



Avaya Solution & Interoperability Test Lab

Application Notes for PlantCML Sentinel CM with Avaya Communication Manager and Avaya Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the PlantCML Sentinel CM 911 incident management solution to successfully interoperate with Avaya Communication Manager using Avaya Application Enablement Services. The PlantCML Sentinel CM is an integral part of the Avaya Public Safety Solution. These Application Notes also present a sample configuration for a public safety environment.

Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab at the request of the Solutions Marketing Team.

TABLE OF CONTENTS

1.	Introduction.....	4
1.1.	Public Safety Solution Overview.....	4
1.2.	PlantCML Sentinel CM Overview.....	5
2.	Network Topology	9
3.	Equipment and Software Validated	11
4.	Configure Avaya Communication Manager.....	11
4.1.	Verify Avaya Communication Manager License	12
4.2.	Administer IP Node Name for C-LAN.....	13
4.3.	Administer IP Interface for C-LAN.....	14
4.4.	Administer Data Module for C-LAN.....	15
4.5.	Administer IP Services for AES Transport Link	15
4.6.	Administer CTI Link for TSAPI Service.....	16
4.7.	Administer Physical Stations	17
4.8.	Administer System Parameters	19
4.9.	Administer Feature Access Codes	19
4.10.	Administer Hunt Group and Skill group.....	20
4.11.	Administer Agent LoginIDs	21
4.12.	Administer Vector and VDNs.....	22
5.	Configure Avaya Application Enablement Services	23
5.1.	Verify Avaya Application Enablement Services License.....	23
5.2.	Administer Local IP.....	25
5.3.	Administer Switch Connection	25
5.4.	Administer TSAPI Link.....	27
5.5.	Administer Security Database.....	28
5.6.	Obtain Tlink Name	29
5.7.	Administer Sentinel Users	30
5.8.	Administer Device Groups	32
5.9.	Restart TSAPI Service	35
5.10.	Administer Second AES Server.....	35
6.	Configure PlantCML Sentinel Server.....	36
6.1.	Administer Sentinel Server Configuration.....	36
6.2.	Launch Sentinel Server Configurator	39
6.3.	Administer Global Settings.....	39
6.4.	Restart CallP Manager	41
6.5.	Administer Sentinel Clients	42
6.6.	Verify Sentinel Accounts.....	43
6.7.	Selective Transfer Agencies Configuration	44
6.8.	Administer Trunks	44
7.	Configure PlantCML Sentinel 9-1-1 Clients	45
7.1.	Administer Physical Extension	45
7.2.	Log Into Logical Extension	48
7.3.	Administer User Configuration File	49
8.	Interoperability Compliance Testing	50
8.1.	General Test Approach	51
8.2.	Test Results	51

9.	Verification	52
9.1.	Verify Avaya Communication Manager.....	52
9.2.	Verify Avaya Application Enablement Services	53
9.3.	Verify PlantCML Sentinel Server and Sentinel 9-1-1 Client	54
10.	Troubleshooting	55
10.1.	Sentinel 9-1-1 Cannot Login.....	55
10.2.	Incorrect User Name or Password	56
10.3.	PBX Connectivity lost	57
11.	Terminology.....	58
12.	Support.....	58
13.	Conclusion	58
14.	Additional References.....	58

1. Introduction

These Application Notes describe the configuration steps required for the PlantCML Sentinel CM 911 incident management solution to successfully interoperate with Avaya Communication Manager using Avaya Application Enablement Services. The PlantCML Sentinel CM is an integral part of the Avaya Public Safety Solution. These Application Notes also present a sample configuration for a public safety environment.

1.1. Public Safety Solution Overview

The Avaya Public Safety Solution is designed to help government and private agencies responsible for the delivery of public safety services to enterprises and civilian populations. This includes:

- ↳ **Avaya Contact Center** applications such as expert agent selection to ensure the most qualified and most available resource rapidly attends to the case.
- ↳ **PlantCML Sentinel CM and Intelligent Work Station** integration which provides the public safety community with call-center solutions designed to streamline emergency call-taking. Sentinel CM is a 911 incident management solution, and integration with Avaya Communication Manager is achieved through the Avaya Application Enablement Services (AES) Telephony Services Application Programming Interface (TSAPI) & Device, Media and Call Control Interface (DMCC) services.
- ↳ **Raytheon JPS ACU-2000IP Intelligent Interconnect System** integration which provides seamless communication across traditionally disparate communications such as Land-based Mobile Radio (LMR). The ACU-2000IP is a radio IP/SIP gateway that allows IP-PBX stations to interface with radios. Multiple interface cards allow all radios to be a part of the IP-PBX system. Integration with Avaya Communication Manager is achieved through the SIP Enablement Services (SES).
- ↳ **NICE CLS/VoIP Logger** integration for secure recording of audio on the entire chain of service delivery from the conversations with the citizen, to command and control and dispatch, to resolution.

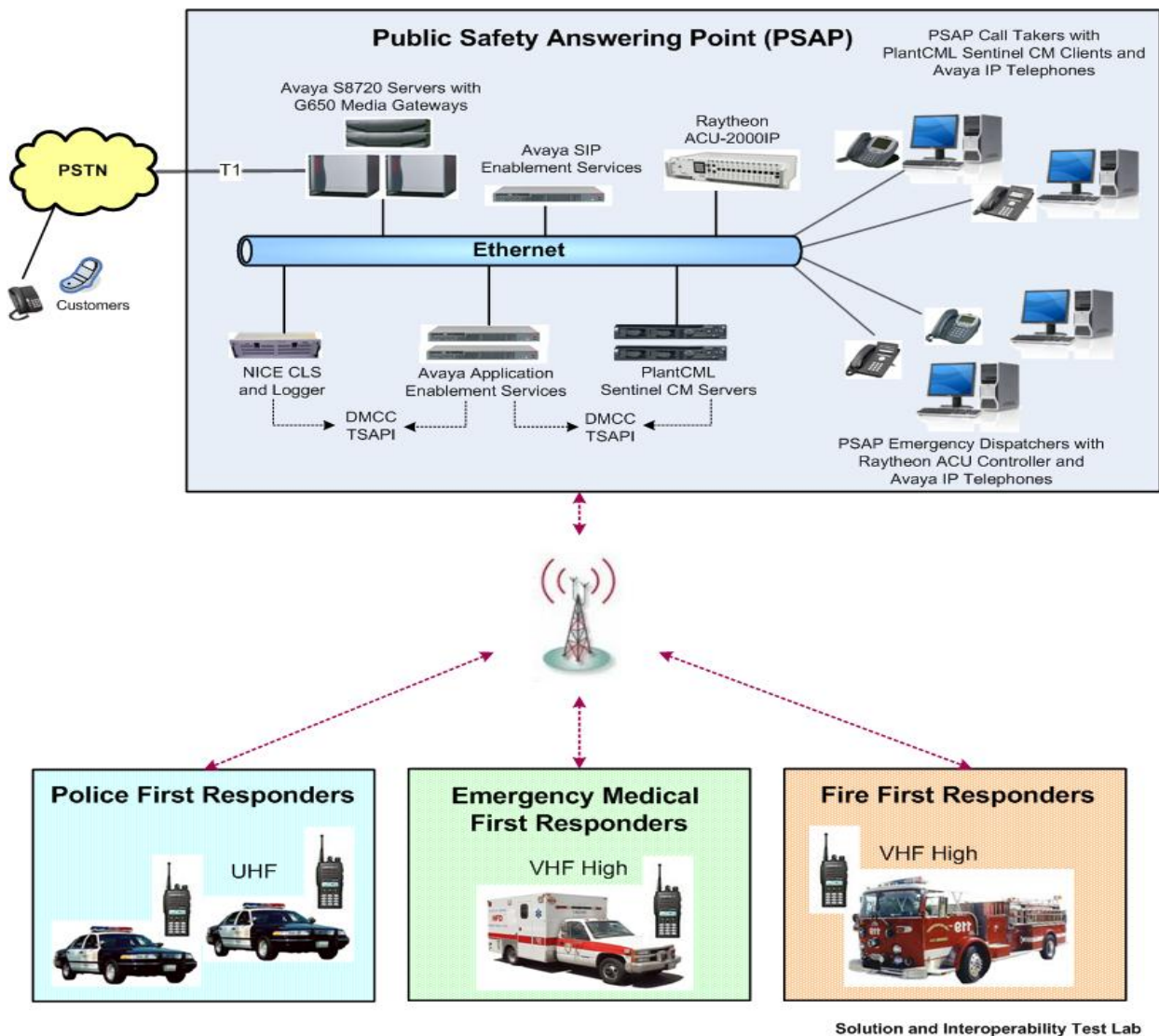


Figure 1: Avaya Public Safety Solution Reference Configuration

1.2. PlantCML Sentinel CM Overview

PlantCML Sentinel CM is an IP based incident response system that:

- receives 9-1-1 emergency and administrative calls
- automatically looks up the caller's location based on the caller's telephone number and other information
- presents the call to a call taker at a Sentinel 9-1-1 workstation
- enables call takers to transfer call or data to outside agencies (e.g., fire, police, ambulance, Sheriff's office)

National Emergency Number Association (NENA) recommends critical reliability of the IP-PBX, duplicate AES servers and redundant PlantCML Sentinel CM servers. The PlantCML

Sentinel CM servers function as an active/standby, with the standby ready to take over from the active server upon failure. The redundant PlantCML Sentinel CM servers use the CTI link to communicate with each AES server. Telephony Services Application Programming Interface (TSAPI) is used within Sentinel CM Server to automatically retrieve relevant provisioning information from Avaya Communication Manager and to monitor the call queue, etc.

PlantCML Sentinel CM solution consists of:

- A pair of Sentinel CM Servers
- Sentinel 9-1-1 Intelligent Workstations.

The 911 call answering agents have Sentinel 9-1-1 Intelligent Workstations (IWS) as their desktops and are equipped with an Avaya IP Telephone. Sentinel 9-1-1 IWS are Windows XP machines with the Sentinel 9-1-1 client application. This application provides visual incoming call alerts, and Automatic Location Information (ALI) call information to the 911 call answering agents. Each Sentinel 9-1-1 client has both a TSAPI connection and a Device, Media and Call Control (DMCC) API connection to Avaya AES. The TSAPI call control services are utilized by the Sentinel 9-1-1 clients to support call related actions initiated from the agent desktops, such as log in, answer, and transfer calls. The Device Media and Call Control API services are utilized by the Sentinel 9-1-1 clients to support single button activation of features, such as call park and call pickup from the agent desktops.

When an incoming 911 call is routed by Avaya Communication Manager and delivered to an available agent, the Sentinel active server utilizes the Automatic Numbering Identification (ANI) in the TSAPI event reports to look up the associated Automatic Location Identification (ALI) information, and populates the answering agent screen with both ANI and ALI. The ALI information is typically provided by an external ALI provider. The Sentinel active server will interface with this ALI provider. For the compliance testing, the Sentinel server utilized an internal database to obtain the ALI information.

1.2.1. Sentinel 9-1-1 Intelligent Workstations (IWS)

The Sentinel 9-1-1 Intelligent Workstation enables the 911 call answering personnel to easily manage and handle 9-1-1 calls. The Sentinel 9-1-1 Application provides one-button transfers for voice and data, audio and visual incoming call alerts, dynamic call status indicators, intelligent call prompting and much more. TTY and instant recall recorder functionalities are integrated in the Sentinel 9-1-1 application.

1.2.2. Sentinel GUI

The Sentinel GUI provides a Windows interface to all features of the 9-1-1 CTI application. The navigation of the application is through a PC keyboard and the mouse pointing device. The GUI is designed around a Microsoft Windows standard user interface.

1.2.3. Patriot Communications Server (PCS) API

The communication with Sentinel Server is realized via the PCS API software layer. Sentinel communicates with Sentinel Server through the CallP Manager module. The transport protocol is TCP over IP.

1.2.4. TSAPI

Telephony Server Application Interface (TSAPI) is an Avaya API to communicate with an Avaya Telephony Server AES.

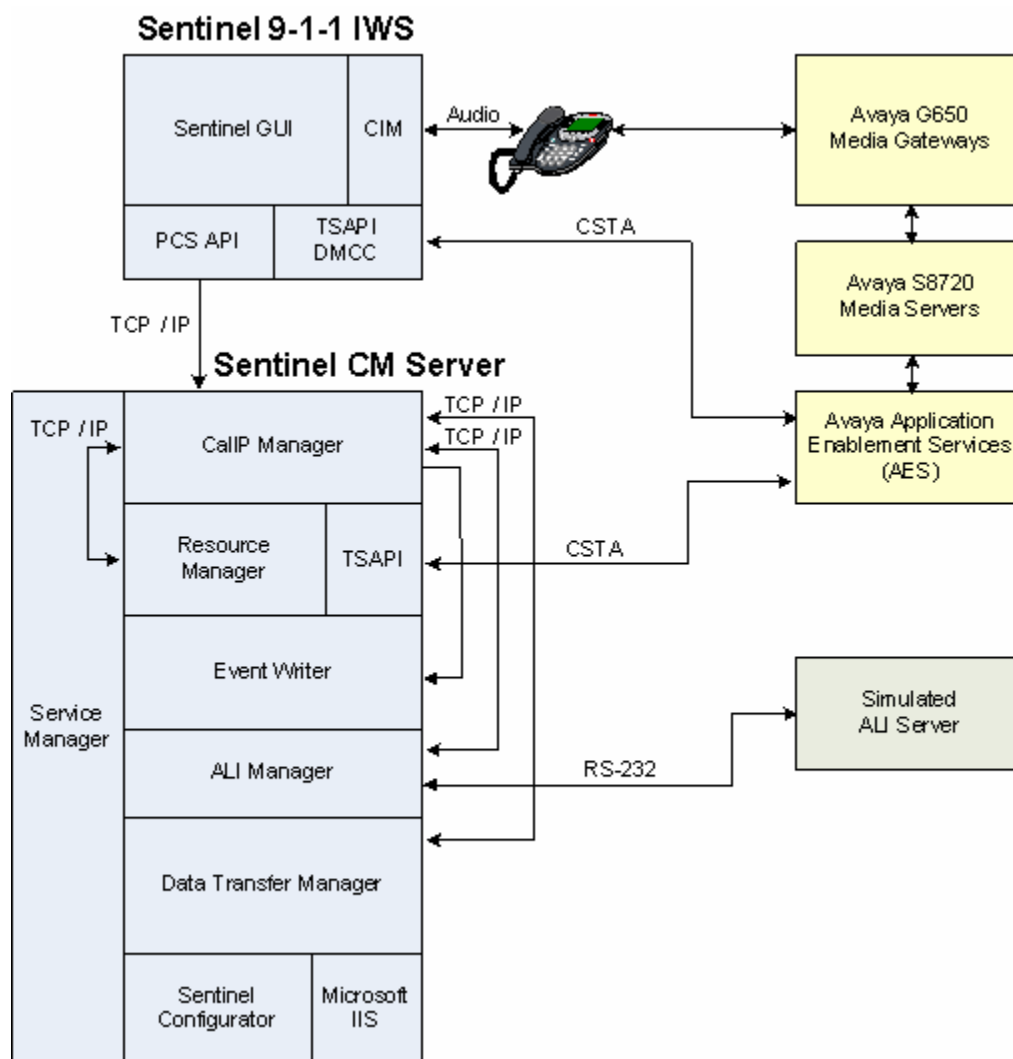
1.2.5. DMCC

DMCC is a Telephony Server API that supports Computer-Supported Telecommunications Applications (CSTA) standard CTI interface. This interface is used to implement features that are not supported by TSAPI (Call Park, Call Pickup).

1.2.6. Computer Interface Module (CIM)

The audio card facilitates voice communication from the telephone set to operator's headset.

1.2.7. Sentinel CM Server Components



Sentinel Server Service Manager

The Sentinel Server Service Manager starts up all Sentinel Server Services and makes sure they remain operational.

CallP Manager

- Manages the data transactions associated with all the calls of the system.
- Sends system activities to the Event Writer.
- Receives all local PBX activities from the Sentinel and system wide activities from the Resource Manager.
- Provides call detail information (ALI, ESN, STI, etc.) to the Sentinel via TCP/IP.
- Connects to backup CallP Manager to maintain hot standby duplication.

Resource Manager

- Monitors the activity events in Avaya Application Enablement Server (AES) and forwards the info to the CallP Manager.
- Provides COM interface for the Sentinel Server Configurator.

Event Writer

- Receives the system activity events from the CallP Manager.
- Writes all activity events into the relational database.

ALI Manager

- Provides ALI for 9-1-1 and admin calls (manual request).
- ALI is interfaced with an external ALI provider via an RS-232 serial port. For testing purposes, a simulated ALI database will be used.

Data Transfer Manager

This module is responsible for transferring the information given by the CallP Manager to the RS-232 data ports.

Following are supported by PlantCML Sentinel CM Data Transfer Manager, however these were not tested as part of the Solution Validation.

- Communication with CAD systems
- Fax/Modem dial-out
- Dedicated data port
- Interface to DLR logging systems to provide Call Details

2. Network Topology

The network implemented for the reference configuration is shown in **Figure 2**. The Public Safety Answering Point location consists of Avaya S8720 Servers controlling G650 Media Gateways. The PSAP location is also equipped with a pair of Avaya Application Enablement Services (AES) servers, Avaya IP phones, a pair of PlantCML Sentinel CM servers and multiple Sentinel 9-1-1 clients.

