



Avaya Solution & Interoperability Test Lab

Application Notes for Integrated Research PROGNOSIS IP Telephony Manager with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the procedures for configuring Integrated Research PROGNOSIS IP Telephony Manager to interoperate with Avaya Communication Manager.

PROGNOSIS IP Telephony Manager is a performance management solution for multi-vendor IP telephony solutions. PROGNOSIS IP Telephony Manager provides visibility of Avaya and other vendor's IP Telephony solutions from a single console. Targeted at Managed Service Providers of IP telephony solutions, PROGNOSIS IP Telephony Manager offers a multi-customer, multi-PBX perspective, enabling a significant reduction in complexity when managing multiple IP Telephony vendors.

PROGNOSIS integrates directly to Avaya Communication Manager using Secure Shell (SSH). At the same time, it processes Real-time Transport Control Protocol (RTCP) information from Avaya Communication Manager and Avaya IP Telephones.

Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the compliance-tested configuration used to validate Integrated Research PROGNOSIS IP Telephony Manager 9.0.0 with Avaya Communication Manager 3.1.2.

The PROGNOSIS IP Telephony Manager is based on the PROGNOSIS product-family architecture for the scalable monitoring of business critical systems. The PROGNOSIS product consists of:

- One or more **PROGNOSIS Monitoring Nodes** (Server Nodes). These are servers used by the PROGNOSIS product to collect, relay and store information collected from the monitored systems. In some case the monitoring node may actually exist as an agent running on the monitored system but in the case of Avaya Communication Manager, all monitoring nodes are separate servers.
- The **PROGNOSIS GUI** is a Microsoft Windows client program which is used to connect to a PROGNOSIS monitoring node and display the information collected by the monitoring node. The PROGNOSIS GUI may either be installed on a monitoring node or on a separate computer.

The PROGNOSIS IP Telephony Manager product uses two methods to monitor an Avaya Communication Manager system.

- **System Access Terminal (SAT)**

The PROGNOSIS IP Telephony Manager uses a pool of threads to establish SSH connections to the SAT using the IP address of the media servers. By default, the solution attempts to establish three concurrent SAT connections to an Avaya Communication Manager system. The solution uses the connections to execute SAT commands on the media server.

- **RTCP Collection**

The PROGNOSIS IP Telephony Manager collects RTCP information sent by Avaya Communication Manager IP Media Processor boards, media gateways and IP Telephones.

Figure 1 illustrates the sample configuration used to verify Integrated Research PROGNOSIS IP Telephony Manager interoperability with Avaya Communication Manager. It consists of an Avaya Communication Manager system running on a pair of Avaya S8720 Media Servers with an Avaya G650 Media Gateway and a second system running on an Avaya S8300B Media Server with an Avaya G700 Media Gateway. Both systems have Avaya IP, Digital and analog telephones, and Avaya IP Softphone and IP Agent users configured for making and receiving calls. IP Trunks connects the two systems together to allow calls between them. Integrated Research PROGNOSIS IP Telephony Manager was installed on a server running Microsoft

Windows Server 2003 Standard with Service Pack 1. Both the Monitoring Node and GUI software are installed on this server. All the systems and telephones are connected using two Avaya C364T-PWR Converged Stackable Switches for network connectivity.

