ADSP Access Point Test

How-To Guide

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Document Conventions

The following graphical alerts are used in this document to indicate notable situations:

NOTE This symbol indicates something of special interest or importance to the reader. Failure to read the note will not result in physical harm to the reader, equipment or data.

CAUTION This symbol indicates that if this information is ignored, the possibility of data or material damage may occur.

WARNING! This symbol indicates that if this information is ignored the possibility that serious personal injury may occur.

1 Introduction

Access Point (AP) Test is part of the advanced troubleshooting module of the AirDefense Services Platform (ADSP.) AP Test is a tool that helps you (as an IT administrator) to track network failures using an automated or manual AP connectivity test. You can create test profiles to verify the availability of different network components and application servers right from Layer-2 to Layer-4.

AP Test generates alarms to indicate a failure of one or more of the test conditions in the test profile. These alarms indicate high priority events that may be preventing the wireless applications from operating properly. An Action can be set up for each alarm; for example, to send an e-mail notification to appropriate the network administrator so that corrective action can be taken.

2 System Diagram

The following figure depicts system components involved in an AP Test. In order to use AP Test functionality, the deployment should have an AirDefense appliance with one or more Sensors, or radio share enabled Access Points.

Sensors or radio share enabled AP collect frames transmitted by 802.11a-b-g-n compliant devices, and sends that data to a central ADSP server for analysis and correlation.

ADSP provides the most advanced wireless LAN troubleshooting with a distributed architecture of remote Sensors or radio share enabled AP that communicate with a centralized server.

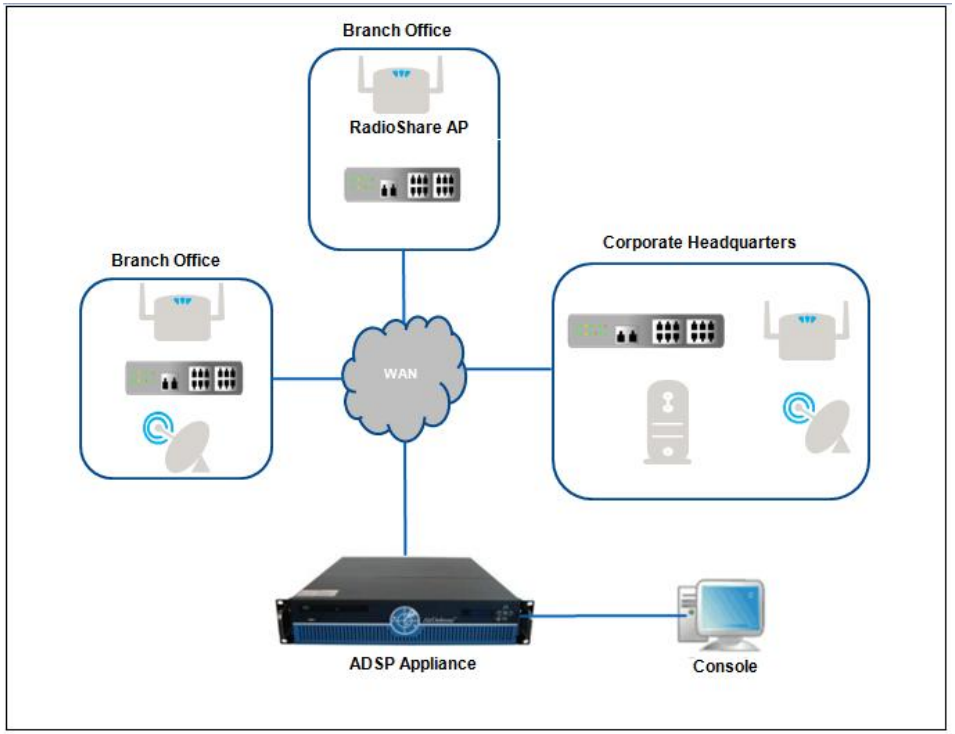

Figure 1: ADSP System Architecture

The AP Test is accomplished by using a deployed Sensor as a wireless station to connect to an AP and validating appropriate network resources (layer-2 to layer-4) that can be reached.

AP Testing allows validation of wireless authentication, encryption, DHCP, ACL and firewall testing, general network connectivity, and application availability testing. These connectivity tests can be run automatically or manually providing proactive notification that the network resources may be unavailable.