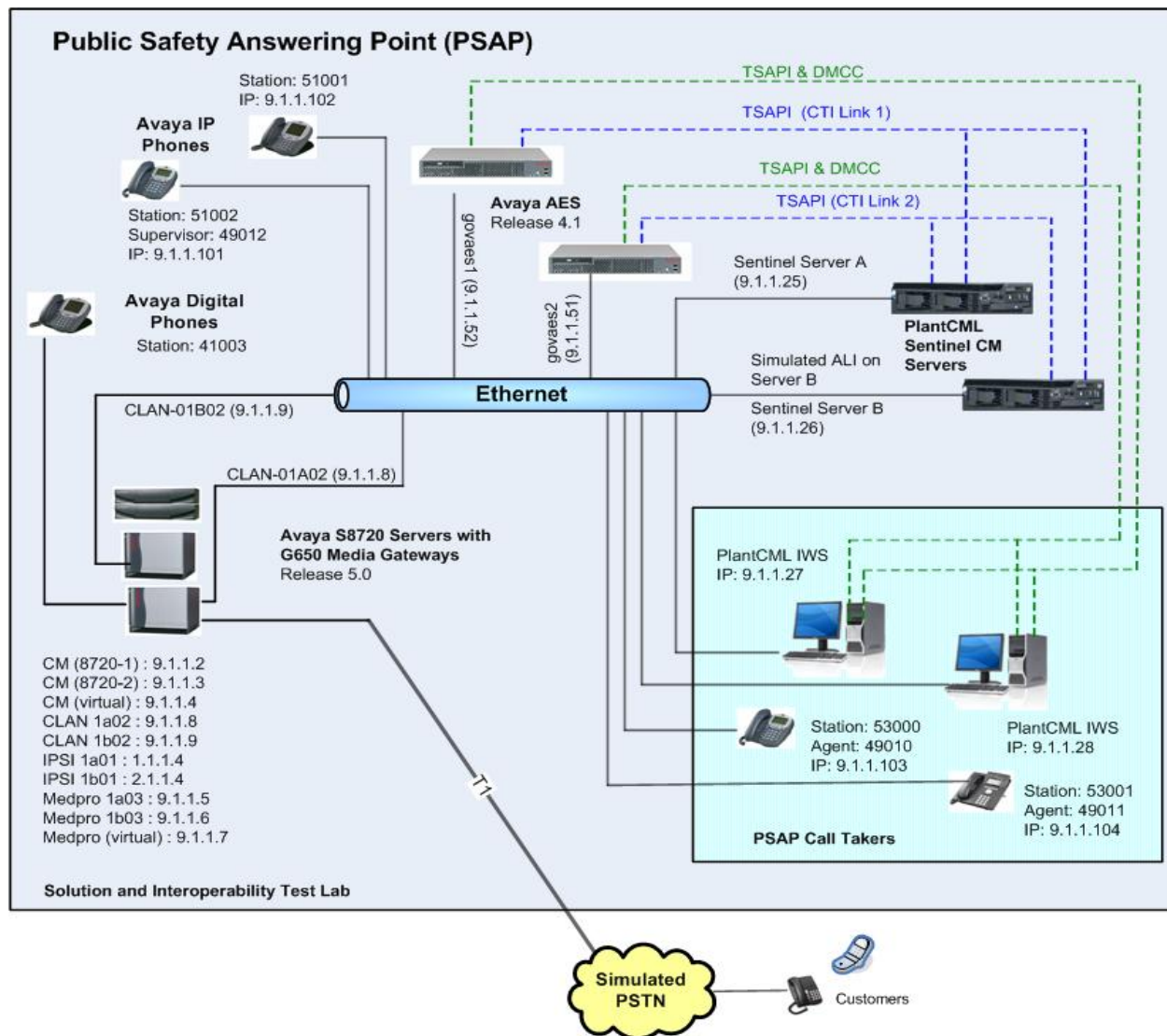


Figure 2: PlantCML Sentinel CM with Avaya Communication Manager and Avaya AES

Note: The sample configuration does not have duplicated LAN network. In customer deployments, duplicated LAN can be used. The PlantCML Sentinel CM servers can be on different LANs. The two servers need to have routable addresses.

3.

Equipment and Software Validated

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

Device Description	Versions Tested
Avaya Communication Manager - S8720 Servers	Release 5.0 (R015x.00.0.825.4)
Avaya G650 Media Gateway - IPSI (TN2312BP) - CLAN (TN799DP) - MedPro (TN2602AP)	- HW15 FW039 - HW01 FW156 - HW02 FW033
Avaya AES	Release 4.1 (Build 31.2)
Avaya 4600 Series H.323 Telephones	R2.8
Avaya 9600 Series H.323 Telephones	R1.5
Avaya 6211 Analog Telephones	N/A
Avaya 2420 Digital Telephones	N/A
PlantCML Sentinel - Sentinel CM Server - Sentinel Intelligent Workstation	Release 1.2 Build 10 Release 1.2 Build 10 OS for the IWS is Windows XP Professional (Service Pack 2)

4. Configure Avaya Communication Manager

This section provides the procedures for configuring Avaya Communication Manager. The procedures include the following areas:

- Verify Avaya Communication Manager License
- Administer IP node name for C-LAN
- Administer IP interface for C-LAN
- Administer data module for C-LAN
- Administer IP services for AES transport link
- Administer CTI link for TSAPI service
- Administer physical stations
- Administer system parameters
- Administer feature access codes
- Administer Hunt Group and Skill group
- Administer Agent LoginIDs
- Administer Vector and VDNs

As shown in **Figure 2**, two C-LAN modules, two AES servers, and two CTI links need to be administered.

4.1. Verify Avaya Communication Manager License

Log into the System Access Terminal (SAT) to verify that the Avaya Communication Manager license has proper permissions for features illustrated in these Application Notes. Use the “display system-parameters customer-options” command to verify that the **Computer Telephony Adjunct Links** customer option is set to “y” on **Page 3**. If this option is not set to “y”, then contact the Avaya sales team or business partner for a proper license file.

display system-parameters customer-options		Page 3 of 11
OPTIONAL FEATURES		
Abbreviated Dialing Enhanced List? n	Audible Message Waiting? y	
Access Security Gateway (ASG)? n	Authorization Codes? y	
Analog Trunk Incoming Call ID? y	Backup Cluster Automatic Takeover? n	
A/D Grp/Sys List Dialing Start at 01? y	CAS Branch? n	
Answer Supervision by Call Classifier? y	CAS Main? n	
ARS? y	Change COR by FAC? n	
ARS/AAR Partitioning? y	Computer Telephony Adjunct Links? y	
ARS/AAR Dialing without FAC? y	Cvg Of Calls Redirected Off-net? y	
ASAI Link Core Capabilities? y	DCS (Basic)? y	
ASAI Link Plus Capabilities? y	DCS Call Coverage? Y	

Navigate to **Page 6**, and verify that the **Expert Agent Selection (EAS)** and **Vectoring (Basic)** customer options are set to “y”.

display system-parameters customer-options		Page 6 of 11
CALL CENTER OPTIONAL FEATURES		
Call Center Release: 5.0		
ACD? y	Reason Codes? y	
BCMS (Basic)? y	Service Level Maximizer? n	
BCMS/VuStats Service Level? y	Service Observing (Basic)? y	
BSR Local Treatment for IP & ISDN? y	Service Observing (Remote/By FAC)? y	
Business Advocate? y	Service Observing (VDNs)? y	
Call Work Codes? y	Timed ACW? y	
DTMF Feedback Signals For VRU? y	Vectoring (Basic)? y	
Dynamic Advocate? y	Vectoring (Prompting)? y	
Expert Agent Selection (EAS)? y	Vectoring (G3V4 Enhanced)? Y	

Navigate to **Page 10**, and verify that there are sufficient **IP_API_A** licenses. One such license will be required for each 911 call answering agent.

display system-parameters customer-options		Page 10 of 11
MAXIMUM IP REGISTRATIONS BY PRODUCT ID		
Product ID	Rel. Limit	Used
IP_API_A	: 100	4
IP_API_B	: 100	0
IP_API_C	: 100	0
IP_Agent	: 300	0
IP_IR_A	: 0	0
IP_Phone	: 12000	5
IP_ROMax	: 12000	0
IP_Soft	: 300	0
IP_eCons	: 0	0

4.2. Administer IP Node Name for C-LAN

Enter the “change node-names ip” command, and add an entry for the C-LAN that will be used for connectivity to the AES server. For the PlantCML Sentinel CM application, two AES servers will be used. These two AES servers will use two C-LAN modules.

For the sample configuration, use the following in the **Name** and **IP Address**. The actual node name and IP address may vary. Submit these changes.

C-LAN	
Name	IP Address
CLAN-01A02	9.1.1.8
CLAN-01B02	9.1.1.9

AES Server	
Name	IP Address
govaes1	9.1.1.52
govaes2	9.1.1.51

change node-names ip		Page 1 of 2
IP NODE NAMES		
Name	IP Address	
AES1	9.1.1.50	
CLAN-01A02	9.1.1.8	
CLAN-01B02	9.1.1.9	
CLAN-RETAIL	30.1.1.4	
FCSWinsuite	9.1.1.203	
GVT-S8300-LSP	9.1.4.2	
MedPro-01A03	9.1.1.5	
MedPro-01B07	9.1.1.6	
RedSky1	9.1.1.55	
RedSky2	9.1.1.56	
S8500-ESS	9.1.1.13	
SES1	9.1.1.34	
VAL-01A12	9.1.1.12	
clan-trade	5.1.1.4	
default	0.0.0.0	
govmas1	9.1.1.31	
(16 of 17 administered node-names were displayed)		
Use 'list node-names' command to see all the administered node-names		
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name		

4.3. Administer IP Interface for C-LAN

Add the C-LAN to the system configuration using the “add ip-interface <board location>” command. In the sample configuration, “1a02” for CLAN-01A02 and “1b02” for CLAN-01B02” will be used. Note that the actual slot number may vary. Enter the C-LAN node name assigned from **Section 4.2** into the **Node Name** field. The **IP Address** field will be populated automatically.

Enter proper values for the **Subnet Mask** and **Gateway Address** fields. Set the **Enable Ethernet Port** field to “y”, and select the appropriate **Network Region** for the C-LAN dedicated for AES connectivity. Default values may be used in the remaining fields. For the sample configuration, Network Region 1 is used. Submit these changes.

Note two C-LAN modules need to be administered, one for each AES server.

add ip-interface 1a02		Page 1 of 1
IP INTERFACES		
Type: C-LAN		
Slot: 01A02		
Code/Suffix: TN799 D		
Node Name: CLAN-01A02		
IP Address: 9 .1 .1 .8		Link: 1
Subnet Mask: 255.255.255.0		
Gateway Address: 9 .1 .1 .1		
Enable Ethernet Port? y	Allow H.323 Endpoints? y	
Network Region: 1	Allow H.248 Gateways? n	
VLAN: n	Gatekeeper Priority: 1	
Target socket load and Warning level: 400		
Receive Buffer TCP Window Size: 8320		
ETHERNET OPTIONS		
Auto? y		

add ip-interface 1b02		Page 1 of 1
IP INTERFACES		
Type: C-LAN		
Slot: 01B02		
Code/Suffix: TN799 D		
Node Name: CLAN-01B02		
IP Address: 9 .1 .1 .9		Link: 2
Subnet Mask: 255.255.255.0		
Gateway Address: 9 .1 .1 .1		
Enable Ethernet Port? y	Allow H.323 Endpoints? y	
Network Region: 1	Allow H.248 Gateways? n	
VLAN: n	Gatekeeper Priority: 1	
Target socket load and Warning level: 400		
Receive Buffer TCP Window Size: 8320		
ETHERNET OPTIONS		
Auto? y		

4.4. Administer Data Module for C-LAN

Add a new data module using the “add data-module n” command, where “n” is an available extension for each C-LAN module. Enter the following values:

- **Name:** A descriptive name
- **Type:** “ethernet”
- **Port:** Same slot number from **Section 4.3**, suffixed with port “17”
- **Link:** An available link number

```
add data-module 40000
                                DATA MODULE

Data Extension: 40000          Name: CLAN-01A02
Type: ethernet
Port: 01A0217
Link: 1

Network uses 1's for Broadcast Addresses? Y
```

```
add data-module 49999
                                DATA MODULE

Data Extension: 49999          Name: CLAN-01B02
Type: ethernet
Port: 01b0217
Link: 2

Network uses 1's for Broadcast Addresses? Y
```

4.5. Administer IP Services for AES Transport Link

Administer the transport link to the AES server with the “change ip-services” command. Add an entry with the following values for fields on **Page 1**:

- **Service Type:** “AESVCS”
- **Enabled:** “y”
- **Local Node:** C-LAN node name from **Section 4.2**
- **Local Port:** Retain the default value of “8765”

```
change ip-services
Page 1 of 4

Service      Enabled   Local      IP SERVICES
Type         Node      Local      Remote
AESVCS       y         CLAN-01A02 Port      Node
AESVCS       y         CLAN-01B02 8765     Port
```

Proceed to **Page 4**, and enter the following values:

- **AE Services Server:** Name obtained from the AES server.
- **Password:** Same password to be administered on the AES server.
- **Enabled:** “y”

Note that the name and password entered for the **AE Services Server** and **Password** fields are case sensitive, and must match the name and password on the AES server. The administered name for the AES server is created as part of the AES installation, and can be obtained from the AES server by typing “uname -n” at the Linux command prompt. The same password entered in the screen below will need to be set on the AES server, as described in **Section 5.3**.

Note two AES servers need to be administered on the ip-services form.

change ip-services				Page	4 of	4
AE Services Administration						
Server ID	AE Services	Password	Enabled	Status		
	Server					
1:	govaes1	*	y			
2:	govaes2	*	y			
3:						

4.6. Administer CTI Link for TSAPI Service

Add a CTI link using the “add cti-link n” command, where “n” is an available CTI link number. 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. Default values may be used in the remaining fields. Submit these changes.

Note two CTI-Links need to be administered, one for each AES server.

add cti-link 1		Page 1 of 3	
CTI LINK			
CTI Link: 1			
Extension: 55000			
Type: ADJ-IP			
		COR: 1	
Name: TSAPI GOVAES1			

add cti-link 2		Page 1 of 3	
CTI LINK			
CTI Link: 2			
Extension: 55001			
Type: ADJ-IP			
		COR: 1	
Name: TSAPI GOVAES2			

4.7. Administer Physical Stations

Add a physical station for each 911 call answering agent using the “add station n” command, where “n” is an available extension number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Type:** A valid station type. In this case, “4620” and “9630” were used.
- **Name:** A descriptive name.
- **Security Code:** Enter a valid code.
- **IP SoftPhone:** “y”

Note that enablement of **IP SoftPhone** allows the physical station to be controlled by a softphone application such as Sentinel 9-1-1.

add station 53000		Page 1 of 5	
STATION			
Extension: 53000	Lock Messages? n	BCC: 0	
Type: 4620	Security Code: 53000	TN: 1	
Port: IP	Coverage Path 1:	COR: 1	
Name: PlantCML 46XX	Coverage Path 2:	COS: 1	
	Hunt-to Station:		
STATION OPTIONS			
Loss Group: 19	Personalized Ringing Pattern: 1		
Data Option: none	Message Lamp Ext: 53000		
Speakerphone: 2-way	Mute Button Enabled? y		
Display Language: english	Expansion Module? n		
	Media Complex Ext:		
	IP SoftPhone? y		

Proceed to **Page 2**, and set the **Multimedia Mode** to “enhanced”. This configuration is needed to enable Sentinel 9-1-1 clients to obtain the phone display information.

add station 53000		Page 2 of 5	
STATION			
FEATURE OPTIONS			
LWC Reception: spe	Auto Select Any Idle Appearance? n		
LWC Activation? y	Coverage Msg Retrieval? y		
LWC Log External Calls? n	Auto Answer: none		
CDR Privacy? n	Data Restriction? n		
Redirect Notification? y	Idle Appearance Preference? n		
Per Button Ring Control? n	Bridged Idle Line Preference? n		
Bridged Call Alerting? n	Restrict Last Appearance? y		
Active Station Ringing: single	Conf/Trans on Primary Appearance? n		
H.320 Conversion? n	Per Station CPN - Send Calling Number?		
Service Link Mode: as-needed	Audible Message Waiting? n		
Multimedia Mode: enhanced	Display Client Redirection? n		
MWI Served User Type:	Select Last Used Appearance? n		
AUDIX Name:			

On either **Page 4** or **Page 5**, assign the following features to any available buttons: “call-park”, “call-pkup”, and “flash”. Note that each station has to have these three feature buttons. The Sentinel 9-1-1 clients will pick up the correct location of the feature buttons from Avaya AES using the Device, Media and Call Control API.

```

add station 53000

```

		Page 4 of 5
STATION		
SITE DATA		
Room:		Headset? n
Jack:		Speaker? n
Cable:		Mounting: d
Floor:		Cord Length: 0
Building:		Set Color:
ABBREVIATED DIALING		
List1:	List2:	List3:
BUTTON ASSIGNMENTS		
1: call-appr	5: call-park	
2: call-appr	6: call-pkup	
3: call-appr	7: flash	
4:	8:	

Repeat the “add station n” command to add the desired number of stations. For the compliance testing, two stations were administered as shown below.

```

list station 53000 count 2

```

STATIONS									
Ext/ Type	Port/ Hunt-to	Name/ Surv GK NN	Move	Room/ Data Ext	Cv1/ Cv2	COR/ COS	Cable/ Jack		
53000	S00192 4620	PlantCML 46XX	no			1			
53001	S00195 9630	PlantCML 96xx	no			1			

4.8. Administer System Parameters

Enter the “change system-parameters features” command. Navigate to **Page 4**, and set the **Temporary Bridged Appearance on Call Pickup** to “n”.

```
change system-parameters features                               Page 4 of 17
      FEATURE-RELATED SYSTEM PARAMETERS
      Reserved Slots for Attendant Priority Queue: 5
      Time before Off-hook Alert: 10
      Emergency Access Redirection Extension:
      Number of Emergency Calls Allowed in Attendant Queue: 5

      Call Pickup on Intercom Calls? y      Call Pickup Alerting? n
Temporary Bridged Appearance on Call Pickup? n      Directed Call Pickup? n
      Extended Group Call Pickup: none
```

Proceed to **Page 6**, and set **Auto Hold** to “y”.

```
change system-parameters features                               Page 6 of 17
      FEATURE-RELATED SYSTEM PARAMETERS
      Public Network Trunks on Conference Call: 5      Auto Start? n
      Conference Parties with Public Network Trunks: 6      Auto Hold? y
      Conference Parties without Public Network Trunks: 6      Attendant Tone? y
      Night Service Disconnect Timer (seconds): 180      Bridging Tone? y
      Short Interdigit Timer (seconds): 3      Conference Tone? n
      Unanswered DID Call Timer (seconds): 60      Intrusion Tone? n
      Line Intercept Tone Timer (seconds): 30      Mode Code Interface? y
      Long Hold Recall Timer (seconds): 0
      Reset Shift Timer (seconds): 0
      Station Call Transfer Recall Timer (seconds): 0
      DID Busy Treatment: tone
```

4.9. Administer Feature Access Codes

Enter the “change feature-access-codes” command. Set the **Call Park Access Code** and **Answer Back Access Code**. These will be needed in **Section 6.3** for Park and Unpark. For the sample configuration, *41 and *42 were used.

```
change feature-access-codes                                     Page 1 of 9
      FEATURE ACCESS CODE (FAC)
      Abbreviated Dialing List1 Access Code: *70
      Abbreviated Dialing List2 Access Code:
      Abbreviated Dialing List3 Access Code:
      Abbreviated Dial - Prgm Group List Access Code:
      Announcement Access Code:
      Answer Back Access Code: *42

      Auto Alternate Routing (AAR) Access Code: 8
      Auto Route Selection (ARS) - Access Code 1: 9      Access Code 2:
      Automatic Callback Activation:      Deactivation:
      Call Forwarding Activation Busy/DA: All:      Deactivation:
      Call Park Access Code: *41
```

4.10. Administer Hunt Group and Skill group

Avaya Communication Manager needs to be administered for Automatic Call Distribution (ACD) configuration. This will include hunt groups and skill groups, Agent LoginIDs, call vectors and VDNs.