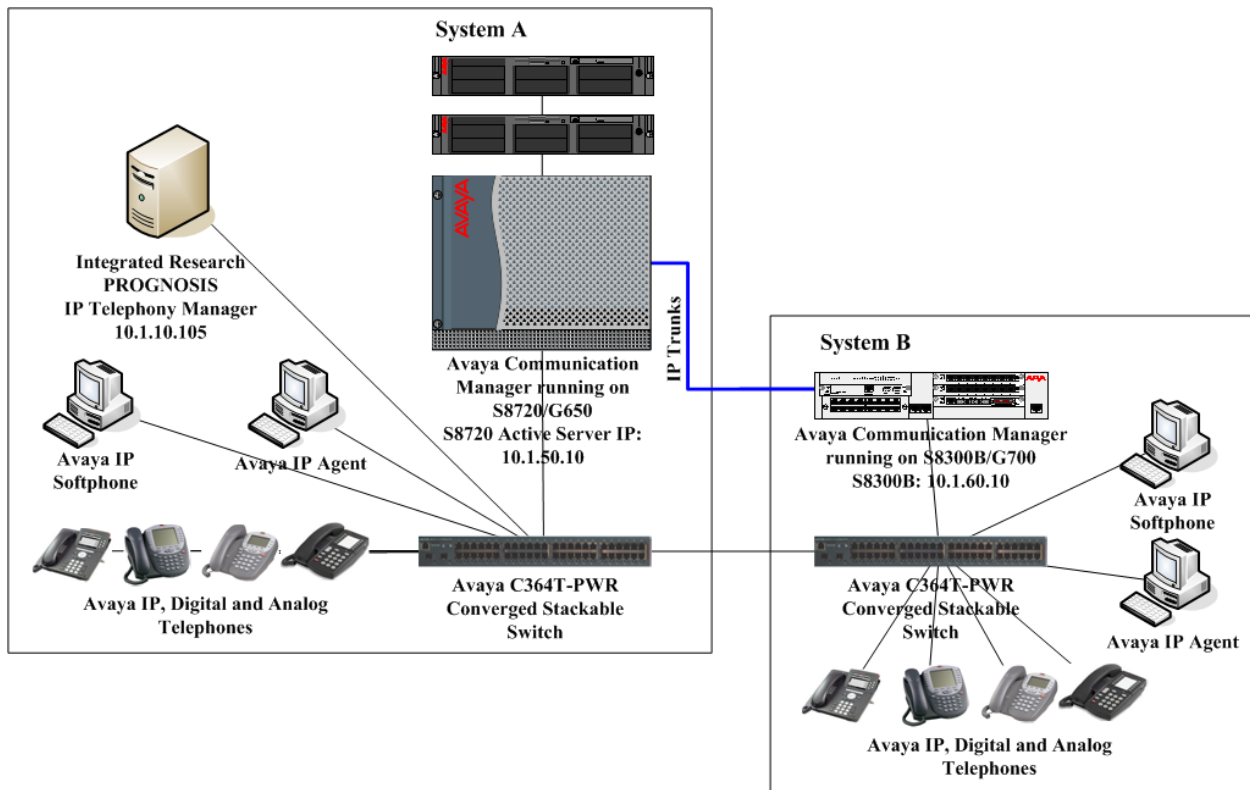


Figure 1: Sample Configuration

2. Equipment and Software Validated

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

Equipment	Software
Avaya S8720 Media Servers	3.1.2 (R013x.01.2.632.1)
Avaya G650 Media Gateway	-
<ul style="list-style-type: none"> • TN2312BP IP Server Interface • TN799DP C-LAN Interface • TN2302AP IP Media Processor 	HW15, FW036 HW01, FW017 HW20, FW115
Avaya S8300B Media Server	3.1.2 (R013x.01.2.632.1)
Avaya G700 Media Gateway	25.33.0
Avaya 4600 series IP telephones	R2.7
Avaya 9600 series IP telephones	R1.1
Avaya 6200 series analog telephones	-
Avaya 2400 series digital telephones	-
Avaya IP Softphone	R5.2 Service Pack 1
Avaya IP Agent	R6.0.14.526

Avaya C364T-PWR Converged Stackable Switches	4.5.14
Integrated Research PROGNOSIS IP Telephony Manager	9.0.0
Microsoft Windows Server 2003 Standard	Service Pack 1

3. Configure Avaya Communication Manager

This section describes the steps needed to configure Avaya Communication Manager to interoperate with Integrated Research PROGNOSIS IP Telephony Manager. This section describes the steps to create a login account for PROGNOSIS to access Avaya Communication Manager, the assigning of permissions to the login account and the steps to enable RTCP reporting.

3.1. Configure SAT Login Account

PROGNOSIS IP Telephony Manager logs into Avaya Communication Manager to monitor the configuration, usage and health of the system. As PROGNOSIS IP Telephony Manager does not modify any system configuration, creating a separate SAT login account with limited permissions is recommended.