3 Licensing AP Test

AP Test is part of the Advanced Troubleshooting Module and requires a license for unlocking this functionality in the ADSP appliance.

AP Test requires a license for each device, where the device can be a Sensor or a radio share enabled AP. Note that, the Sensor can be a dedicated Sensor device or a dual-radio AP where one radio is configured for a Sensor and other for WLAN mode.

Radio Share AP Test license can be used in environments where there are no dedicated Sensors. Customers with the existing WLAN infrastructure can benefit from radio share license to gain access to Advanced Troubleshooting tools and maximize the return on their WLAN investment.

The following table provides different licensing options for the AP Test module.

Part Number	Description
AD-APSN-P-1	AirDefense AP Test license for one (1) Sensor. ***NOTE*** Must add a first-year maintenance/service program to this product SKU.
AD-APRS-P-1	AirDefense Radio Share AP Test license for one (1) AP. ***NOTE*** Must add a first-year maintenance/service program to this product SKU.
ADB-NARS-P-1	AirDefense Radio Share license, Network Assurance bundle for one (1) AP. Includes: AP Test, Adv. Forensics, Connectivity Troubleshooting, LiveRF and Spectrum Analysis. ***NOTE*** Must add a first-year maintenance/service program to this product SKU.

Table 1: License Options for AP Test

The license can be applied on an ADSP appliance. In ADSP version 9.x, you can apply the above licenses from **Configuration** > **Appliance Platform** > **Appliance Licensing** in the ADSP User Interface.

Note that, if you run an AP Test on a BSS, where there is no licensed Sensor or Radio Share enabled AP available, you will see the following error.

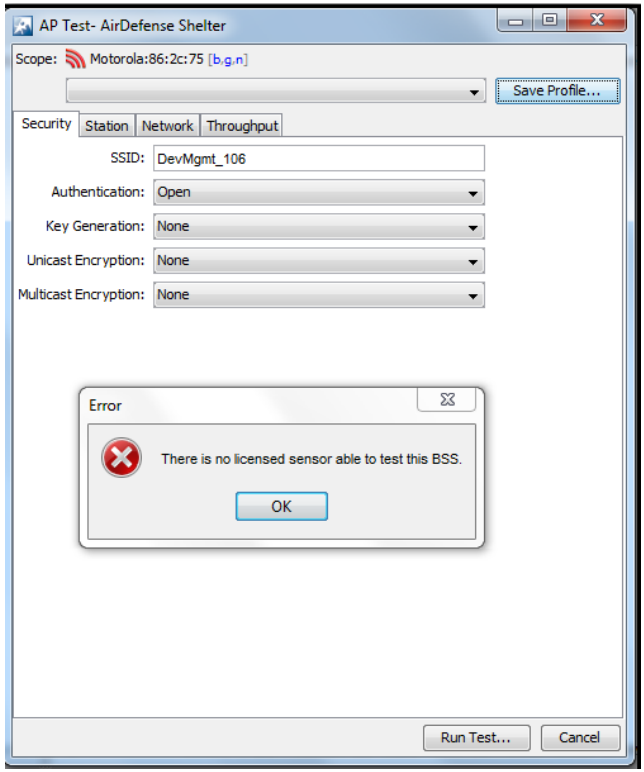

Figure 2: No AP Test License Error

Please refer to Section 6 for details on the supported firmware versions for different Access Point and Sensor models for using AP Test.

4 Configuring AP Test

AP Test can be run in two ways:

- The **Scheduled AP Test** is an automatic test that can be scheduled to run at any specific time in a day or a week. This provides proactive notification to the IT staff about any issues regarding the availability of wireless and wired network resources and application servers.

- The **On-Demand AP Test** is a manual test.

4.1 Scheduled AP Tests

To access the **Scheduled AP Test** window, you must select **Menu** > **Scheduled AP Test**, as shown below.

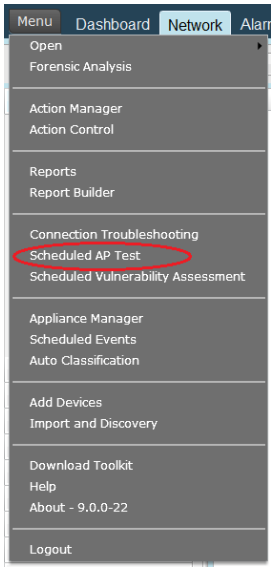

Figure 3: Launching Scheduled AP Test

The following window is displayed where you can schedule an AP Test. Please refer to next section for details on creating APT profiles.