The following section briefly describes the hunt groups, skill groups and Agent LoginIDs pertinent to the sample configuration. For additional information on ACD configuration, please refer to **Avaya Communication Manager Guide to ACD Call Centers** [3].

For the 911 incoming calls, one hunt group needs to be administered on Avaya Communication Manager. Administer hunt group by entering the “add hunt-group xxx” command, where “xxx” is the hunt group, and not a dialable extension. The hunt group number has a direct relation to skill group number. “xxx” is also the skill group number that will be defined in the agent-loginID screen and queued to in the vector.

Enter the following values for the specified fields, and retain the default values for the remaining fields.

- Group Extension: **Dialable extension of the hunt group**
- Group Type: **ucd-mia** (uniform call distribution – most idle agent)
- COR: **Class of restriction for hunt group**
- ACD: **y**
- Vector: **y**
- Queue: **y**
- Skill: **y**

add hunt-group 15		Page 1 of 3
HUNT GROUP		
Group Number: 15	ACD? y	
Group Name: PlantCML	Queue? y	
Group Extension: 49015	Vector? y	
Group Type: ucd-mia		
TN: 1		
COR: 1	MM Early Answer? n	
Security Code:	Local Agent Preference? n	
ISDN/SIP Caller Display:		
Queue Limit: unlimited		
add hunt-group 15		Page 2 of 3
HUNT GROUP		
Skill? y	Expected Call Handling Time (sec): 180	
AAS? n	Service Level Target (% in sec): 80 in 20	
Measured: internal	Service Objective (sec): 20	
Supervisor Extension: 51001	Service Level Supervisor? n	

4.11. Administer Agent LoginIDs

Administer the 911 answering agents by using the “add agent-loginID xxxxx” (where xxxxx is the extension of the agent). Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Login ID:** Will be populated automatically
- **Name:** A descriptive name
- **Password:** Must use 4 digit numeric password
- **Call Handling Preference:** Enter “skill-level”
- **SN** Enter the hunt group (skill) number
- **SL** Enter appropriate skill level. “1” was used for this testing.

```
add agent-loginID 49010                                     Page 1 of 2
                                AGENT LOGINID

Login ID: 49010                                           AAS? n
Name: PlantCML Agent1                                   AUDIX? n
TN: 1                                                    LWC Reception: spe
COR: 1                                                    LWC Log External Calls? n
Coverage Path:                                           AUDIX Name for Messaging:
Security Code:

LoginID for ISDN/SIP Display? n
Password: *
Password (enter again): *
Auto Answer: station
MIA Across Skills: system
ACW Agent Considered Idle: system
Aux Work Reason Code Type: system
Logout Reason Code Type: system
Maximum time agent in ACW before logout (sec): system
Forced Agent Logout Time:

WARNING: Agent must log in again before changes take effect

add agent-loginID 49010                                     Page 2 of 2
                                AGENT LOGINID

Direct Agent Skill:                                     Service Objective? n
Call Handling Preference: skill-level                    Local Call Preference? n

SN  RL  SL      SN  RL  SL      SN  RL  SL      SN  RL  SL
1: 15   1      16:      31:      46:
2: 16   1      17:      32:      47:
3:      18:      33:      48:
4:      19:      34:      49:
5:      20:      35:      50:
6:      21:      36:      51:
```

Make a note of Login ID and Password for each agent administered to handle 911 calls. This will be needed in **Section 5.7** to administer users on the AES servers.

Repeat the “add agent-loginID xxxx” command to add the desired number of 911 answering agents. For the sample configuration, two 911 call answering agents were administered as shown below:

```
list agent-loginID 49010 count 2
```

AGENT LOGINID									
Login ID	Name/Extension	Dir Agt AAS/AUD	COR	Ag Pr	SO	Skil/Lv	Skil/Lv	Skil/Lv	Skil/Lv
49010	PlantCML Agent1 unstaffed		1	lv1	n	15/01	16/01	/	/
49011	PlantCML Agent2 unstaffed		2	lv1	n	15/01	/	/	/

4.12. Administer Vector and VDNs

The incoming 911 calls will use a Vector Directory Number (VDN). A VDN is a “soft” extension number that is not assigned to an equipment location. VDNs are assigned within the parameters permitted by the customer dial plan analysis table. VDNs point to a vector number. Vectors determine how a specific call should be routed and what call treatment the call should be given. For the sample configuration, the following VDN and Vector were used.

```
display vdn 53015
```

VECTOR DIRECTORY NUMBER									
Page 1 of 3									
Extension: 53015									
Name*: PlantCML HotLine									
Vector Number: 20									
Attendant Vectoring? n									
Meet-me Conferencing? n									
Allow VDN Override? n									
COR: 1									
TN*: 1									
Measured: none									

display vector 20

Page 1 of 6

CALL VECTOR

Number: 20

Name: Bilingual 911

Multimedia? n

Attendant Vectoring? n

Meet-me Conf? n

Lock? n

Basic? y

EAS? y

G3V4 Enhanced? y

ANI/II-Digits? y

ASAI Routing? y

Prompting? y

LAI? y

G3V4 Adv Route? y

CINFO? y

BSR? y

Holidays? y

Variables? y

3.0 Enhanced? y

01 wait-time

0

secs hearing silence

02 collect

1

digits after announcement

58000

for none

03 goto step

5

if digits

=

1

04 goto step

6

if digits

=

2

05 queue-to

skill 15

pri m

06 queue-to

skill 16

pri m

07 stop

08

5. Configure Avaya Application Enablement Services

This section provides the procedures for configuring Avaya Application Enablement Services. The procedures include the following areas:

- Verify Avaya Application Enablement Services License
- Administer local IP
- Administer switch connection
- Administer TSAPI link
- Administer security database
- Obtain Tlink name
- Administer Sentinel users
- Administer device groups
- Restart TSAPI service

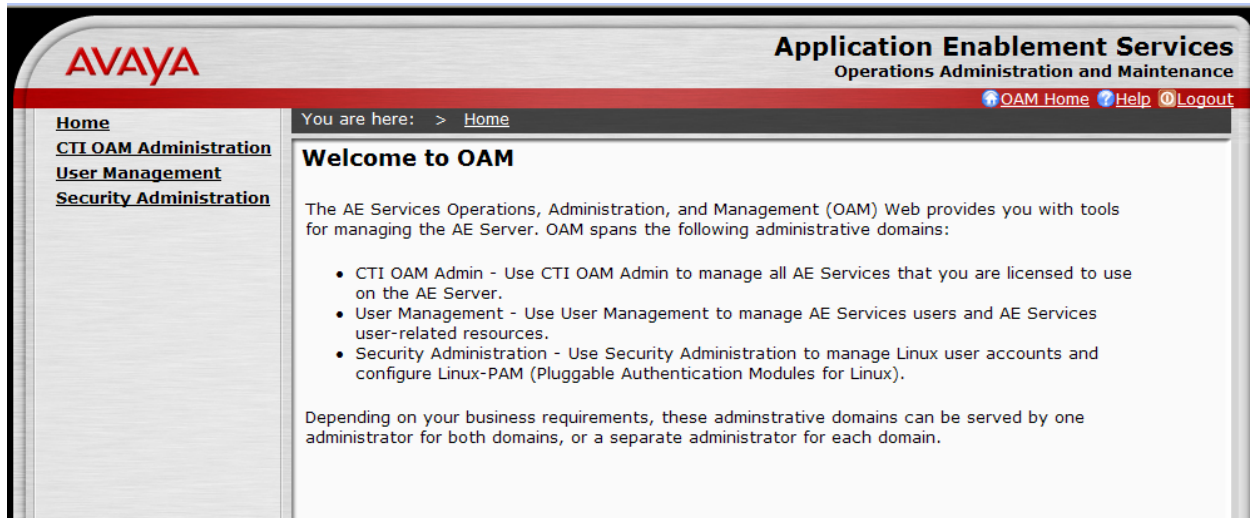
As described in **Section 1.2** and shown in **Figure 2**, two AES servers need to be administered. Administration Steps described in **Section 5.1 to Section 5.9** should be followed for both AES servers.

5.1. Verify Avaya Application Enablement Services License

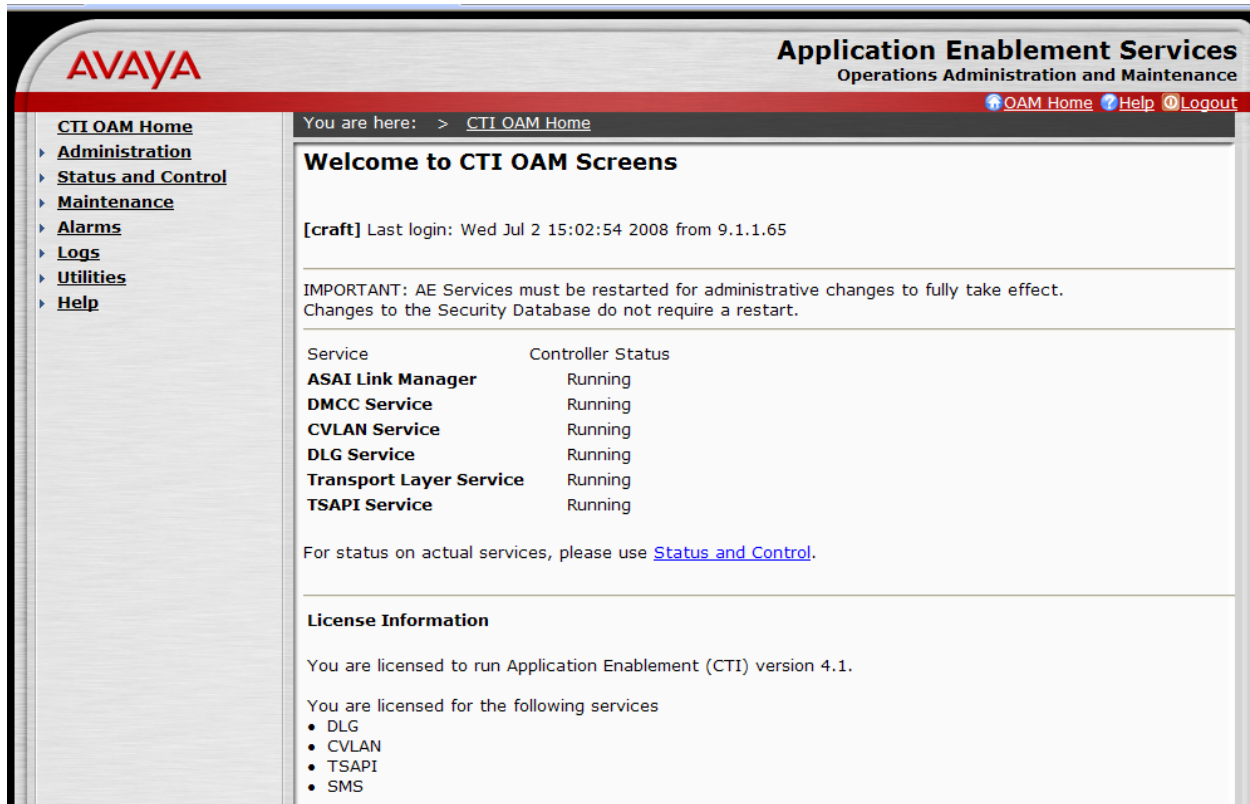
Access the AES OAM web based interface by using the URL “https://ip-address:8443/MVAP” in an Internet browser window, where “ip-address” is the IP address of the AES server. The **Login** screen is displayed as shown below. Note that the AES OAM includes two separate administrative accounts, one to access CTI OAM Admin and a separate one to access User Management. Log in using the CTI OAM Admin user name and password.



The **Welcome to OAM** screen is displayed, as shown below. Select **CTI OAM Administration** from the left pane.

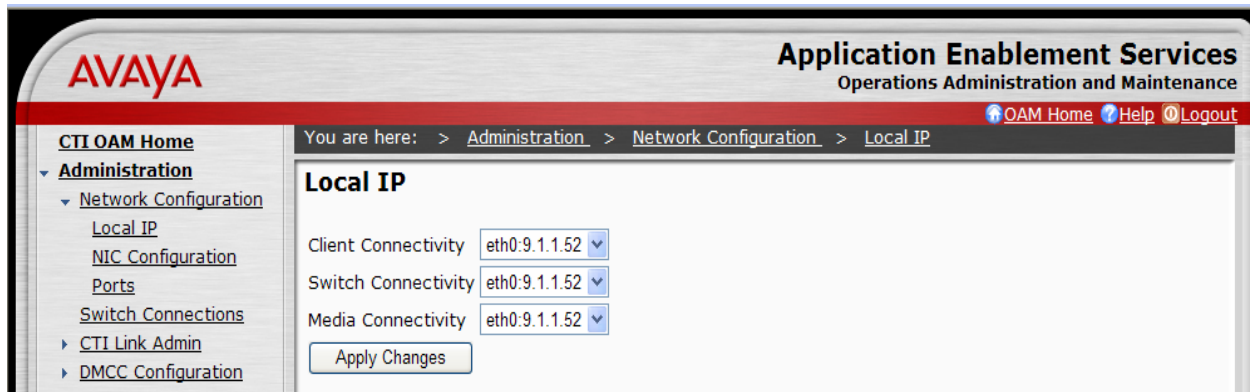


The **Welcome to CTI OAM Screens** is displayed. Verify that AES is licensed for the TSAPI service, as shown below. If the TSAPI service is not licensed, contact the Avaya sales team or business partner for a proper license file.



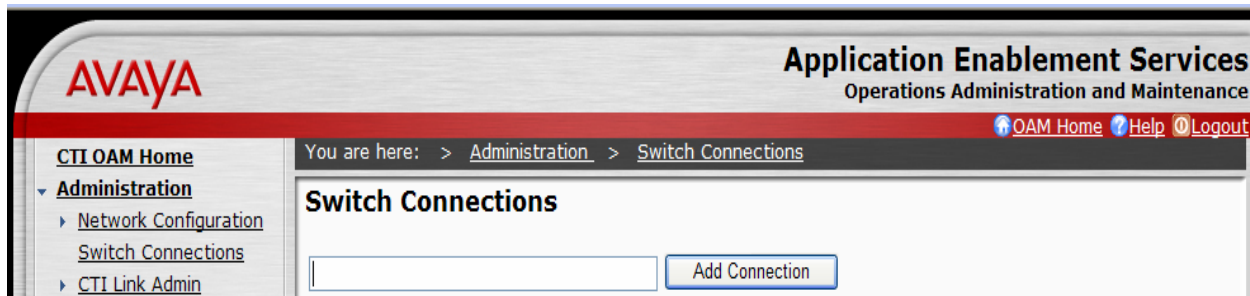
5.2. Administer Local IP

Select **Administration > Network Configuration > Local IP** from the left pane. The **Local IP** screen is displayed into the right pane, as shown below. In the **Client Connectivity** field, select the AES server IP address that will be used to interface to Sentinel server and Sentinel 9-1-1 clients. In the **Switch Connectivity** field, select the AES server IP address that will be used to connect to Avaya Communication Manager. In the sample configuration, the same NIC interface is used for the Client Connectivity and Switch Connectivity. Note that in some cases, they might be different. Click on **Apply Changes**.



5.3. Administer Switch Connection

Select **Administration > Switch Connections** from the left pane. The **Switch Connections** screen is displayed, as shown below. Enter a descriptive name for the switch connection and click on **Add Connection**. In this case, "govaes1" is used. Note that the actual switch connection name may vary.



Next, the **Set Password – govaes1** screen is displayed. Enter the following values for the specified fields:

- **Switch Connection Type:** “CTI/Call Information”
- **Switch Password:** Same password from **Section 4.5**.
- **Confirm Switch Password:** Re-enter the same password from **Section 4.5**.
- **SSL:** Retain the check.

Click on **Apply**.

The screenshot shows the 'Set Password - govaes1' configuration screen. The left sidebar contains a navigation menu with 'Administration' expanded, showing options like 'Network Configuration', 'Switch Connections', 'CTI Link Admin', 'DMCC Configuration', 'TSAPI Configuration', 'Security Database', 'Certificate Management', 'Dial Plan', 'Enterprise Directory', 'Host AA', 'SMS Configuration', and 'Status and Control'. The main content area has a breadcrumb trail 'You are here: > Administration > Switch Connections'. Below this, the title 'Set Password - govaes1' is followed by instructions: 'Please note the following: * A password is not required for a H323 Gatekeeper Connection. * Changing the password affects only new connections, not open connections.' The form includes fields for 'Switch Connection Type' (set to 'CTI/Call Information'), 'Switch Password', and 'Confirm Switch Password'. The 'SSL' checkbox is checked. At the bottom are 'Apply' and 'Cancel' buttons.

The **Switch Connections** screen is displayed next, as shown below. Select the newly added switch connection name from the listing, and click on **Edit CLAN IPs**.

The screenshot shows the 'Switch Connections' screen. The left sidebar is identical to the previous screen. The main content area has a breadcrumb trail 'You are here: > Administration > Switch Connections'. Below this, the title 'Switch Connections' is followed by a search bar and an 'Add Connection' button. A table lists the connections:

Connection Name	Number of Active Connections	Connection Type
govaes1	0	CTI/Call Information

Below the table are four buttons: 'Edit Connection', 'Edit CLAN IPs', 'Edit H.323 Gatekeeper', and 'Delete Connection'.

The **Edit CLAN IPs – govaes1** screen is displayed next. Enter the host name or IP address of the C-LAN used for AES connectivity from **Section 4.2**. Click on **Add Name or IP**.