Step	Description
1.	Enter the add login <i>login-id</i> command, where <i>login-id</i> is the name of login account to be created. Set Login Type to <i>customer</i> and Service Level to <i>non-super-user</i> .
	<pre> add login iptelmgr Page 1 of 1 LOGIN ADMINISTRATION LOGIN BEING ADMINISTERED Login's Name: iptelmgr Login Type: customer Service Level: non-super-user Days To Disable After Inactivity: Disable Following a Security Violation? y LOGIN'S PASSWORD INFORMATION Login's Password: Reenter Password: Change Password at First Login? n Password Aging Cycle Length (Days): LOGOFF NOTIFICATION Facility Test Call Notification? y Acknowledgement Required? y Remote Access Notification? y Acknowledgement Required? y </pre>

2.	Enter the change permissions <i>login-id</i> command, where <i>login-id</i> is the login account created in Step 1. Set Display Admin. and Maint. Data and System Measurements to y .
<pre> change permissions iptelmgr Page 1 of 1 COMMAND PERMISSION CATEGORIES Login Name: iptelmgr COMMON COMMANDS Display Admin. and Maint. Data? y System Measurements? y System Mgmt Data Transfer Only? n ADMINISTRATION COMMANDS Administer Stations? n Administer Features? n Administer Trunks? n Administer Permissions? n Additional Restrictions? n MAINTENANCE COMMANDS Maintain Stations? n Maintain Switch Circuit Packs? n Maintain Trunks? n Maintain Process Circuit Packs? n Maintain System? n Maintain Enhanced DS1? n </pre>	

3.2. Configure RTCP Monitoring

To allow PROGNOSIS IP Telephony Manager to monitor the quality of IP calls, configure Avaya Communication Manager to send RTCP reporting to the IP address of the PROGNOSIS server.

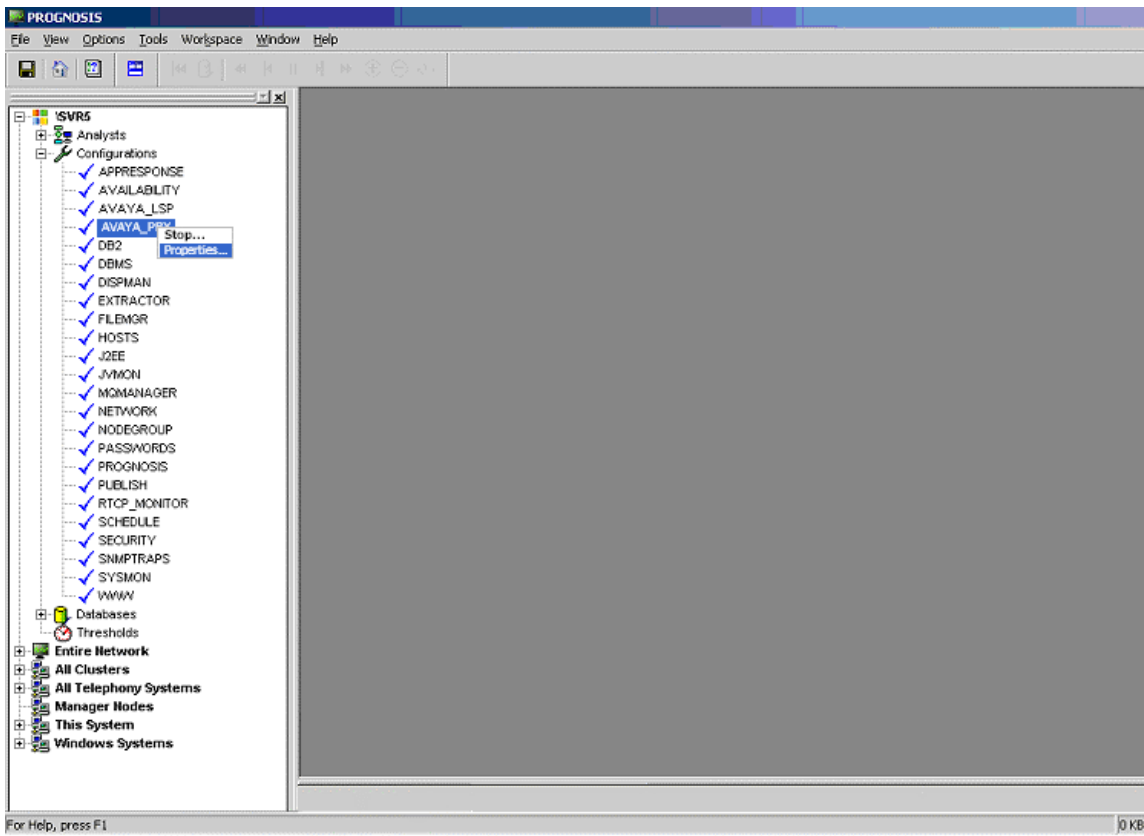
Step	Description
1.	Enter the change system-parameters ip-options command. In the RTCP MONITOR SERVER section, set Default Server IP Address to the IP address of the PROGNOSIS IP Telephony Manager server. Set Default Server Port to 5005 and Default RTCP Report Period(secs) to 5 .
<pre> change system-parameters ip-options Page 1 of 2 IP-OPTIONS SYSTEM PARAMETERS IP MEDIA PACKET PERFORMANCE THRESHOLDS Roundtrip Propagation Delay (ms) High: 800 Low: 400 Packet Loss (%) High: 40 Low: 15 Ping Test Interval (sec): 20 Number of Pings Per Measurement Interval: 10 RTCP MONITOR SERVER Default Server IP Address: 10 .1 .10 .105 Default Server Port: 5005 Default RTCP Report Period(secs): 5 AUTOMATIC TRACE ROUTE ON Link Failure? y H.248 MEDIA GATEWAY H.323 IP ENDPOINT Link Loss Delay Timer (min): 5 Link Loss Delay Timer (min): 5 Primary Search Time (sec): 75 Periodic Registration Timer (min): 20 </pre>	

