- **Provider Connection String:** Enter “AVAYA#SWITCH_HOST#CSTA#AES_HOST”, where “SWITCH_HOST” is the host name of the Avaya Communication Manager server and where “AES_HOST” is the host name of the Avaya AES.
- **External access prefix:** Enter the Avaya Communication Manager feature access code for Automatic Route Selection (ARS).
- **No. of digits in internal dialplan:** Enter Avaya Communication Manager extension length.
- **No. of digits in national dialplan:** Enter the number of digits required to dial national numbers in the country where OnRelay MBX is installed.
- **Internal number to voicemail:** Enter the Avaya Communication Manager extension number used to access voicemail.
- **External number to voicemail:** Enter the full PSTN number used to access voicemail.

The remaining fields may be left at their default values. Select **Save**, then select **Exit**.

6. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing focused on the ability of OnRelay MBX to make and receive calls to and from internal and external telephones and to use the Avaya Communication Manager feature set.

The serviceability testing focused on verifying the ability of OnRelay MBX to recover from an outage condition, such as busying out the CTI link and disconnecting the Ethernet cable for the CTI link.

6.1. General Test Approach

All feature and serviceability test cases were performed manually.

For feature testing, basic telephony operations such as answer, hold/retrieve, transfer, and conference were exercised on inbound and outbound calls as well between internal calls.

For serviceability testing, calls were placed before, during and after the outages and the recordings checked for accuracy.

6.2. Test Results

All tests passed successfully.

7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager, Avaya Application Enablement Services, and OnRelay MBX.

7.1. Verify Avaya Communication Manager

Verify the status of the administered CTI link by using the “status aesvcs cti-link” command. The **Service State** should show as “established”.

status aesvcs cti-link						
AE SERVICES CTI LINK STATUS						
CTI Link	Version	Mnt Busy	AE Services Server	Service State	Msgs Sent	Msgs Rcvd
3	4	no	AESEServer	established	216	210

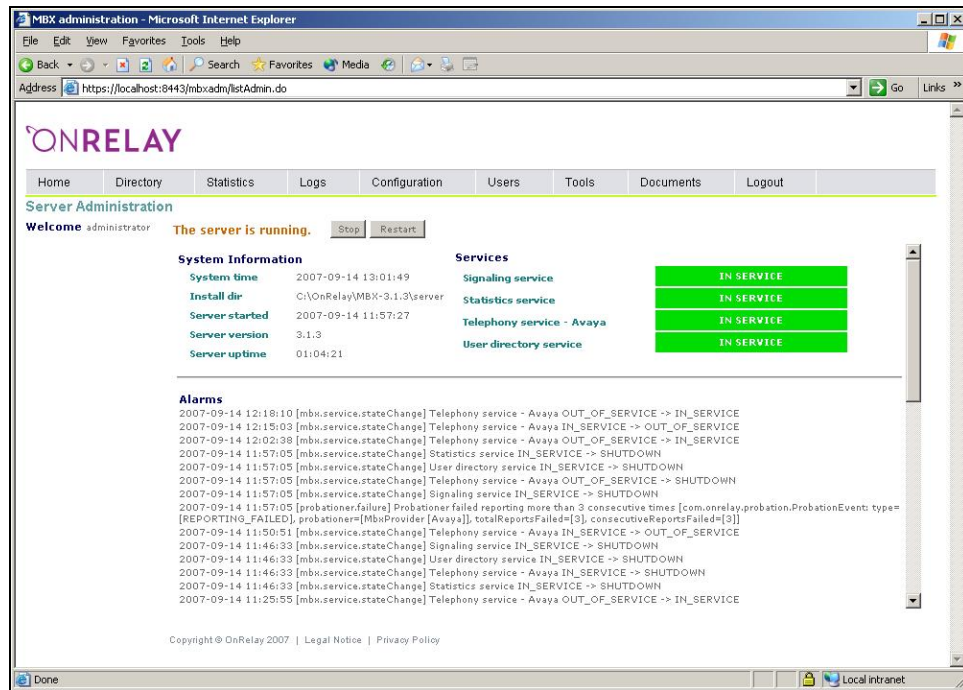
7.2. Verify Avaya Application Enablement Services

From the **AES OAM Admin** menu, verify the status of the administered CTI link by selecting **Status and Control > Switch Conn Summary**. The **Conn State** should show “Talking”.

Switch Conn	Conn State	Since	Online/Offline	Active CLANs/ Admin'd CLANs	# of TCI Conns	Msgs To Switch	Msgs From Switch	Msg Period
S8500aDC1	Talking	2007-06-18 12:53:01.0	Online	1 / 1	2	194	209	30

7.3. Verify OnRelay MBX

Initialise the OnRelay web interface by selecting **Start > Programs > OnRelay > MBX3.1.3 > Administration App** and log in (not shown). On the right hand side of the Server Administration screen, the bar to the right of **Telephony service – Avaya** should be green and show “IN SERVICE”.



8. Support

If technical support is required for OnRelay MBX, contact OnRelay Technical Support. Full details are available at <http://www.onrelay.com>.

9. Conclusion

These Application Notes describe the configuration steps required for OnRelay Mobile Branch Exchange to successfully interoperate with Avaya Communication Manager and Avaya Application Enablement Services (AES) using the Java Telephony Application Programmer Interface (JTAPI). All feature and serviceability test cases were completed and passed successfully.

10. Additional References

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

- [1] *Documentation for Avaya Communication Manager (4.0), Media Gateways and Servers*, Document ID 03-300151, Issue 6, February 2007, available at: <http://support.avaya.com>.
- [2] *Avaya Application Enablement Services 4.0 Administration and Maintenance Guide*, Document ID 02-300357, Issue 6, February 2007, available at: <http://support.avaya.com>.
- [3] OnRelay documentation is available, on request, from: <http://www.onrelay.com>

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