5.4. Administer TSAPI Link

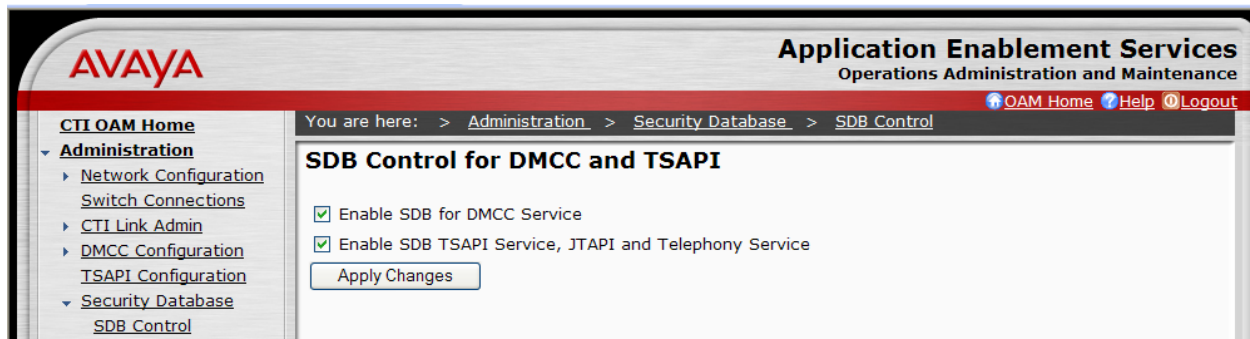
To administer a TSAPI link, select **Administration > CTI Link Admin > TSAPI Links** from the left pane. The **TSAPI Links** screen is displayed, as shown below. Click on **Add Link**.

The **Add / Edit TSAPI Links** screen is displayed next. The **Link** field is only local to the AES server, and may be set to any available number. For **Switch Connection**, select the name of the switch connection from **Section 5.3**. For **Switch CTI Link Number**, select the CTI link number from **Section 4.6**. Accept the default values for **ASAI Link Version** and **Security**. Click on **Apply Changes**.

The **Apply Changes to Link** screen is displayed (not shown). Click on **Apply**.

5.5. Administer Security Database

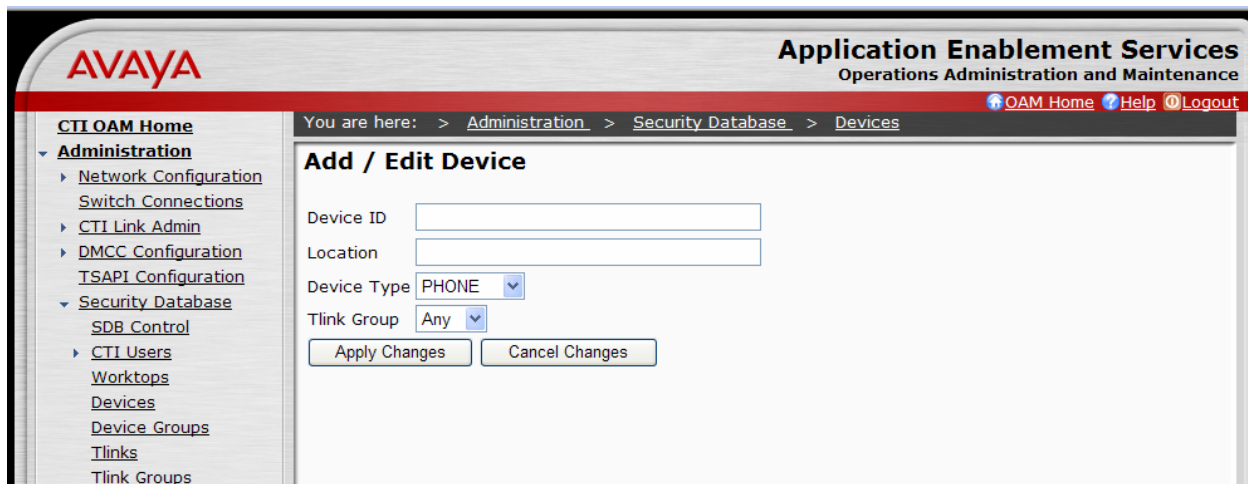
Enable the security database on AES, as this functionality is utilized by Sentinel. Select **Administration > Security Database > SDB Control** to display the **SDB Control for DMCC and TSAPI** screen shown below. Click on **Enable SDB for DMCC Service** and **Enable SDB TSAPI Service, JTAPI and Telephony Service**. Click on **Apply Changes**.



All devices that are monitored and controlled by Sentinel need to be configured in the AES security database. Select **Administration > Security Database > Devices**, and add each device by entering the device extension and clicking on **Add Device**.

The **Add / Edit Device** screen is used to enter the associated field values for each device, as shown below. The following is a description of the device types that are monitored by Sentinel:

- **PHONE:** Station extensions.
- **VDN:** Vector Directory Number extensions.
- **AGENT ID:** Logical agent extensions.



A sample listing of the configured devices used for the compliance testing is shown below. Note that the total number of devices may vary, as this depends on the number of extensions to be monitored and controlled.

AVAYA

Application Enablement Services
Operations Administration and Maintenance

[OAM Home](#)
[Help](#)
[Logout](#)

You are here: > [Administration](#) > [Security Database](#) > [Devices](#)

Devices

	Device ID	Tlink Group	Device Type	Location
<input checked="" type="radio"/>	40004	Any	PHONE	
<input type="radio"/>	40005	Any	PHONE	
<input type="radio"/>	40030	Any	PHONE	
<input type="radio"/>	41007	Any	PHONE	
<input type="radio"/>	41103	Any	PHONE	
<input type="radio"/>	44000	Any	PHONE	
<input type="radio"/>	44004	Any	PHONE	
<input type="radio"/>	49010	Any	AGENT ID	PlantCML Agent1
<input type="radio"/>	49011	Any	AGENT ID	PlantCML Agent2
<input type="radio"/>	53000	Any	PHONE	PlantCML
<input type="radio"/>	53001	Any	PHONE	PlantCML
<input type="radio"/>	53015	Any	VDN	PlantCML VDN

5.6. Obtain Tlink Name

Select **Administration > Security Database > Tlinks** from the left pane. The **Tlinks** screen shows a listing of the Tlink names. A new Tlink name is automatically generated by the AES server, upon creation of a new switch connection. Locate the Tlink Name associated with the newly created switch connection, which would utilize the name of the switch connection as part of the Tlink name. Make a note of the associated Tlink name, to be used later for configuring the Sentinel server.

AVAYA

Application Enablement Services
Operations Administration and Maintenance

[OAM Home](#)
[Help](#)
[Logout](#)

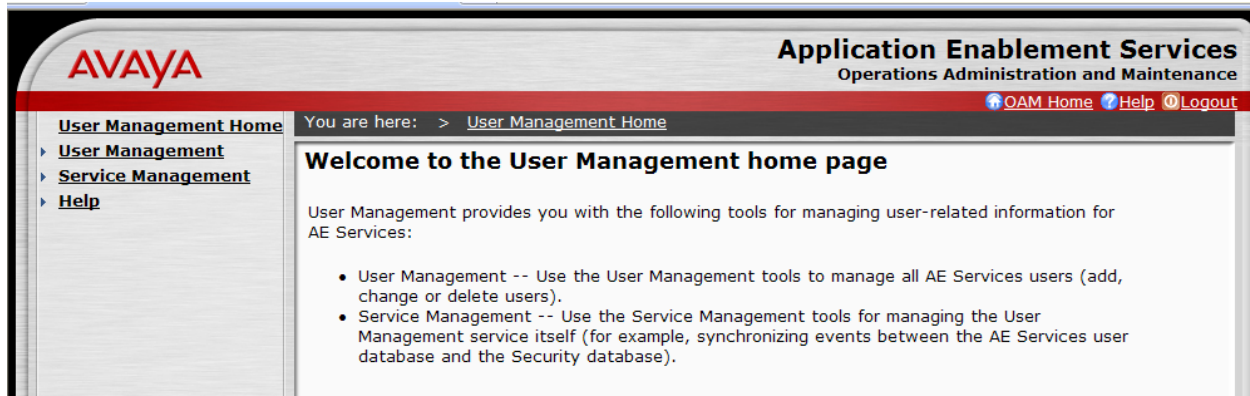
You are here: > [Administration](#) > [Security Database](#) > [Tlinks](#)

Tlinks

Tlink Name
☒ AVAYA#GOVAES1#CSTA#GOVAES1

5.7. Administer Sentinel Users

Administer a user account for the Sentinel servers and a user account for each Sentinel 9-1-1 client/agent. Follow the login procedures in **Section 5.1**, and log in with the User Management user name and password. The **Welcome to the User Management home page** screen is displayed, as shown below.



Select **User Management > Add User** from the left pane. In the **Add User** screen shown below, enter values for the **User Id**, **Common Name**, **Surname**, **User Password**, and **Confirm Password** fields to create a user account for the Sentinel server. Retain the default value of “None” for **Avaya Role**, and select “Yes” from the **CT User** drop-down list. Click on **Apply** at the bottom of the screen (not shown below).

Note: The User Password must be a superset of the Agent ID password to meet the new AES requirements for password. For example, if the Agent ID password is "1234" then the AES User password could be "1234!QZA"

AVAYA

Application Enablement Services

Operations Administration and Maintenance

[OAM Home](#)
[Help](#)
[Logout](#)

User Management Home

User Management

[List All Users](#)
[Add User](#)
[Search Users](#)
[Modify Default User](#)
[Change User Password](#)

Service Management

Help

You are here: > [User Management](#) > [Add User](#)

Add User

Fields marked with * can not be empty.

* User Id

* Common Name

* Surname

* User Password

* Confirm Password

Admin Note

Avaya Role

None

Business Category

Car License

CM Home

Css Home

CT User

No

Department Number

Display Name

Employee Number

Employee Type

Enterprise Handle

Given Name

Repeat this procedure to create a user account for each Sentinel 9-1-1 client/agent, using the Agent-ID and Password from **Section 4.11** as **User Id** and **User Password**. For the sample configuration, two user accounts will be created.

In addition to Sentinel 9-1-1 clients/agents, two additional user accounts need to be created. These are **cmapi** and **sentinel**. These user accounts will be used in **Section 6.1**. All the administered user accounts created for PlantCML Sentinel application are shown below:

AVAYA

Application Enablement Services

Operations Administration and Maintenance

[OAM Home](#)
[Help](#)
[Logout](#)

User Management Home

User Management

[List All Users](#)
[Add User](#)
[Search Users](#)
[Modify Default User](#)
[Change User Password](#)

Service Management

Help

You are here: > [User Management](#) > [Search Users](#)

Search Results

	User Id	Common Name	Surname
<input checked="" type="radio"/>	sentinel	Sentinel	PlantCML
<input type="radio"/>	49010	Agent1	PlantCML
<input type="radio"/>	49011	Agent2	PlantCML
<input type="radio"/>	cmapi	PlantCML	PlantCML

Edit

Delete

Details

List All Matches

Follow the login procedures in **Section 5.1**, and log in with the CTI OAM Admin user name and password. Select **Administration > Security Database > CTI Users > List All Users** to get a listing of all CTI users, as shown below.

AVAYA Application Enablement Services
Operations Administration and Maintenance

You are here: > Administration > Security Database > CTI Users > List All Users

CTI Users

	User ID	Common Name	Worktop Name	Device ID
<input checked="" type="radio"/>	49010	Agent1	NONE	NONE
<input type="radio"/>	49011	Agent2	NONE	NONE
<input type="radio"/>	cmapi	PlantCML	NONE	NONE
<input type="radio"/>	sentinel	Sentinel	NONE	NONE

Edit List All

5.8. Administer Device Groups

Administer a device group to be used by Sentinel, to control user access of devices. Select **Administration > Security Database > Device Groups** from the left pane. In the **Device Groups** screen shown below, enter a descriptive value, and click on **Add Device Group**.

AVAYA Application Enablement Services
Operations Administration and Maintenance

You are here: > Administration > Security Database > Device Groups

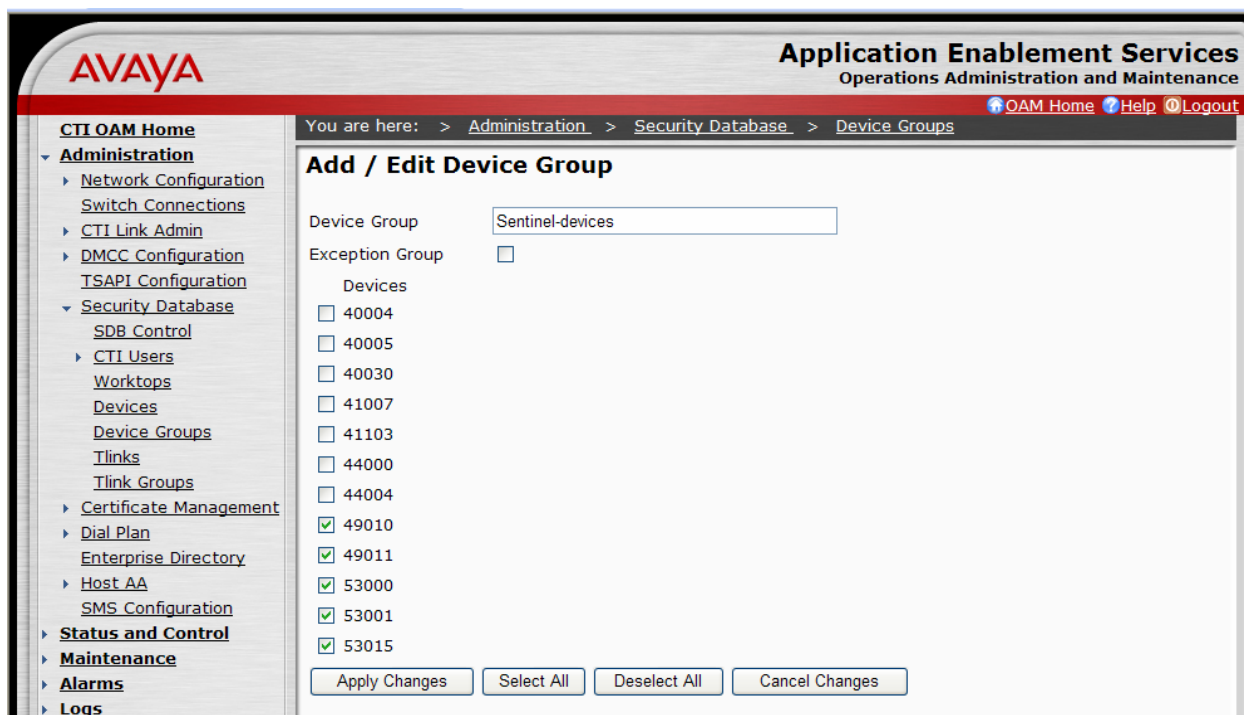
Device Groups

Device Group Exception Group?

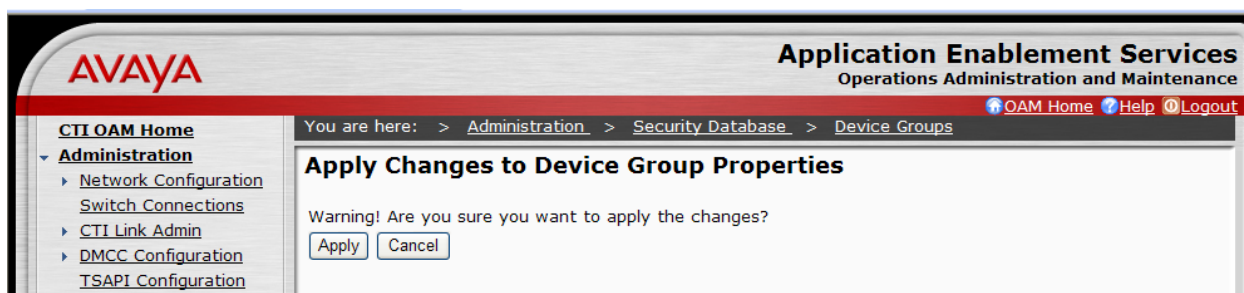
Add Device Group

Edit Device Group Delete Device Group

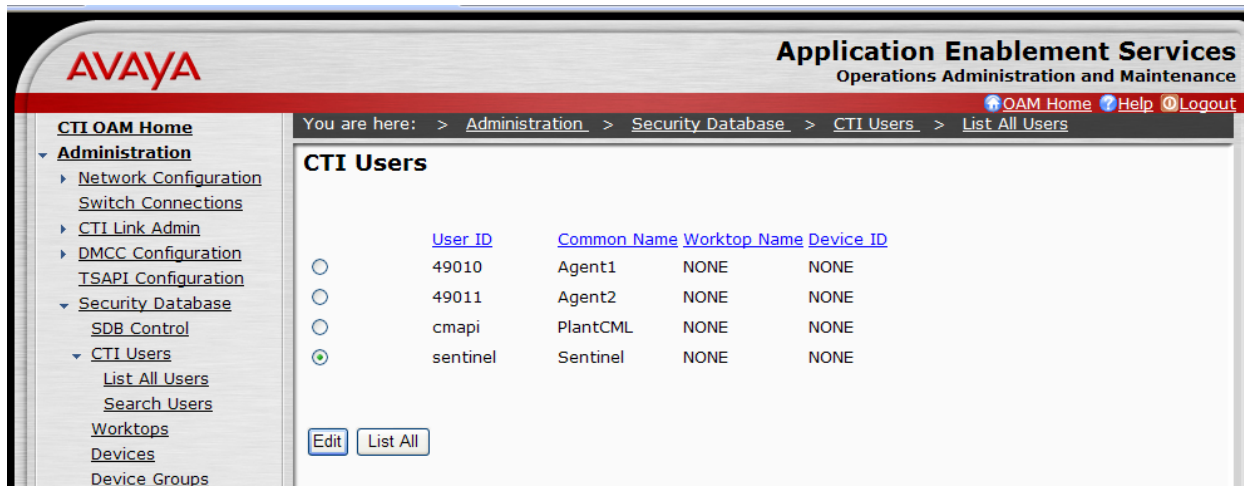
For the sample configuration, a device group of “Sentinel-devices” was created. Click on **Edit Device Group**. The **Add / Edit Device Group** screen is displayed, as shown below. Select all devices that were created in **Section 5.5**, and click on **Apply Changes**.