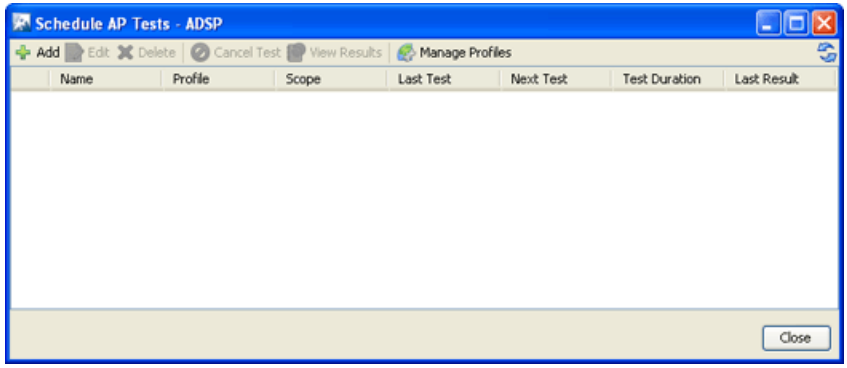

Figure 4: Schedule AP Tests

4.2 Managing APT Profiles

Profiles make it easy to apply the same settings to different AP Tests. You can create different APT profiles to test networks with different SSIDs and authentication/encryption settings, or different resources on the network. These profiles can be modified or deleted if the network configuration or setup changes.

4.2.1 Creating APT Profiles

To create an APT profile, press the **Manage Profiles** button in the **Schedule AP Tests** window, as shown below.

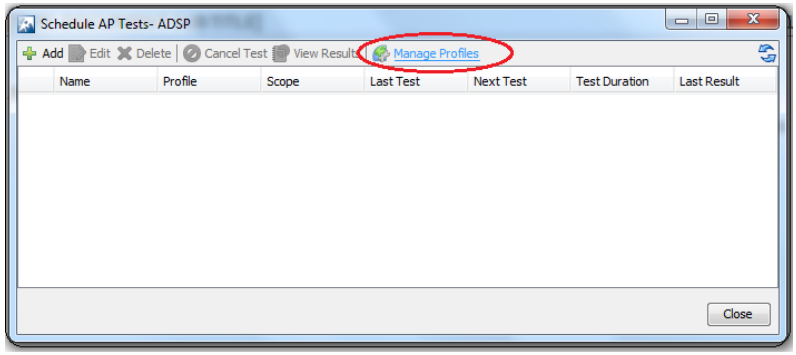

Figure 5: Manage AP Test Profiles Window

The following window displays. From here you can create and delete the profiles for AP Test.

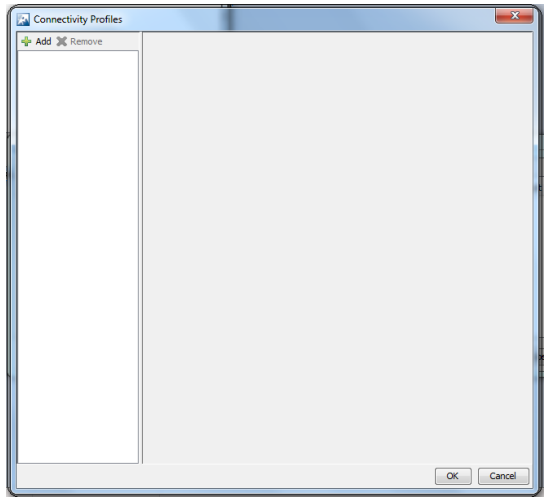

Figure 6: Adding and Removing APT Profiles

Press the **Add** button to create an APT profile. This brings up the **Connectivity Profiles** window as shown below.