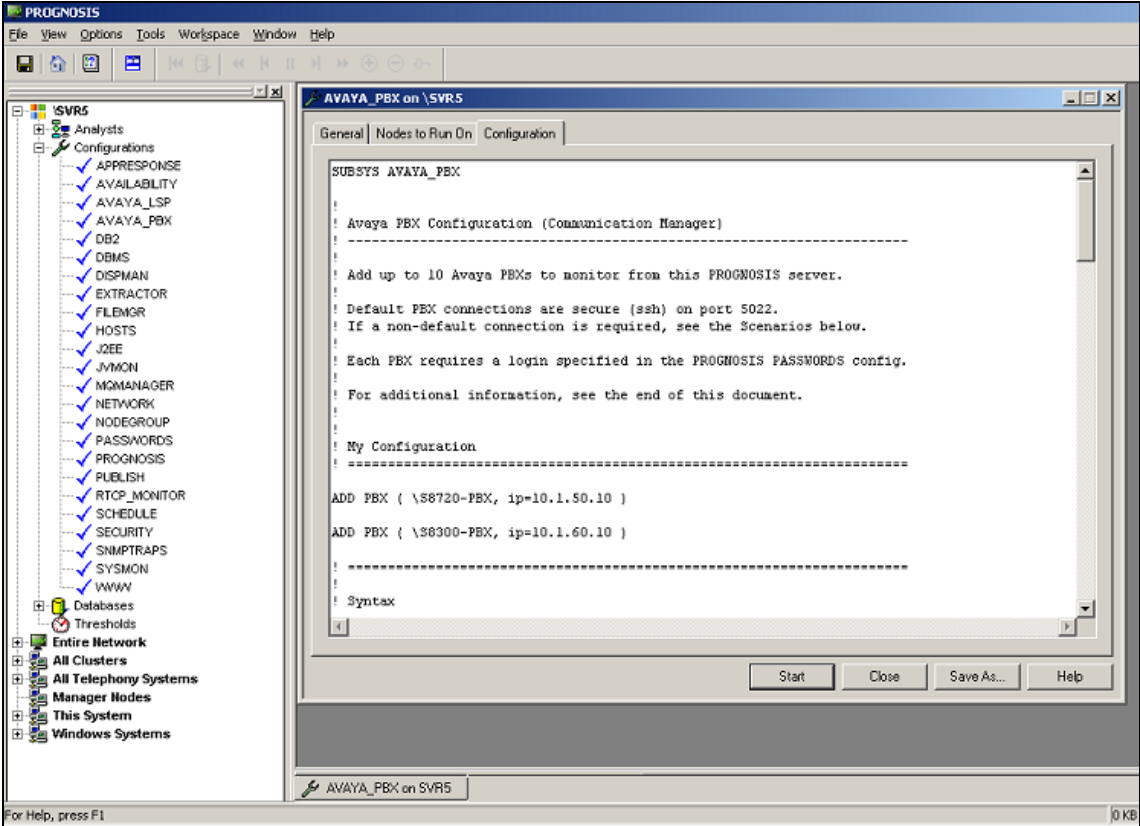
Step	Description
2.	<p data-bbox="277 260 1406 365">Enter the change ip-network-region <i>n</i> command, where <i>n</i> is IP network region number to be monitored. Set RTCP Reporting Enabled to <i>y</i> and Use Default Server Parameters to <i>y</i>.</p> <p data-bbox="277 407 1382 438">Note: Only one RTCP MONITOR SERVER can be configured per IP network region.</p> <pre data-bbox="277 480 1414 1073"> change ip-network-region 1 Page 1 of 19 IP NETWORK REGION Region: 1 Location: 1 Authoritative Domain: sglab.com Name: SP Main MEDIA PARAMETERS Codec Set: 1 Intra-region IP-IP Direct Audio: yes UDP Port Min: 2048 Inter-region IP-IP Direct Audio: yes UDP Port Max: 65535 IP Audio Hairpinning? y DIFFSERV/TOS PARAMETERS Call Control PHB Value: 46 RTCP Reporting Enabled? y Audio PHB Value: 46 RTCP MONITOR SERVER PARAMETERS Video PHB Value: 26 Use Default Server Parameters? y 802.1P/Q PARAMETERS Call Control 802.1p Priority: 6 Audio 802.1p Priority: 6 Video 802.1p Priority: 5 AUDIO RESOURCE RESERVATION PARAMETERS H.323 IP ENDPOINTS RSVP Enabled? n H.323 Link Bounce Recovery? y Idle Traffic Interval (sec): 20 Keep-Alive Interval (sec): 5 Keep-Alive Count: 5 </pre>
3.	Repeat Step 2 for all IP network regions that are required to be monitored.