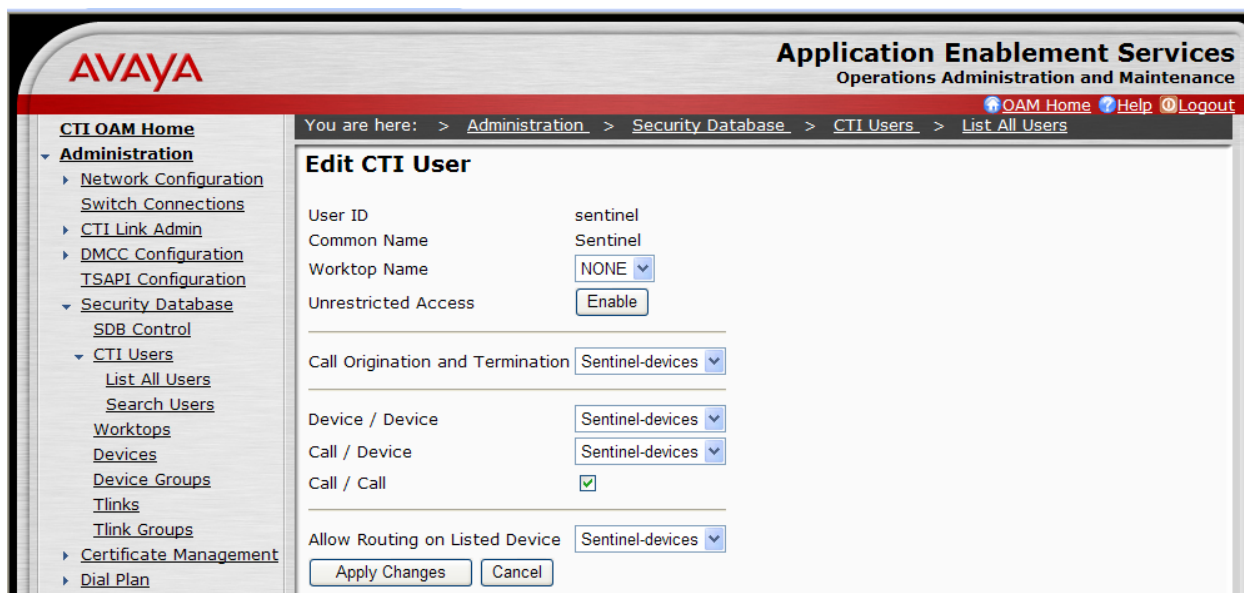
The **Apply Changes to Device Group Properties** screen is displayed next. Click on **Apply** to confirm the changes.



Select **Administration > Security Database > CTI Users > List All Users** to view the listing of all CTI users again, as shown below. Select the user ID created for the Sentinel server, and click on **Edit**. In this case, “sentinel”.



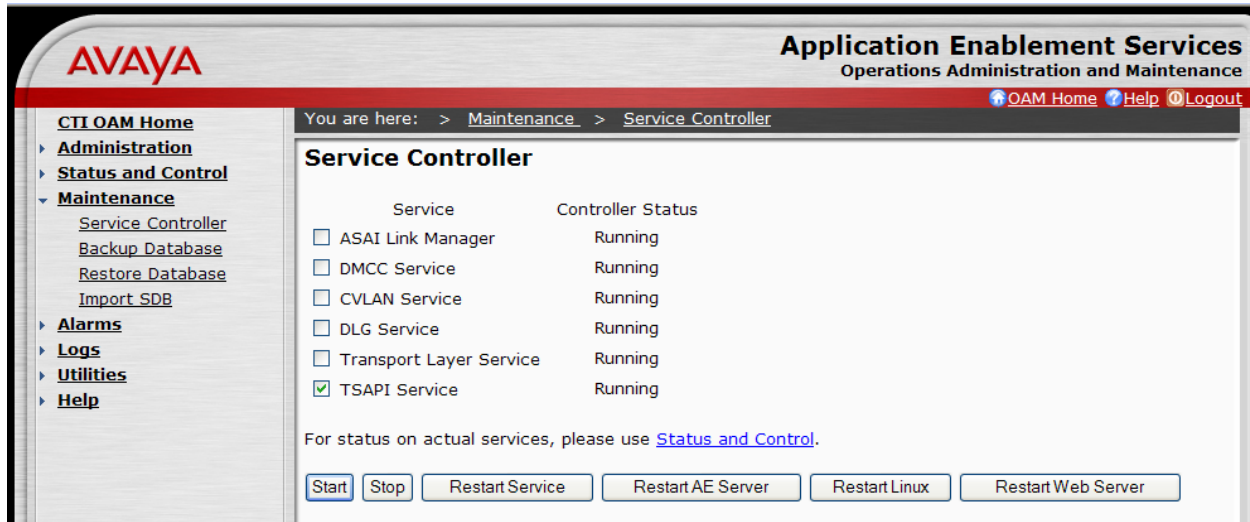
The **Edit CTI User** screen is displayed, as shown below. Select the newly created device group for the **Call Origination and Termination**, **Device / Device**, **Call / Device**, and **Allow Routing on Listed Device** fields. Click on **Call / Call**, followed by **Apply Changes**.



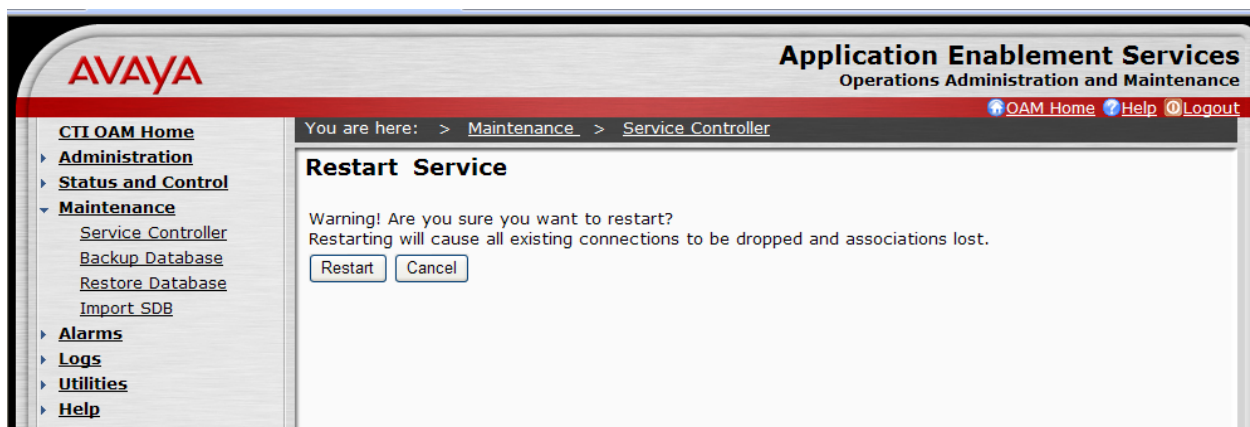
Repeat this procedure for all CTI users listed in the **CTI Users** screen above – “49010”, “49011” and “cmapi”.

5.9. Restart TSAPI Service

Select **Maintenance > Service Controller**. The **Service Controller** screen shows a listing of the services and associated status. Check the **TSAPI Service**, and click on **Restart Service**.



The following **Restart Service** screen is displayed. Click on **Restart** to confirm the restart.



5.10. Administer Second AES Server

As described in **Section 1.2** and shown in **Figure 2**, two AES servers need to be administered. Repeat steps described in **Section 5.1** to **Section 5.9** to configure the second AES server. For the sample configuration, repeat the steps for “goveaes2”.

6. Configure PlantCML Sentinel Server

This section provides the procedures for configuring the PlantCML Sentinel CM servers. The procedures include the following areas:

- Administer Sentinel Server Configuration
- Launch Sentinel server configurator
- Administer global settings
- Restart CallP Manager
- Administer Sentinel clients
- Verify Sentinel Accounts
- Administer trunks

This section assumes that Sentinel CM software has already been installed on the two servers.

For the sample configuration, use the following in the **Name** and **IP Address**. The actual name and IP address may vary.

Sentinel CM Servers	
Name	IP Address
Server-A	9.1.1.25
Server-B	9.1.1.26

6.1. Administer Sentinel Server Configuration

On the first sentinel server (on Server-A), select **Start → Control Panel**. Double click on the **Sentinel Server** icon. The Sentinel Server Configuration screen will appear.

- Enter the **IP address** of the two Avaya AES servers. For the sample configuration, enter “9.1.1.51” and “9.1.1.52” (from **Section 5.2**).
- For the **CTI (TSAPI)**, enter the user ID and password created for the Sentinel servers from **Section 5.7**.
- For the **TLink** field, enter the Tlink name noted in **Section 5.6**. Two TLinks need to be entered, one for each Avaya AES server.
- For the **CMAPI**, enter the user ID and password created in **Section 5.7**. Maintain the default value for Port Number.
- Click on Network Adapters tab.
- For the **Peer Server Connection**, select **Static IP addresses** and enter the IP address of the second sentinel server (Server-B).
- Click on **OK** at the bottom of the screen.

Sentinel Server Configuration

Avaya AES Configuration Network Adapters

Avaya Application Enablement Server

AES A - IP Address 9 . 1 . 1 . 51

AES B - IP Address 9 . 1 . 1 . 52

CTI (TSAPI)

User sentinel

Password xxxxxxxx

Primary TLink AVAYA#GOVAES2#C

Secondary TLink S1#CSTA#GOVAES1

CMAPI

User cmapi

Password xxxxxxxx

Port Number 4721

OK Cancel Apply

Sentinel Server Configuration

Avaya AES Configuration Network Adapters

Device Name

HP NC373i Multifunction Gigabit Server Adapter

Add

Remove

Up

Down

Peer Server Connection

☐ Multicast discovery

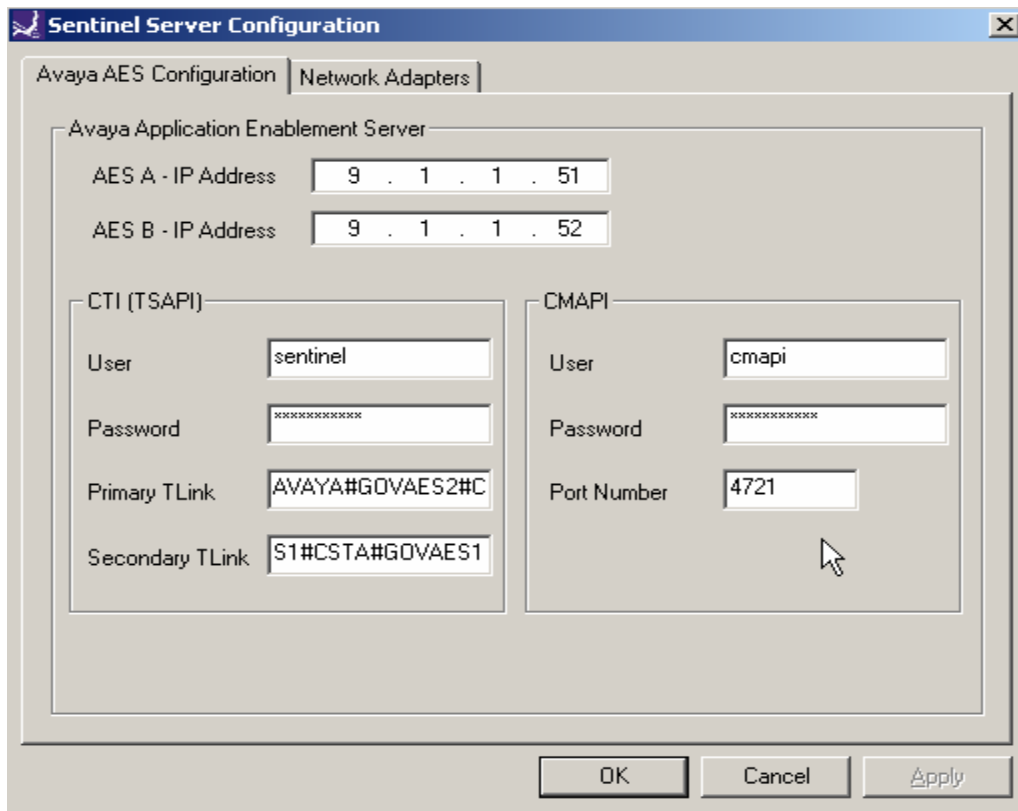
☒ Static IP addresses

IP Address: 9 . 1 . 1 . 26

Port: 7000

OK Cancel Apply

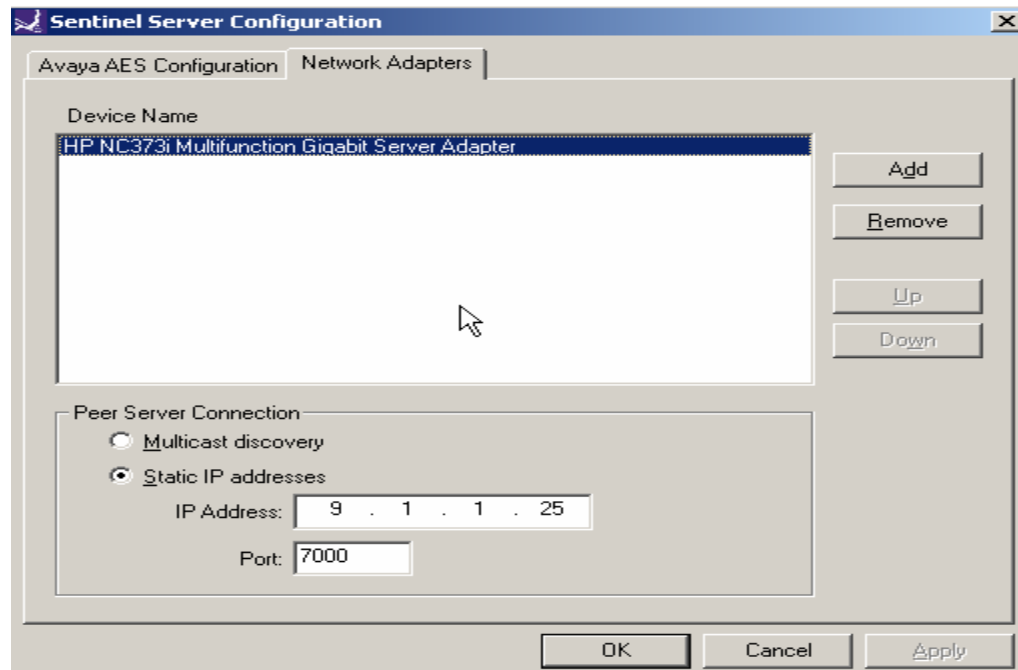
On the second sentinel server, select **Start → Control Panel**. Double click on the **Sentinel Server** icon. The Sentinel Server Configuration screen will appear. The screens below show the values entered for the sample configuration.



The screenshot shows the 'Sentinel Server Configuration' window with the 'Avaya AES Configuration' tab selected. The 'Network Adapters' sub-tab is also active. The configuration includes:

- Avaya Application Enablement Server:**
 - AES A - IP Address: 9 . 1 . 1 . 51
 - AES B - IP Address: 9 . 1 . 1 . 52
- CTI (TSAPI):**
 - User: sentinel
 - Password: [masked]
 - Primary TLink: AVAYA#GOVAES2#C
 - Secondary TLink: S1#CSTA#GOVAES1
- CMAPI:**
 - User: cmapi
 - Password: [masked]
 - Port Number: 4721

Buttons at the bottom: OK, Cancel, Apply.



The screenshot shows the 'Sentinel Server Configuration' window with the 'Network Adapters' sub-tab selected. The configuration includes:

- Device Name:** HP NC373i Multifunction Gigabit Server Adapter
- Peer Server Connection:**
 - ☐ Multicast discovery
 - ☒ Static IP addresses
 - IP Address: 9 . 1 . 1 . 25
 - Port: 7000

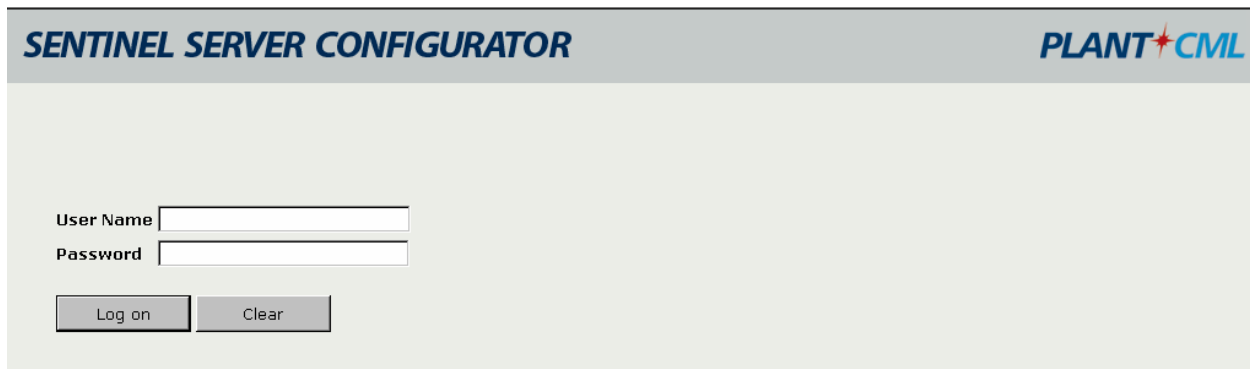
Buttons on the right: Add, Remove, Up, Down.

Buttons at the bottom: OK, Cancel, Apply.

6.2. Launch Sentinel Server Configurator

Access the Sentinel server web based interface by using the URL “http://<ip-address>/Configurator” in an Internet browser window, where “ip-address” is the IP address of the Sentinel active server. The screen below is displayed. Log in with proper administrative credentials.