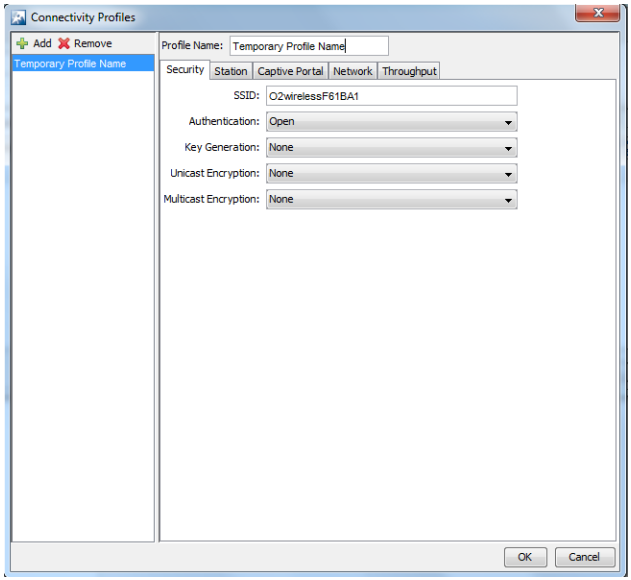

Figure 7: Connectivity Profile Window

Enter a profile name and configure the following sections in the APT profile.

- Security— configures the SSID and authentication settings
- Station—configures MAC address, and IP/DHCP settings used for STA to connect to AP
- Captive Portal—configures input parameters for validation of captive portal service
- Network—configures Layer-3 tests
- Throughput—configures downlink throughput test.

Security Tab

The **Security** tab provides fields for configuration of security parameters like authentication, key generation, encryption, and passphrase for the BSS to be tested. The following table describes the various fields, which are dependent on the type of BSS being tested.

SSID	Service Set Identifier (SSID) of the Access Point.
Authentication	Type of authentication used to authenticate users on a local or remote (LDAP or RADIUS) server. Choices are **Open**, **Shared Key**, or **NetworkEAP**.

Key Generation	Method used to generate the keys that are necessary to encrypt data. Choices are **None**, **802.1x**, **PSK**, or **EAP**.
Unicast Encryption	Encryption method used during unicast transmissions.
Multicast Encryption	Encryption method used during multicast transmissions.
WPA Protocol	(Wi-Fi Protected Access (WPA) method used to secure the connection to the wireless network. Choices are WPA or WPA2.
PSK Key	Pre-shared key (shared secret) used to authenticate user access to the AP.
Key Size	Key size used for a WEP key. Choices are 64 bits 10 hex digits or 128 bits 26 hex digits.
WEP Key	Wireless Equivalent Privacy (WEP) key used to authenticate user access to the AP.
Key Index	Index number used to identify a WEP key.
EAP Method	Extensible Authentication Protocol (EAP) method used in LAN authentication. Choices are **LEAP**, **EAP/Fast Auto**, **EAP/Fast Manual**, **EAP-TLS**, **PEAP-MSCHAPv2**, **PEAP-GTC**, or **PEAP-TLS**. All methods except **LEAP** and **EAP/FAST Auto**, when selected, allow you to use certificates.
EAP Username	EAP username used in LAN authentication.
EAP Password	EAP password used in LAN authentication.

Station Tab

AP Test uses a Sensor as a virtual STA for its AP connectivity test. The **Station** tab allows you to configure the virtual station used during the AP test.

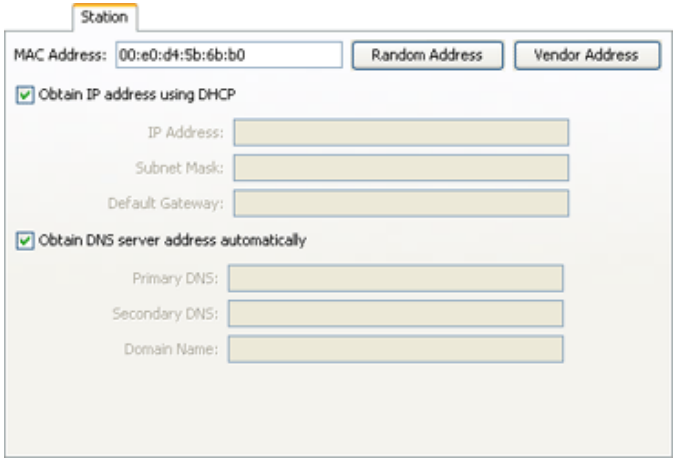

Figure 8: APT - Station Tab Configuration

The following fields are part of this tab.