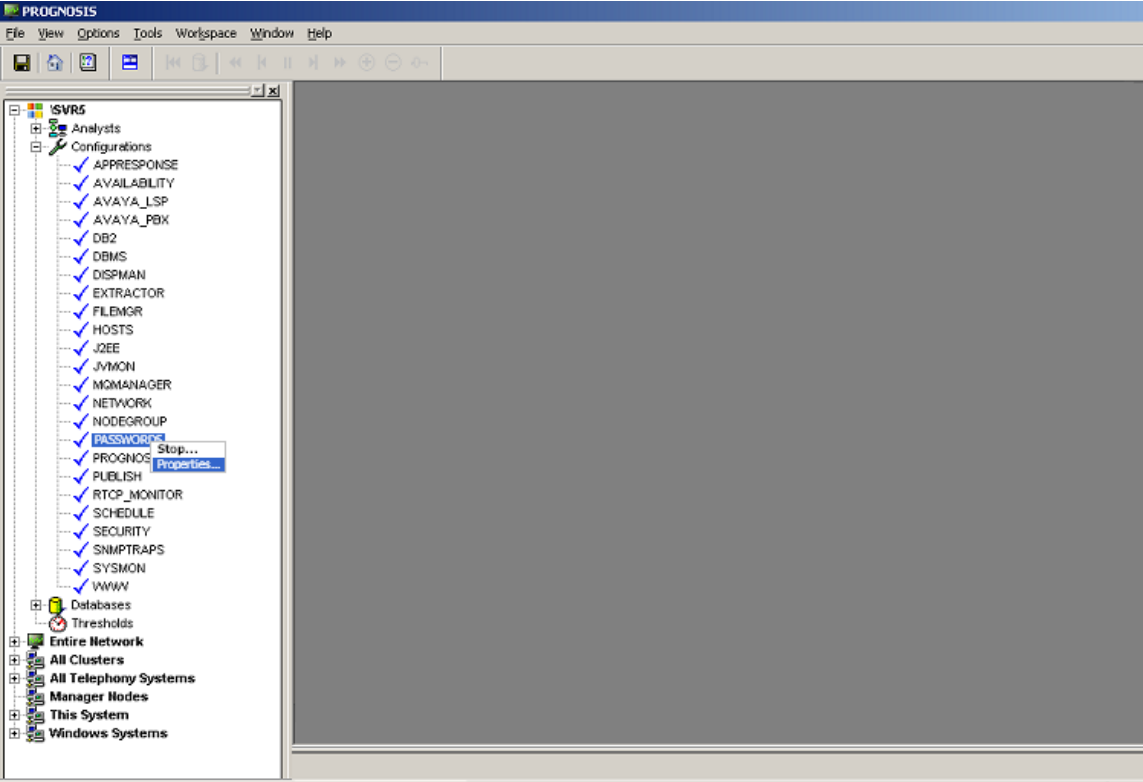
4. Configure Integrated Research PROGNOSIS IP Telephony Manager