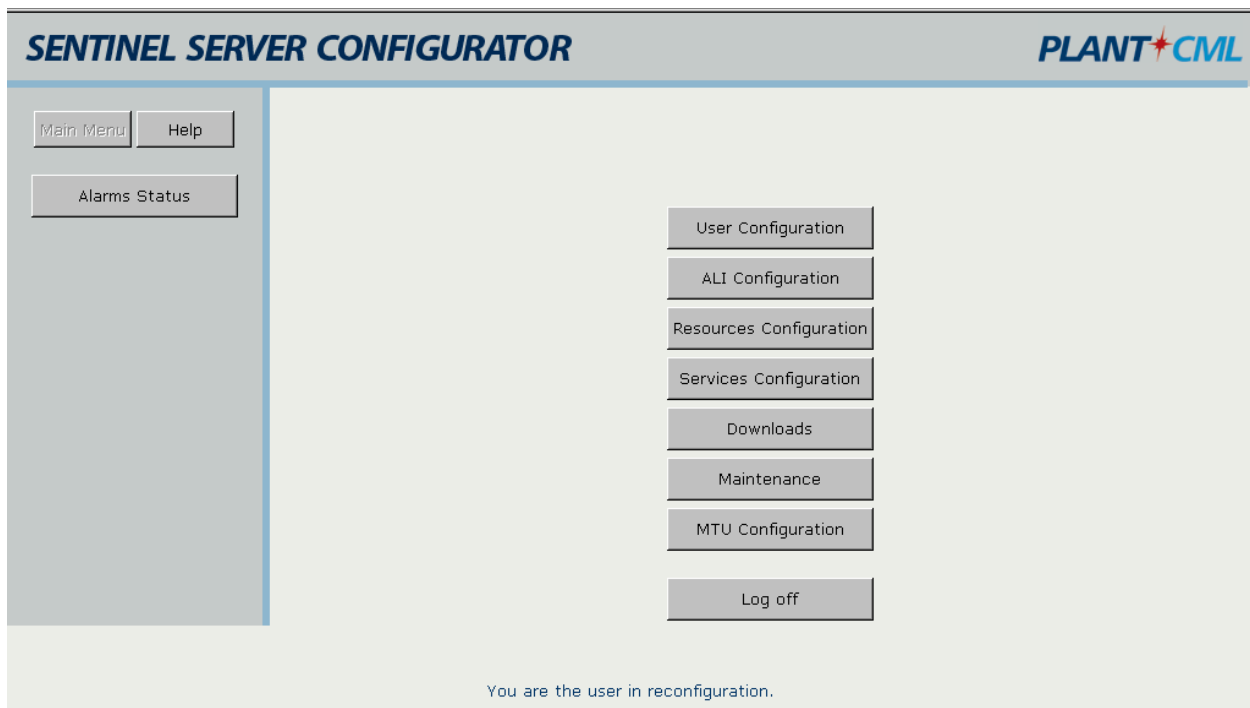
Note that the configuration steps described in **Section 6.2 to Section 6.8** are performed on the active server only. The backup server will automatically synch up with the primary server.



The image shows the login screen of the Sentinel Server Configurator. At the top, there is a header bar with the text "SENTINEL SERVER CONFIGURATOR" on the left and the "PLANT CML" logo on the right. Below the header, there is a login form with two input fields: "User Name" and "Password". Below these fields are two buttons: "Log on" and "Clear".

6.3. Administer Global Settings

The screen below is displayed next. Click on **Resources Configuration**.



The image shows the main menu of the Sentinel Server Configurator. At the top, there is a header bar with the text "SENTINEL SERVER CONFIGURATOR" on the left and the "PLANT CML" logo on the right. Below the header, there is a sidebar on the left with three buttons: "Main Menu", "Help", and "Alarms Status". To the right of the sidebar, there is a vertical stack of buttons: "User Configuration", "ALI Configuration", "Resources Configuration", "Services Configuration", "Downloads", "Maintenance", "MTU Configuration", and "Log off". At the bottom of the screen, there is a status message: "You are the user in reconfiguration."

The **Global Setting Details** screen is displayed. Enter the Server A Name, Server B Name and Server Group as shown below. Click on **Save** at the top of the screen.

SENTINEL SERVER CONFIGURATOR **PLANT**★**CML**

Main Menu Help

Global Settings

- Feature Access Codes
- Aux Works Definitions
- CLAN Card Configuration
- Groups**
- CAD Port
- CDR
- ALI Discrepancy
- Dedicated Data Port
- Dial Out Data Port
- Lines

Global Settings Details

Save

Sentinel Server

Server A Name

Server B Name

Server Group

Instant Messaging

Port Number Interconnectivity

Select **Feature Access Codes** in the left pane. Enter the corresponding feature access code for Call Park and Answer Back Access Code from **Section 4.9**, in **Park** and **Unpark** fields. Click on **Save** at the top of the screen.

SENTINEL SERVER CONFIGURATOR **PLANT**★**CML**

Main Menu Help

Global Settings

- Feature Access Codes**
- Aux Works Definitions
- CLAN Card Configuration

Feature Access Codes

Save

Park

Unpark

Select **Aux Works Definitions** in the left pane. Enter appropriate **Code** and **Description**. Click on **Add**.

SENTINEL SERVER CONFIGURATOR **PLANT**★**CML**

Main Menu Help

Global Settings

- Feature Access Codes
- Aux Works Definitions**
- CLAN Card Configuration

Aux Works Definitions

(There are 1 Aux Works defined. The limit is 9.)

Code	Description
<input type="text" value="1"/>	<input type="text" value="Break"/>

Add Clear Save Delete

Select **CLAN Card Configuration** in the left pane. Enter the IP address for the C-LAN module. Click on **Add**.

The screenshot shows the 'SENTINEL SERVER CONFIGURATOR' interface. On the left, a navigation pane lists several options: Global Settings, Feature Access Codes, Aux Works Definitions, **CLAN Card Configuration** (which is selected), Groups, CAD Port, CDR, and ALI Discrepancy. The main window is titled 'CLAN Card Configuration'. It contains a label 'IP Address' above a text input field. To the right of the input field are two buttons: 'Add' and 'Clear'.

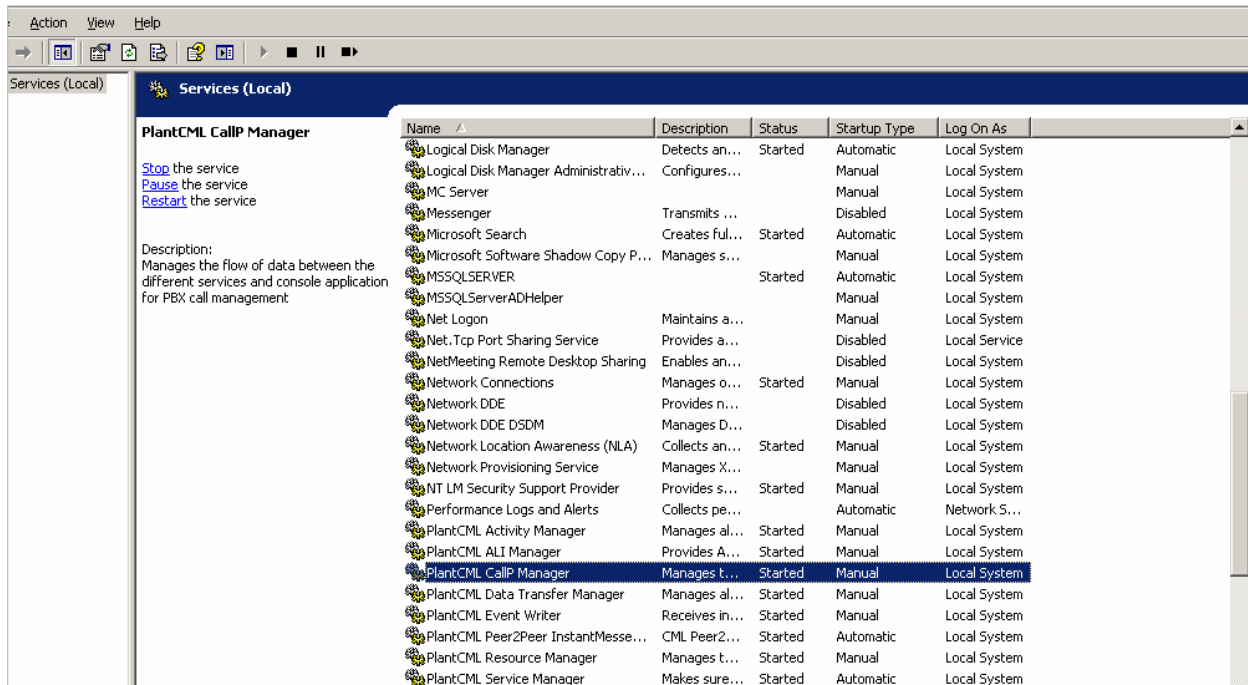
For the sample configuration, two C-LAN modules are used. The screen below displays the C-LAN modules administered.

This screenshot shows the same 'SENTINEL SERVER CONFIGURATOR' interface, but now with two C-LAN modules configured. The left navigation pane remains the same. In the main 'CLAN Card Configuration' area, the 'IP Address' input field and 'Add'/'Clear' buttons are still present. Below them, a list of configured modules is shown. Each module entry consists of an IP address followed by 'Delete' and 'Disable' buttons. The listed modules are 9.1.1.8 and 9.1.1.9.

IP Address	Delete	Disable
9.1.1.8	Delete	Disable
9.1.1.9	Delete	Disable

6.4. Restart CallP Manager

From the Sentinel active server, restart the CallP Manager by selecting **Start > Control Panel > Administrative Tools > Services**. Right click on **PlantCML CallP Manager**, and select “Restart” from the drop down list. After restarting the CallP Manager, the Sentinel application will establish connectivity to Avaya AES and start querying on device information administered in the AES security database.



6.5. Administer Sentinel Clients

Use the procedures in **Sections 6.2** to bring up an Internet browser window to log back into the Sentinel server. Select **Resources Configuration**. Select **Phones** from the left pane.

The **Phone Configuration** screen is displayed, and contains a listing of the “PHONES” device type obtained from Avaya AES. For each phone entry below, select “Sentinel” from the **Type** drop down list. This will allow the phone to be used as a Sentinel 9-1-1 client. Enter a more descriptive name into the **Label** field if desired, as shown below. Click the corresponding **Save** button after making changes for each phone entry.

SENTINEL SERVER CONFIGURATOR
PLANTCML

Main Menu

Help

- ☐ Global Settings
- ☐ Groups
- ☐ CAD Port
- ☐ CDR
- ☐ ALI Discrepancy
- ☐ Dedicated Data Port
- ☐ Dial Out Data Port
- ☐ Lines
- ☒ **Phones**
- ☐ STA
- ☐ ESN

Phone Configuration

Phone Extension	Label	Type	Group		
53000	53000	Sentinel	PHONES	Save	Details
53001	53001	Sentinel	PHONES	Save	Details

To view the Phone details, click on Details button. It is recommended to populate the **Phone IP (Optional)** field if static IP addresses are used for 911 call answering agents IP Phones. Click on **Save** button if any changes were made to the Phone Details.



SENTINEL SERVER CONFIGURATOR **PLANT CML**

Main Menu Help

- ☐ Global Settings
- ☐ CDR
- ☐ ALI Discrepancy
- ☐ Groups
- ☐ CAD Port
- ☐ Dedicated Data Port
- ☐ Dial Out Data Port
- ☐ Lines
- ☒ **Phones**
- ☐ STA
- ☐ ESN

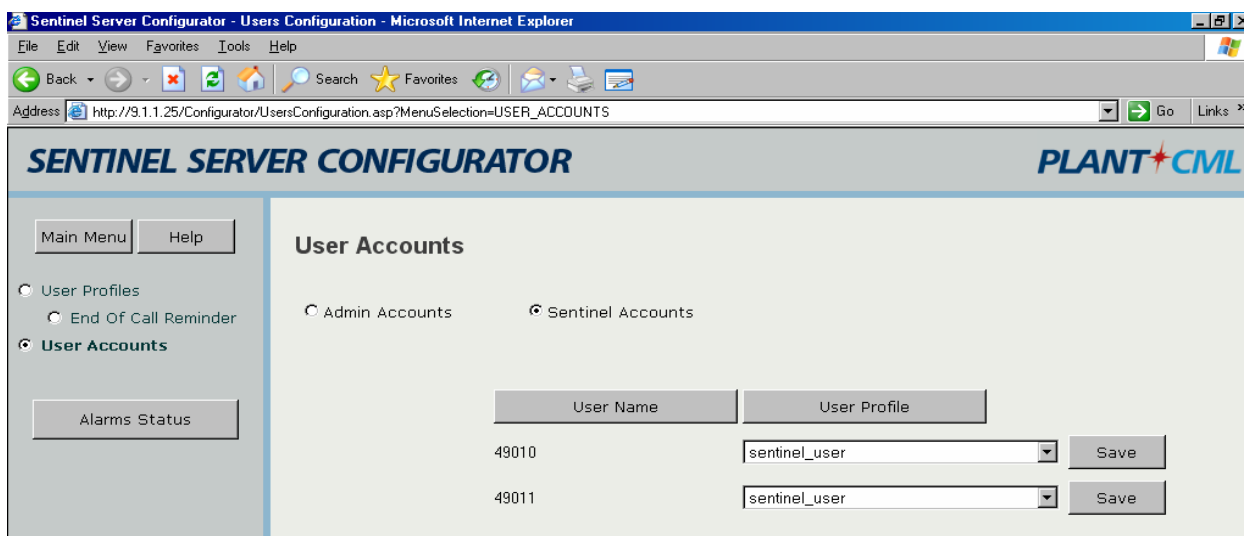
Phone Details

Save

Extension 53000
ID 53000
Label 53000
Phone Interface Sentinel
Group PHONES
CAD Group None
ALI Print Out None
Phone Type IP Phone
Phone IP (Optional) 9.1.1.103

6.6. Verify Sentinel Accounts

From the main menu select **User Configuration**. Select **User Accounts** and click on **Sentinel Accounts**. Verify the Agents created in **Section 4.11** are listed here. Assign the **User Profile** “sentinel_user” for each agent from the pull down menu. Click the corresponding **Save** button after making changes for each phone entry.



SENTINEL SERVER CONFIGURATOR **PLANT CML**

Main Menu Help

- ☐ User Profiles
- ☐ End Of Call Reminder
- ☒ **User Accounts**

Alarms Status

User Accounts

☐ Admin Accounts ☒ Sentinel Accounts

User Name	User Profile	
49010	sentinel_user	Save
49011	sentinel_user	Save

6.7. Selective Transfer Agencies Configuration

Select **STA** from the left pane to administer information for pre-programmed buttons. These can be used for outside agencies like Police, Fire or EMS. This is an optional step.

SENTINEL SERVER CONFIGURATOR **PLANT CML**

Main Menu Help

Selective Transfer Agencies Configuration

(There are 3 STAs defined. The limit is 6000.)

Index	Label	Circuit Type	Number	Information		
					Add	Clear
1	POLICE	Intercom	51002	Lincroft Police	Save	Delete
2	FIRE	Intercom	51001	Lincroft Fire	Save	Delete
3	EMS	Intercom	51001	Lincroft EMS	Save	Delete

1

6.8. Administer Trunks

Select **Lines** from the left pane to administer information for the trunks on Avaya Communication Manager used for carrying the incoming 911 calls. An entry needs to be entered for each trunk used on Avaya Communication Manager. For the sample configuration, a trunk group number of “1” with “10” group members was created on Avaya Communication Manager for carrying the incoming 911 calls. Therefore ten such entries would need to be created. Create each entry with the following values:

- **Trunk Group:** Trunk group number for 911 calls, in this case “1”.
- **Trunk Member:** A sequential number starting with “1”.
- **Label:** A descriptive name.
- **ALI Group:** Select the appropriate ALI group from the drop down list.
- **Line Type:** Select “Emergency” from the drop down list.
- **Group:** Select “TRUNK” from the drop-down list.

Note that the **ALI Group** selection may vary. In the compliance testing, an internal database was used to obtain the ALI information, which corresponded to “ALI Group 1”. The setting of “Emergency” in the **Line Type** field enables the Sentinel server to identify the call priority and to provide any desired call treatment, such as sending special audio alerts to the answering agents. Click the corresponding **Save** button to the right of each entry to submit the entry.

The screen below shows the first 6 trunks that were created for testing.

SENTINEL SERVER CONFIGURATOR

PLANTCML

Main Menu

Help

Global Settings

Groups

CAD Port

CDR

ALI Discrepancy

Dedicated Data Port

Dial Out Data Port

Lines

Phones

STA

ESN

Alarms Status

Line Configuration

Trunk Group	Trunk Member	Label	ALI Group	Line Type	Ringback Code	Group
			None	Administrative		LINES
1	1	Line 1	ALI Group 1	Emergency		TRUNK
1	2	Line 2	ALI Group 1	Emergency		TRUNK
1	3	Line 3	ALI Group 1	Emergency		TRUNK
1	4	Line 4	ALI Group 1	Emergency		TRUNK
1	5	Line 5	ALI Group 1	Emergency		TRUNK
1	6	Line 6	ALI Group 1	Emergency		TRUNK

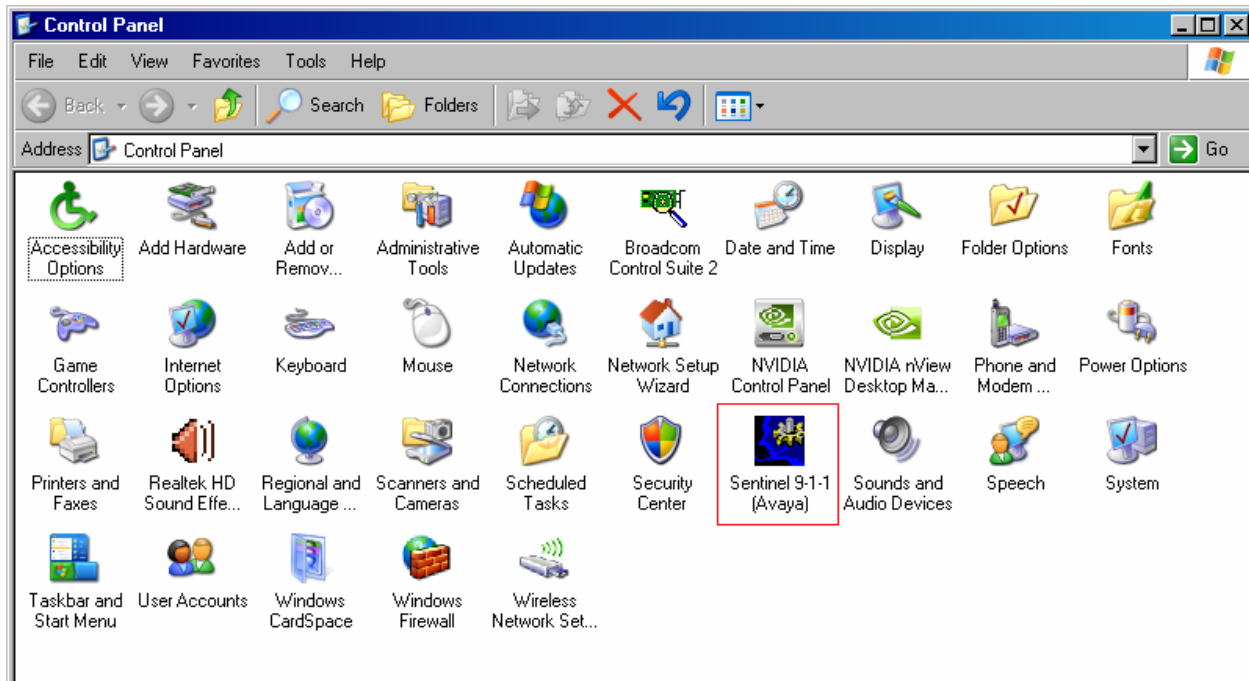
7. Configure PlantCML Sentinel 9-1-1 Clients