MAC Address	Since AP Test uses a virtual station for its test, an artificial MAC address must be specified for the test station. The MAC address field is initialized to the most recently used test station MAC address. If no previous address is found, a random MAC address is used. You may change the MAC address by typing one in the field or click the Random Access button to generate one. You may also generate a MAC address by clicking the Vendor Address button and selecting a vendor from a list of vendors.
Obtain IP address using DHCP	You can obtain an IP address using DHCP or specify a static IP address. If you want to specify a static IP address, you must also specify the subnet mask and default gateway. The default is to obtain IP address using DHCP. Uncheck the checkbox to activate the fields and to specify a static IP address, subnet mask, and default gateway.
Obtain DNS server address automatically	You can obtain DNS server information automatically or specify the information yourself. The default is to obtain the information automatically. If you want to specify the information, uncheck the checkbox to activate the fields and then specify the primary DNS, secondary DNS, and domain name.

Captive Portal Tab

The **Captive Portal** tab allows you to configure AP Test for testing captive portal service running on the infrastructure device and validate whether the service is running correctly or not.

✓ ***NOTE*** The upload throughput test is available from ADSP 9.0.3 release.

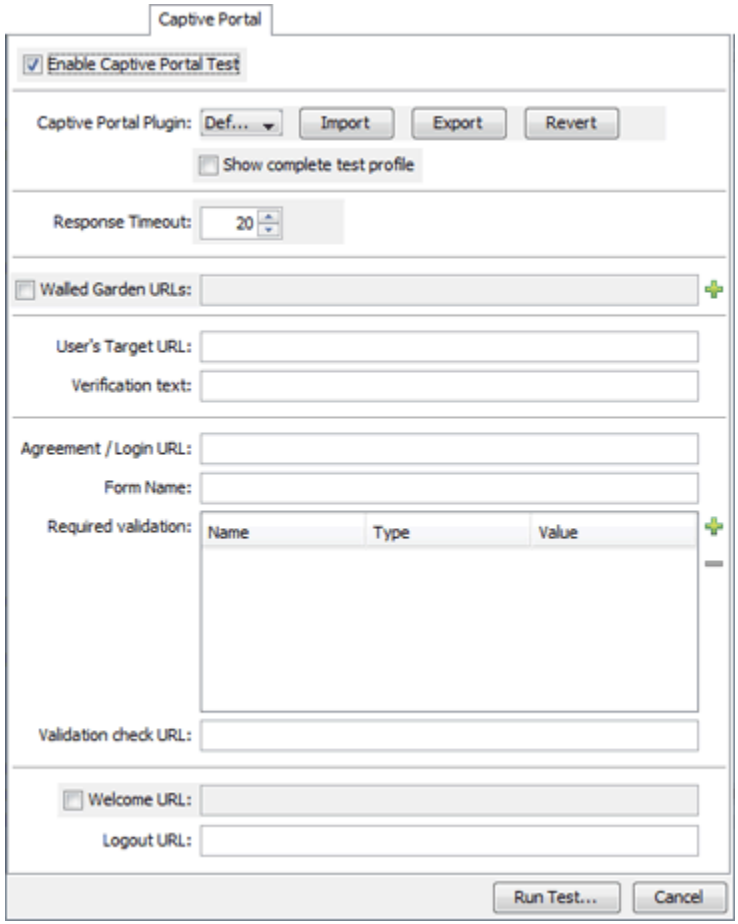

Figure 9: APT – Captive Portal Configuration

The following fields are part of this tab:

Enable Captive Portal Test	Enable/disable captive portal testing in AP Test.

Captive Portal Plug-in	Specifies captive portal plug-in containing information about the captive portal. The dropdown menu contains a list of plug-ins. You can import plug-ins with the **Import** button. You can export plug-ins with the **Export** button. The **Revert** button resets all fields to their previous stats. Some fields may be hidden because the information is contained in the plug-in. Selecting **Show complete test profile** reveals the hidden fields.
Response Timeout	Sets the response timeout for the initial redirected login page or post login page. The default response timeout is 20 seconds.
Walled Garden URLs	If the captive portal being tested supports the Walled Garden feature with a list of white list URLs, AP Test will verify that the system allows access to the white list. AP Test can verify a maximum of 5 URLs. This field is optional.
User's Target URL	Specifies an IP address or URL that will be checked by AP Test to ensure that it can't be accessed before captive portal log-in. The same URL will also be checked by AP Test to see whether captive portal grants access to it, after successful log-in.
Verification text	Specifies some text that appears on the target website as specified in User's Target URL.
Agreement / Login URL	Specifies the agreement web page or the login web page where a user has to accept the use policy or authenticate with a username and password.
Form Name	The form name used to submit acceptance of the use policy or authentication credentials.
Required validation	Provides a list of names that require validation. The name must be specified by type (dynamic or static) and value.
Validation check URL	Specifies the web page used to validate names in the **Required validation** field.