This section describes the configuration of Integrated Research PROGNOSIS IP Telephony Manager required to interoperate with Avaya Communication Manager.

Step	Description
1.	On the Integrated Research PROGNOSIS IP Telephony Manager server, click Start → All Programs → PROGNOSIS IP Telephony Manager → PROGNOSIS GUI to start the PROGNOSIS GUI application. Enter a valid Windows user account and password to log in to the Monitoring Node.
2.	To configure Avaya Communication Manager systems to be monitored, expand Configurations of the Monitoring Node, right-click on AVAYA_PBX and select Properties .



Step	Description
3.	<p>In the Configurations tab, add an entry for each Avaya Communication Manager system to be managed. The template to add a system is given in the PROGNOSIS GUI application. In this sample configuration, the following entries are added for the two Avaya Communication Manager systems with the names <i>S8720-PBX</i> and <i>S8300-PBX</i> and with the IP addresses of the Media Servers 10.1.50.10 and 10.1.60.10 respectively. The PROGNOSIS Monitoring Node will use SSH to connect to port 5022 of the Media Servers by default.</p> <p style="text-align: center;">ADD PBX (\S8720-PBX, ip=10.1.50.10)</p> <p style="text-align: center;">ADD PBX (\S8300-PBX, ip=10.1.60.10)</p> <p>Click Start to proceed.</p> 

Step	Description
4.	<p>To configure the SAT login account and password, expand Configurations of the Monitoring Node, right-click on PASSWORDS and select Properties.</p>  <p>The screenshot shows the PROGNOSIS application window. The left-hand tree view is expanded to 'Configurations' under the 'SVRS' node. The 'PASSWORDS' item is selected, and a context menu is displayed over it with the 'Properties...' option highlighted. Other items in the tree include APPRESPONSE, AVAILABILITY, AVAYA_LSP, AVAYA_PBX, DB2, DBMS, DISPMAN, EXTRACTOR, FILEMGR, HOSTS, J2EE, JVMON, MCMANAGER, NETWORK, NODEGROUP, PROGNOSIS, PUBLISH, RTCP_MONITOR, SCHEDULE, SECURITY, SNMPTRAPS, SYSMON, and WWW. Below the tree are sections for Databases, Thresholds, Entire Network, All Clusters, All Telephony Systems, Manager Nodes, This System, and Windows Systems. The status bar at the bottom left says 'For Help, press F1' and the bottom right shows '0 KB'.</p>

Step	Description
5.	Click the + 'plus' button to add a new password entry for each of the configured system in Step 3. The Entry Name must be of the form <i>avaya-sat:<pbx-name></i> . For the system with the name <i>S8720-PBX</i> , enter <i>avaya-sat:S8720-PBX</i> for Entry Name , uncheck Password Only , and enter the login account created in Section 3.1 for Username and Password . Repeat to add another entry for the second system <i>S8300-PBX</i> . Click Start to proceed.

5. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing.

The feature testing evaluated the ability of the PROGNOSIS IP Telephony Manager to correctly retrieve the configuration, performance, alarms and errors from an Avaya Communication Manager system. In addition, the ability of PROGNOSIS IP Telephony Manager to receive and process RTCP information from Avaya Communication Manager and Avaya IP endpoints was also validated.

The serviceability testing introduced failure scenarios to see if PROGNOSIS IP Telephony Manager is able to resume service after failure recovery and media server interchange.

5.1. General Test Approach

The general test approach was to use PROGNOSIS GUI to display the configurations of Avaya Communication Manager systems and verify against what is displayed on the SAT interface. The SAT interface is accessed by using either telnet or Secure Shell (SSH) to the Avaya Media Server. Calls were placed between various Avaya endpoints and the PROGNOSIS GUI was used to display the RTCP information collected.

For feature testing, PRONOSIS GUI was used to view the configurations of Avaya Communication Manager such as media gateways, cabinets, port networks, trunk groups, route patterns, CLAN, MEDPRO and DS1 boards, IP network regions, stations, processor occupancy, alarm and error information. Various conditions such as media gateway, port network, trunk group, trunk member and endpoint failures were created to see if PROGNOSIS IP Telephony Manager was able to detect the outage. For the collection of RTCP information, the endpoints included Avaya IP, digital and analog telephones, and Avaya IP Softphone and IP Agent users.

For serviceability testing, reboots were applied to the PROGNOSIS IP Telephony Manager server and Avaya Communication Manager Media Servers to simulate system unavailability. Interchange of the Avaya S8720 Media Servers were also performed during testing.

5.2. Test Results

All test cases passed successfully. Integrated Research PROGNOSIS IP Telephony Manager successfully interoperates with Avaya Communication Manager.

6. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager and Integrated Research PROGNOSIS IP Telephony Manager.

6.1. Verify Avaya Communication Manager

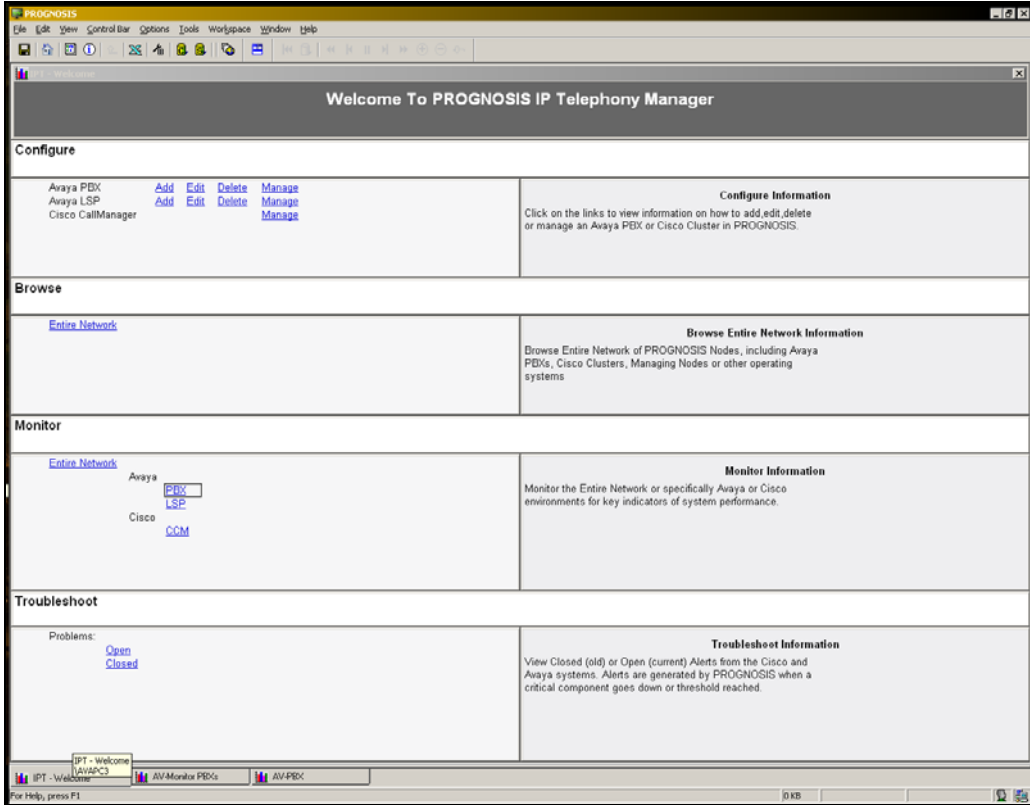
Verify that PROGNOSIS IP Telephony Manager has established three concurrent SSH connections to the SAT by using the **status logins** command.

```
status logins
```