This section provides the procedures for configuring the PlantCML Sentinel 9-1-1 clients. The procedures include the following areas:

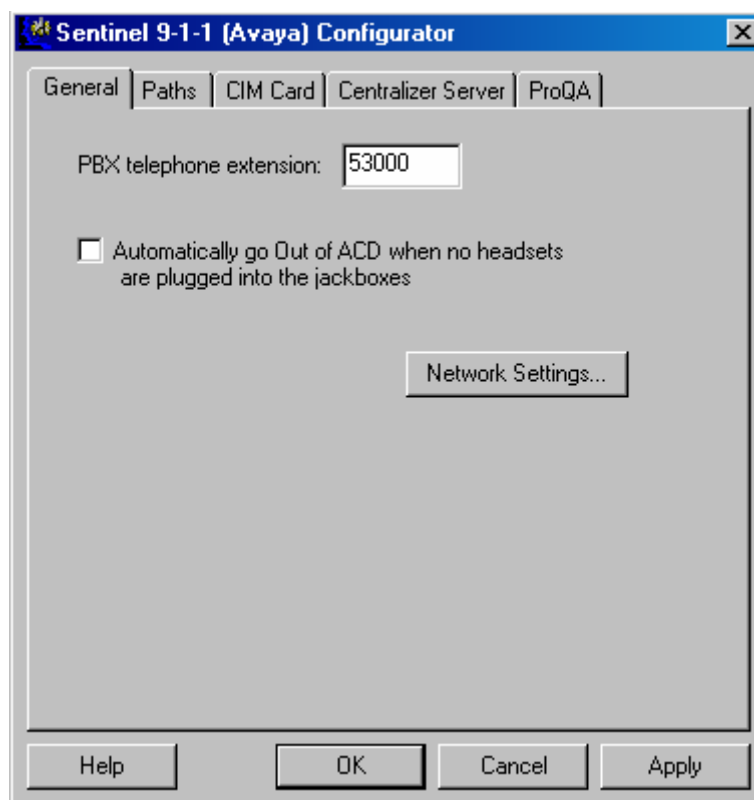
- Administer physical extension
- Log into logical extension
- Administer user configuration file

7.1. Administer Physical Extension

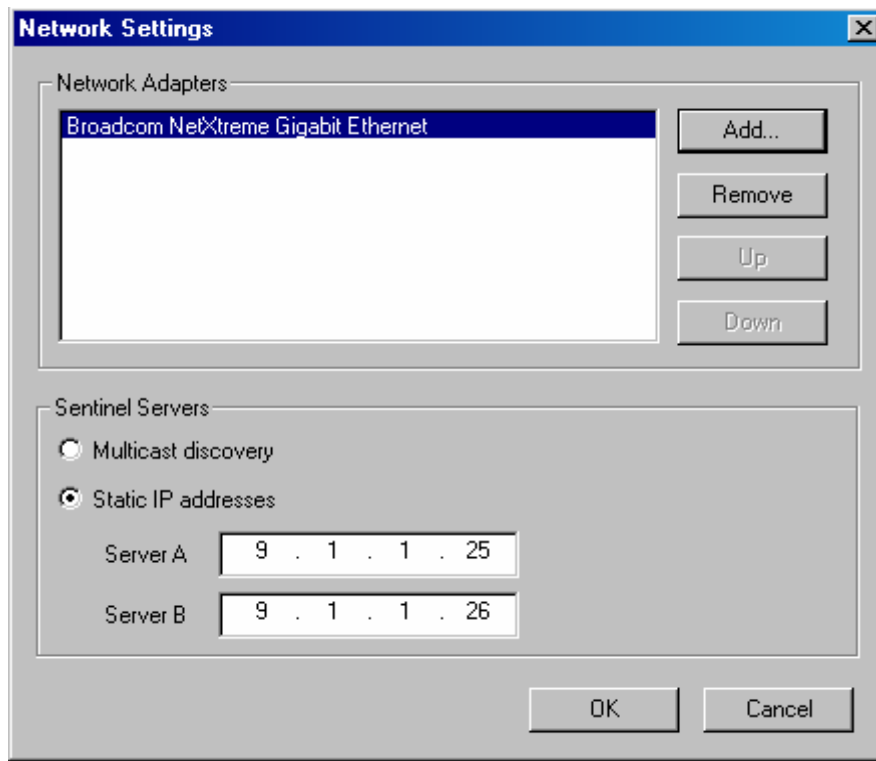
From each Sentinel 9-1-1 client PC, select **Start > Control Panel** to bring up the **Control Panel** screen. Double click on the **Sentinel 9-1-1 (Avaya)** icon, which was created as part of the **PlantCML Sentinel 9-1-1** installation.



The **Sentinel 9-1-1 (Avaya) Configurator** screen is displayed. Enter the extension associated with the agent's physical telephone from **Section 4.7**, and click on **Network Settings**.

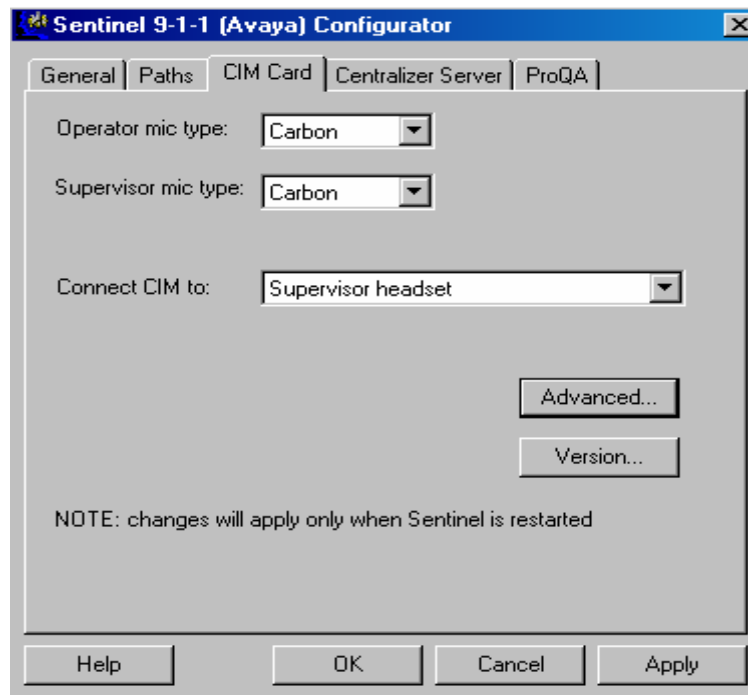


The **Network Settings** screen is displayed next. Select **Static IP addresses** and enter the IP addresses for Sentinel Server A and Sentinel Server B, and click **OK**.



The **Network Settings** dialog box is shown. It has a title bar with a close button. The main area is divided into two sections. The top section, **Network Adapters**, contains a list box with **Broadcom NetXtreme Gigabit Ethernet** selected. To the right of the list box are four buttons: **Add...**, **Remove**, **Up**, and **Down**. The bottom section, **Sentinel Servers**, contains two radio buttons: **Multicast discovery** (unselected) and **Static IP addresses** (selected). Below the radio buttons are two rows of IP address input fields. The first row is for **Server A** with the value **9 . 1 . 1 . 25**. The second row is for **Server B** with the value **9 . 1 . 1 . 26**. At the bottom right are **OK** and **Cancel** buttons.

From the **Sentinel 9-1-1 (Avaya) Configurator** screen, click on **CIM Card** tab.



The **Sentinel 9-1-1 (Avaya) Configurator** dialog box is shown. It has a title bar with a close button. The main area has five tabs: **General**, **Paths**, **CIM Card** (selected), **Centralizer Server**, and **ProQA**. The **CIM Card** tab contains three dropdown menus: **Operator mic type:** (set to **Carbon**), **Supervisor mic type:** (set to **Carbon**), and **Connect CIM to:** (set to **Supervisor headset**). Below these are two buttons: **Advanced...** and **Version...**. At the bottom is a note: **NOTE: changes will apply only when Sentinel is restarted**. At the very bottom are four buttons: **Help**, **OK**, **Cancel**, and **Apply**.

Click the **Advanced ...** button. Set the parameters as shown below and click **OK**.

	Tx Gain (dB)	Rx Gain (dB)
Port1 (Loop Start/ Supervisor phone)	10	0
Port2 (Supervisor headset/ Radio bypass)	0	0
Port3 (Operator phone)	-10	0
Port4 (Operator headset)	-6	0
Port5 (4 wire)	0	-10
Port6 (Sound card Left)	0	0
Port7 (Sound card Right)	0	0
DTMF tones	-12	
TTY tones	-16	

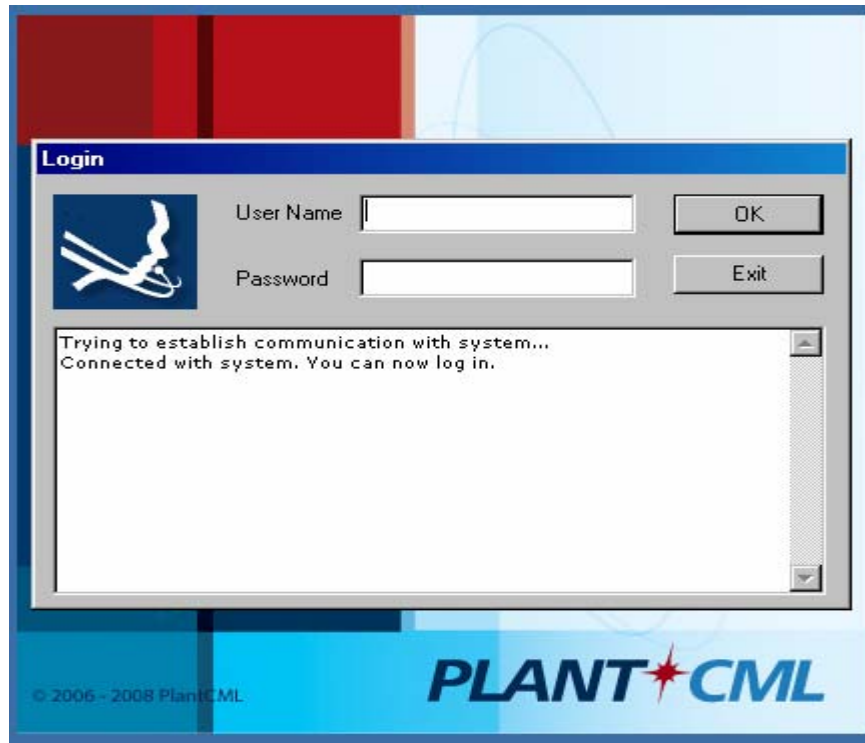
OK Cancel

7.2. Log Into Logical Extension

From the agent desktop, double click the **Sentinel** icon shown below. This icon is created as part of the **PlantCML Sentinel 9-1-1** installation.



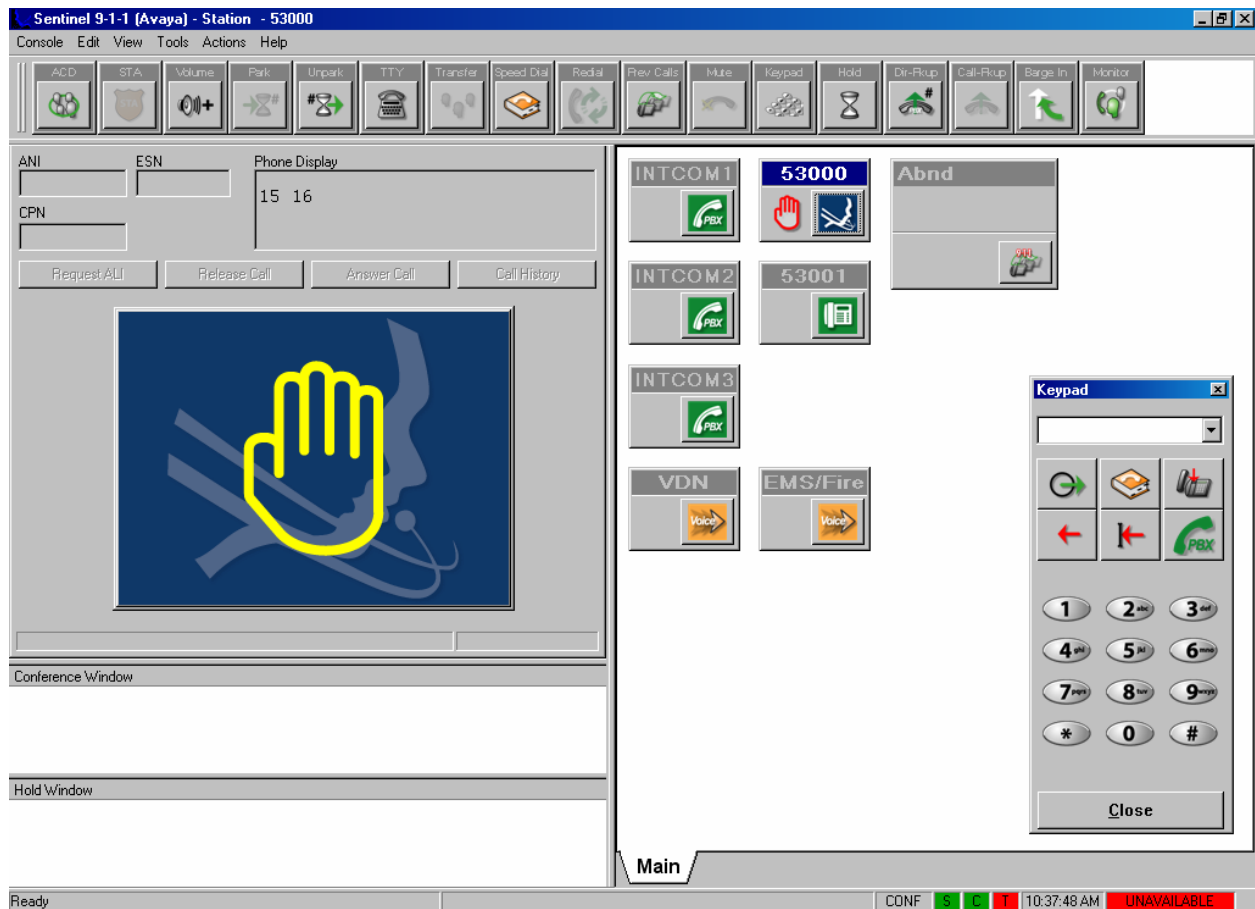
The **Sentinel 9-1-1 Login** screen is displayed. Enter a logical agent extension and associated password administered on Avaya Application Enablement Services from **Section 5.7**. Click **OK**.



7.3. Administer User Configuration File

Upon initial log in, the **User Configuration** screen (not shown) will be displayed. The **User name** field is automatically populated with the agent's physical telephone extension from **Section 7.1**. Click on **Browse** and navigate to **C: → Program Files → PlantCML → Sentinel 9-1-1-Avaya → Ini** folder and select "**avayalab.cfg**" file. Click **OK**. The avayalab.cfg file contains the configuration information for the Sentinel GUI layout.

The **Sentinel 9-1-1 (Avaya) – Station** screen is displayed as shown below. From this point on, the agent can customize his/her desktop using options under **Console > Preferences > Desktop**. Refer to the Sentinel documentation in **Section 14** for how to customize the graphical user interface, such as creating icons for call related actions, and specifying the fonts for the icons.



8. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing scenarios focused on the integration of PlantCML Sentinel CM with Avaya Communication Manager via Avaya AES. The specific tests include the following areas:

- Queue 911 incoming calls
- Answer, hold, transfer, conference calls to PSAP agents.
- Monitor / Barge-in / Service Observing / Whisper-page interactions
- Call park, and call pickup interactions

The serviceability testing focused on verifying the ability of Sentinel to recover from adverse conditions, such as:

- S8720 Server interchanges / Reset
- Busyout C-LANs and CTI links
- Server Redundancy and Fail-over of the PlantCML Sentinel servers
- Workstation Scenarios – PC fails

8.1. General Test Approach

All the test cases were performed manually. Upon start of the Sentinel application, the application automatically queries Avaya Communication Manager for VDN/agent status and requests monitoring. Incoming 911 calls were made to the monitored VDNs. Call controls from both the agent desktop and the agent telephones were exercised to verify event reports associated with features such as conferencing and transferring of calls.

The serviceability test cases were performed by busying out and releasing the CTI link, and by disconnecting and reconnecting the LAN cables to the Sentinel server and to the Sentinel 9-1-1 clients.