Welcome URL	Specifies a welcome page the user accesses once he/she has accepted the use policy or authenticated with a username and password. This field is optional.
Logout URL	Specifies a logout page after the user has terminated from the target URL.

Network Tab

The **Network** tab allows you to configure tests related to Layer-3 and above. You can include appropriate tests by enabling or disabling corresponding check boxes.

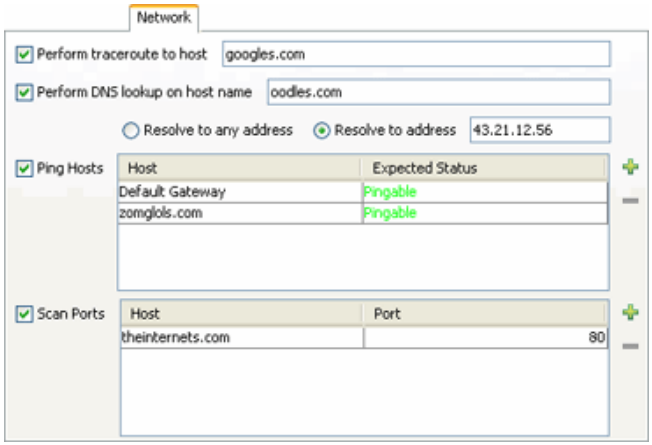

Figure 10: APT - Network Tab Configuration

The following fields are part of this tab.

Perform trace route to host	Used to determine the route taken by packets across the network to the specified host.
Perform DNS lookup on host name	Used to determine DNS information of the AP on the specified host. You can resolve to any address or to a specific address.
Ping Hosts	Used to test the ability of the AP to communicate with the specified host by pinging the host.

Scan Ports	Used to conduct a port scan on the specified host.

Throughput Tab

The **Throughput** tab allows you to specify FTP server details to download or upload a test file during an AP Test and provide the acceptable downlink or uplink bandwidth speed. You can enable or disable throughput test by selecting or deselecting **Enable Download Test** or **Enable Upload Test** checkbox in the **Throughput** tab.

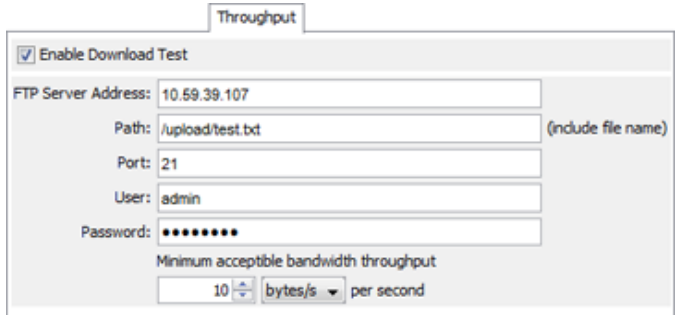

Figure 11: APT - Throughput Tab Configuration

The following fields are part of this tab.

FTP Server	Address IP address of your ftp server that you want to test.
Path	Full path of the file that you want to use in your test.
Port	Port number to your FTP server. (Usually 21 for FTP servers.)
User	User name used to log into the FTP server.
Password	Password of the user specified in the **User** field.
Minimum acceptable bandwidth throughput	Minimum bandwidth throughput that is acceptable to download (or upload) the test file. If bandwidth throughput is less than the specified value, an error occurs and is displayed in the Results.

Once you configure all the sections, Press **OK** in the **Connectivity Profiles** window to save the profile that was created.

✓ ***NOTE*** The upload throughput test is available from ADSP 9.0.2 release.

4.2.2 Deleting APT Profiles

To delete an APT profile, select the profile and press the **Remove** button in the **Connectivity Profiles** windows, as shown below.