USER LOGIN INFORMATION					
Login	Type	Location	Aux	Active Command	ID
*dadmin	SYS-PORT	SSH	135.27.8.190	stat logins	1
iptelmg	SYS-PORT	SSH	10.1.10.105		3
iptelmg	SYS-PORT	SSH	10.1.10.105		4
iptelmg	SYS-PORT	SSH	10.1.10.105		5

6.2. Verify Integrated Research PROGNOSIS IP Telephony Manager

The following steps are done using the PROGNOSIS GUI.

Step	Description
1.	<p>After logging into PROGNOSIS GUI, click on the Home button on the toolbar to display the Welcome screen. In the Monitor section, click Entire Network→Avaya→PBX to display the list of Avaya Communication Manager Media Servers configured in Section 4 Step 3.</p> 

Step	Description
2.	In the Avaya System page, verify that the SAT field for each configured Avaya Communication Manager shows 3 connections.

The screenshot displays the PROGNOSIS Avaya System interface. At the top, there is a menu bar with options: File, Edit, View, Control Bar, Options, Tools, Workspace, Window, Help. Below the menu bar is a toolbar with various icons. The main window title is "Avaya System".

Under the "Entire Network" section, there are navigation tabs: "by PBX" (selected), "by LSP", "by Customer", "by Site", and "Calls".

A table lists the PBX configurations:

▲	PBX	Customer	Site	SAT	Major	Minor	CPU	Phones	Trunk Grps	Change
	IS8720-PBX			3	0	0		5 9 of 20	3 of 5	Config
	IS8300B-PBX			3	0	0		5 3 of 10	3 of 5	Config

Below the table is a section titled "Active IP Call Legs". It contains a line graph showing the number of active IP call legs over time. The Y-axis represents the number of call legs, ranging from 0 to 10. The X-axis shows time intervals: 10:26:10, 10:27:10, 10:28:10, 10:29:10, and 10:30:10. The graph shows a fluctuating purple area representing the number of active call legs, which generally stays between 6 and 9. A legend on the right indicates that the purple area represents "IS8720-PBX (9)" and "Unknown (0)".

At the bottom of the interface, there is a status bar showing "AVAPCS | AVCLQSL(s): 10 | Fri Jan 12th 2007 10:31:00". Below the status bar are several tabs: "IPT - Welcome", "AV-Monitor PBXs", and "AV-PBX". The "AV-PBX" tab is currently active. The bottom right corner shows "0 KB" and a help icon.

7. Support

For technical support on Integrated Research PROGNOSIS IP Telephony Manager, contact the Integrated Research Support Team at:

- Phone: +61 (2) 9966 1066
- Fax: +61 (2) 9921-1042
- Email: support@prognosis.com

8. Conclusion

These Application Notes describe the procedures for configuring the Integrated Research PROGNOSIS IP Telephony Manager 9.0.0 to interoperate with Avaya Communication Manager Release 3.1.2. In the configuration described in these Application Notes, the PROGNOSIS IP Telephony Manager established SSH connections to the SAT to view the configurations of Avaya Communication Manager and to monitor for failures. PROGNOSIS IP Telephony Manager also processed the RTCP information to monitor the quality of IP calls. During compliance testing, all test cases were completed successfully.

9. Additional References

The following document can be found at <http://support.avaya.com>:

- Administrator Guide for Avaya Communication Manager, 03-300509, Issue 2, February 2006

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