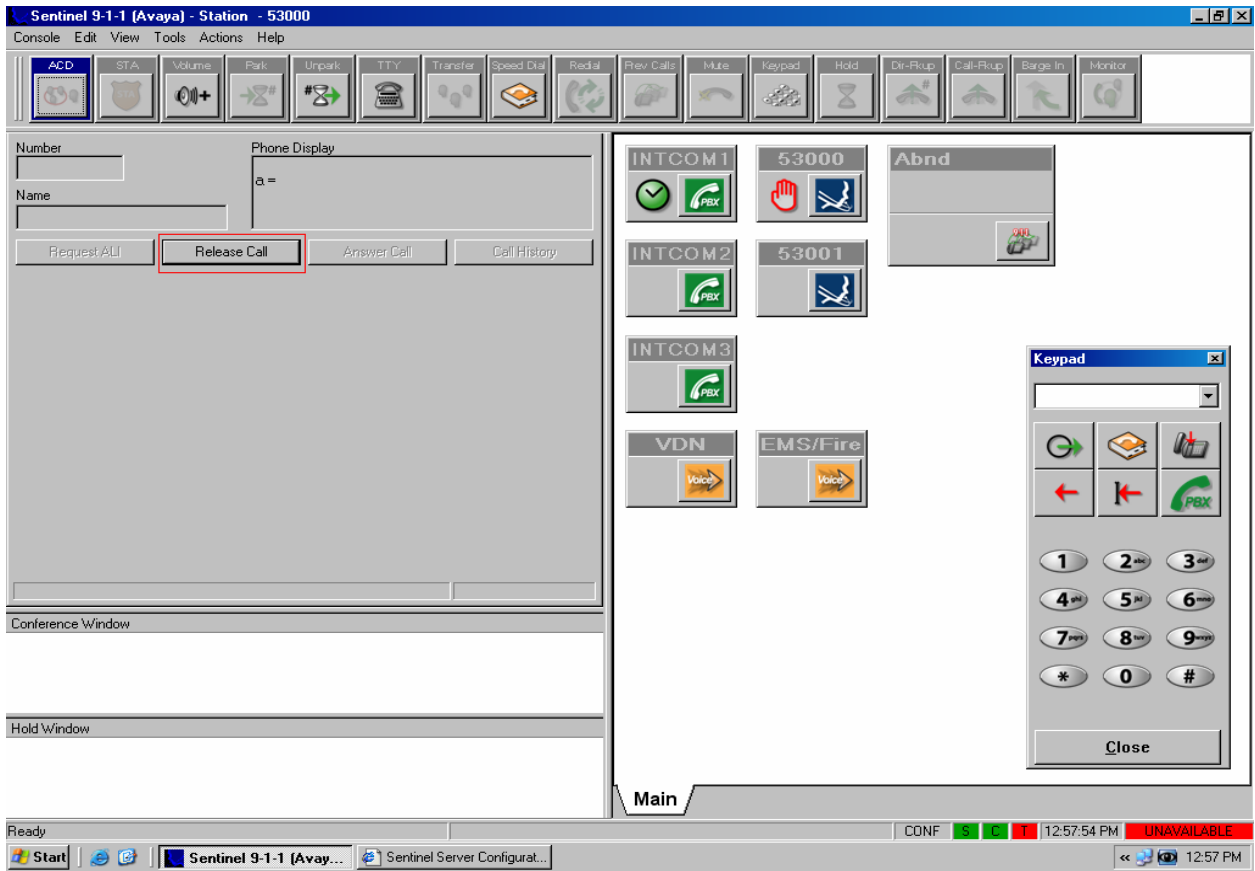
The verification of all tests included checking of proper states at the telephone sets, and Sentinel 9-1-1 clients.

8.2. Test Results

All feature test cases were executed and passed.

Few observations were made during testing which are noted below:

1. Display for conferencing is different on 4600 Series phones and 9600 Series phones. For a 3-party conference, the 4600 Series Phones will show “3-party Conference in progress” and 9600 Series Phone will show “CONFERENCE 2”.
2. No Service Observing Tones are heard when a 911 Agent monitors or barge-in a call in progress using the Sentinel 9-1-1 application
3. It is recommended to use the Sentinel 9-1-1 application to log-in, change ACD states, log-out, call-park and call pickup. Avaya Communication Manager Feature Access Codes (FAC) should only be used when the Sentinel 9-1-1 application is not available.
4. The 911 call answering agents should not be equipped to handle multiple incoming calls. The Sentinel 9-1-1 application does not support this feature. By default, Multiple ACD Calls is set to “N”.
5. It is recommended to have a NTP timing source for Sentinel applications to synchronize. If NTP timing is not configured, a batch file needs to be installed on Sentinel servers which will synchronize the servers on a regular basis (like every hour).
6. The 911 Agent needs to enable the “headset” button on the Avaya IP Telephones. A call will be launched when the agent activates the “headset” button on the IP phone. The 911 Agent will need to release the call from the Sentinel 9-1-1 as shown below:



9. Verification

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager, Avaya Application Enablement Services, and PlantCML Sentinel server and Sentinel 9-1-1 clients.

9.1. Verify Avaya Communication Manager

On Avaya Communication Manager, verify the status of the administered CTI links by using the “status aesvcs cti-link” command. Verify that the **Service State** is “established” for the CTI link numbers administered in **Section 4.6**, as shown below.

```
status aesvcs cti-link
```

AE SERVICES CTI LINK STATUS						
CTI Link	Version	Mnt Busy	AE Services Server	Service State	Msgs Sent	Msgs Rcvd
1	4	no	govaes1	established	672	672
2	4	no	govaes2	established	15	15
3		no		down	0	0

Verify the status of the agent registration by using the “list registered-ip-stations” command. Verify that there are two entries for each station, one for IP station and another for PlantCML Sentinel 9-1-1 application that will use the Device, Media and Call Control API via Avaya AES to register the agent/client softphone.

```
list registered-ip-stations ext 53000 count 2
```

REGISTERED IP STATIONS							
Station Ext/ Orig Port	Set Type	Product ID	Prod Rel	Station IP Address	Net Rgn	Gatekeeper IP Address	TCP Skt
53000	4620	IP_Phone	2.8300	9.1.1.103	1	9.1.1.9	Y
53000	4620	IP_API_A	3.2040	9.1.1.52	1	9.1.1.8	Y
53001	9630	IP_Phone	1.5000	9.1.1.104	1	9.1.1.9	Y
53001	9630	IP_API_A	3.2040	9.1.1.52	1	9.1.1.8	Y

9.2. Verify Avaya Application Enablement Services

On Avaya AES, verify the status of the switch connection by selecting **Status and Control > Switch Conn Summary** from the left pane. Verify that the **Conn State** is “Talking” for the switch connection administered in **Section 5.3**, as shown below.

AVAYA Application Enablement Services
Operations Administration and Maintenance

You are here: > [Status and Control](#) > [Switch Conn Summary](#)

Switch Connections Summary

Switch Conn	Conn State	Since	Online/Offline	Active CLANS/ Admin'd CLANS	# of TCI Conns	Msgs To Switch	Msgs From Switch	Msg Period
govaes1	Talking	2008-06-29 15:57:21.0	Online	1 / 1	2	1338	691	30

[Per Service Switch Connections Details](#)

Verify the status of the TSAPI link by selecting **Status and Control > Services Summary** from the left pane. Click on **TSAPI Service**, followed by **Details** (not shown below). The **TSAPI Link Details** screen is displayed. Verify the **Conn Status** is “Talking” for the TSAPI link administered in **Section 5.4**, as shown below.

AVAYA

Application Enablement Services
Operations Administration and Maintenance

CTI OAM Home
Administration
Status and Control
Switch Conn Summary
Services Summary
Maintenance
Alarms
Logs
Utilities
Help

You are here: > Status and Control > Services Summary

TSAPI Link Details

Link	Switch Conn Name	Switch CTI Link Number	Conn Status	Since	Service State	Switch Version	Number of Associations	ASAI Message Rate
1	govaes1	1	Talking	2008-06-29 15:57:21.0	Online	15	3	684

9.3. Verify PlantCML Sentinel Server and Sentinel 9-1-1 Client

Make an incoming 911 call, and verify the available agent is alerted by a visual flashing **9-1-1** display on the desktop and a siren sound on the headset. Click on the **Answer Call** icon or the **9-1-1** display.

Sentinel 9-1-1 (Avaya) - Station - 53000

Console Edit View Tools Actions Help

ACD STA Volume Park Unpark TTY Transfer Speed Dial Redial Rev Calls Mute Keypad Hold Dir-Rup Call-Rup Barge In Monitor

ANI ESN Phone Display
CPN
a=John Doe to
PlantCML HotLin

Request All Release Call Answer Call Call History

9-1-1

Conference Window

Hold Window

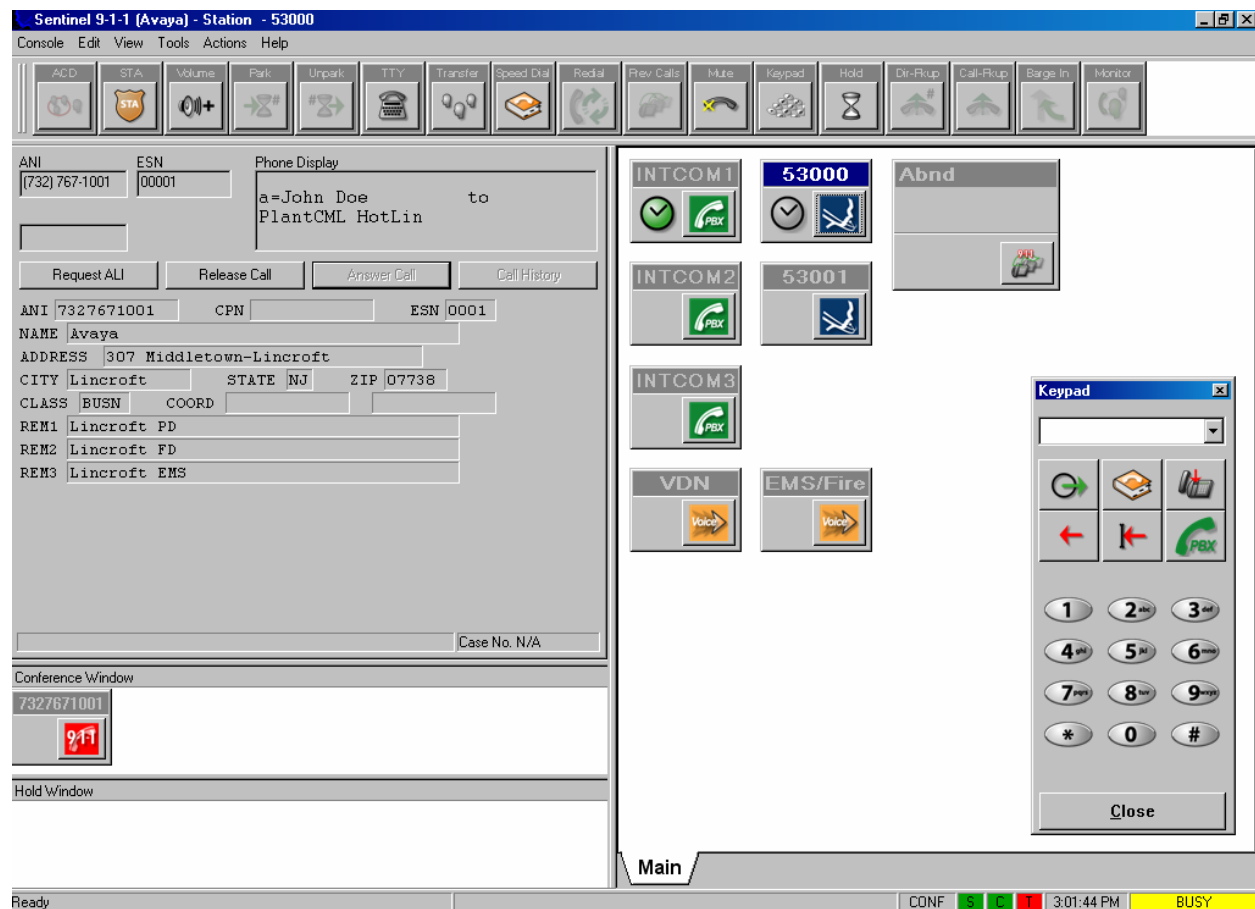
INTCOM1 53000 Abnd
INTCOM2 53001
INTCOM3
VDN EMS/Fire

Keypad
1 2 3
4 5 6
7 8 9
* 0 #
Close

Main

Ready CONF 3:01:12 PM BUSY

Verify the agent is connected to the caller with two-way talk paths, and that the agent screen is populated with the caller ANI and ALI information, as shown below.

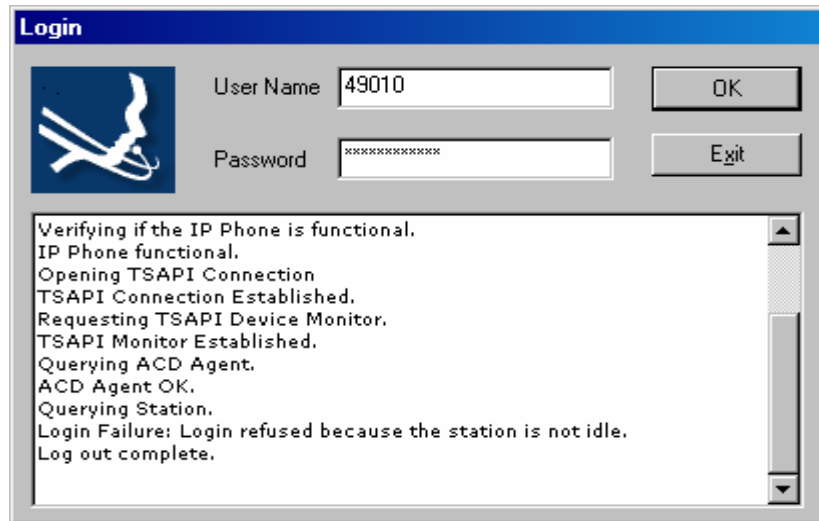


10. Troubleshooting

This section offers some common configuration mismatches to assist in troubleshooting.

10.1. Sentinel 9-1-1 Cannot Login

The 911 Agent cannot login to the Sentinel 9-1-1 Application if the station/agent is on an active call. Following Login Failure screen will appear.



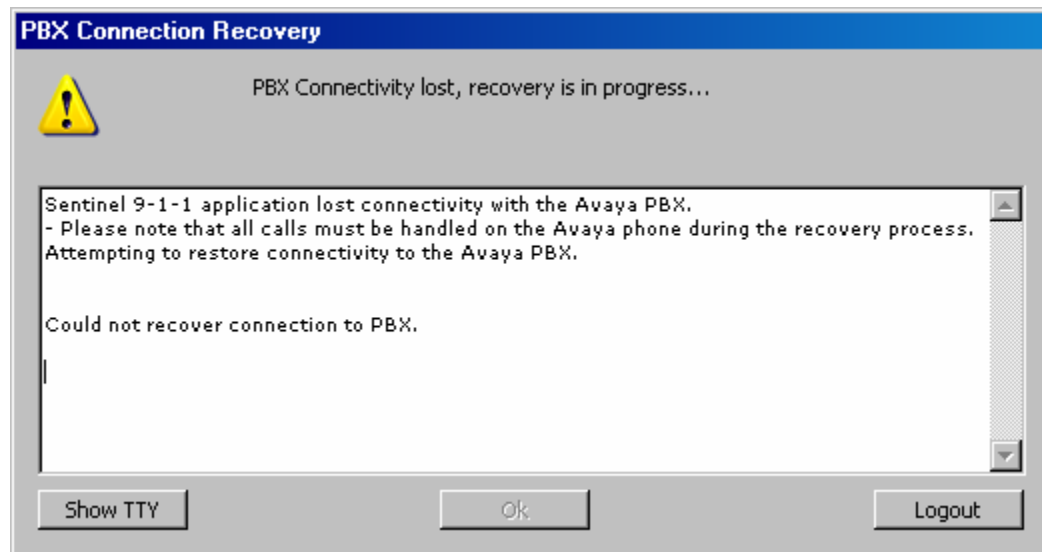
10.2. Incorrect User Name or Password

Following Login Failure screen will appear if incorrect User Name or Password is entered during the Sentinel 9-1-1 application login process. The **User Name** should match the “Agent Login ID” administered in **Section 4.11**. The **Password** should match “password” for the agent.

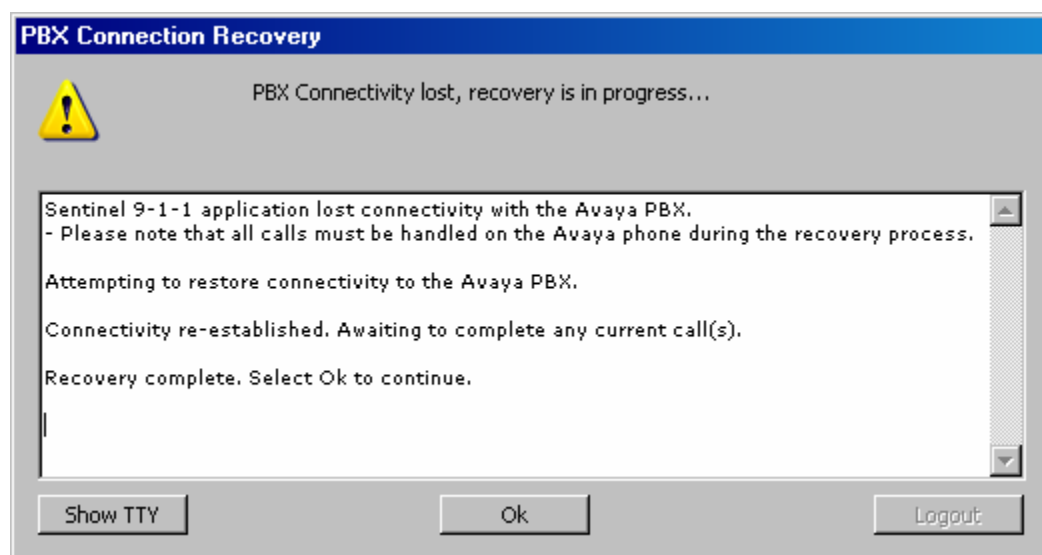


10.3. PBX Connectivity lost

When the Sentinel 9-1-1 Application loses PBX connectivity, a PBX Connection Recovery dialog box will appear. In some cases, the Sentinel 9-1-1 Application is not able to recover and will require the agent to log back into the Sentinel Application as shown below:



In other scenarios, the Sentinel 9-1-1 Application is able to recover and the agent will not have to log back into the Sentinel Application. Clicking Ok will enable the agent to continue, as shown below:



11. Terminology

AES	Avaya Application Enablement Services
ALI	Automatic Location Information
ANI	Automatic Number Identification
CAMA	Centralized Automated Message Accounting
DMCC	Device, Media and Call Control
IWS	Intelligent Workstation
NENA	National Emergency Number Association
PSAP	Public Safety Answering Point
SES	SIP Enablement Services
TSAPI	Telephony Services Application Programming Interface

12. Support

Technical support on PlantCML Sentinel can be obtained through the following:

- **Temecula:** (800) 491-1734
- **Gatineau:** (800) 265-8325

13. Conclusion

These Application Notes describe the configuration steps required for PlantCML Sentinel to successfully interoperate with Avaya Communication Manager Release 5.0 and Avaya Application Enablement Services Release 4.1.

14. Additional References

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

1. *Administrator Guide for Avaya Communication Manager*, Document 03-300509, Issue 2, January 2008, available at <http://support.avaya.com>.
2. *Avaya Application Enablement Services 4.1 Administration and Maintenance Guide*, Document ID 02-300357, Issue 1, January 2008, available at <http://support.avaya.com>.
3. *Avaya Communication Manager Guide to ACD Call Centers*, Document ID 555-230-716, Issue 1, January 2008, available at <http://support.avaya.com>
4. *Sentinel CM – Operations and Maintenance Guide*, Issue 1.0, September 2008, available at <http://www.peinc.com>

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