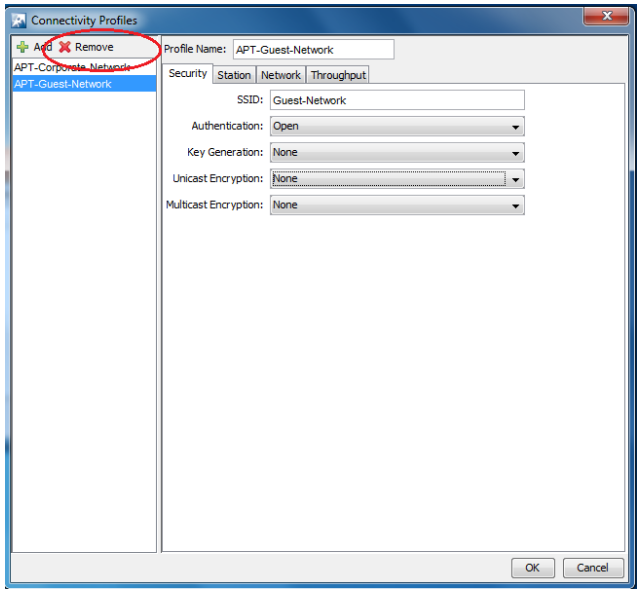

Figure 12: Deleting APT Profiles

4.2.3 Scheduling AP Tests

To schedule an AP Test, press the **Add** button in the **Schedule AP Tests** window as shown below.

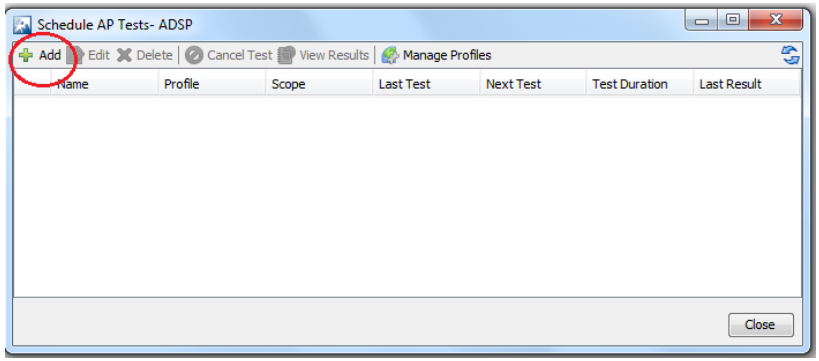

Figure 13: Scheduling an AP Test

You will see the following **Add Scheduled AP Test** window, where you can select the APT profile, configure various parameters related to the scheduled AP Test, and enable the test.

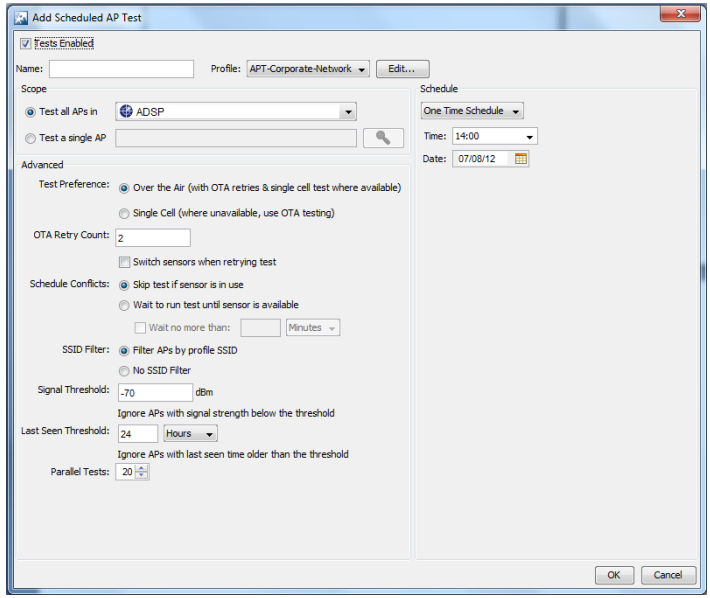

Figure 14: Adding Scheduled AP Test

The following fields are part of this window. Once you set all the options, click **OK** to schedule the AP Test.

Name	Name of this scheduled AP Test.

Profile	Choose the profile from the list of APT profiles created earlier.
Edit	Click this button to edit any APT profile.
Scope	The **Scope** section is where you can limit the scope of your AP Test. You can test all of the APs in a specific network level. You can also search and select one AP as your scope.
Schedule	There are five options to schedule a test: **One Time**, **Intra-Day**, **Daily**, **Weekly**, or **Monthly Schedule**. Once you have selected an option, you must select a time and date for the test.
Advanced	The **Advanced** section is where you can select specific criteria for the test. Over the Air—Select to perform over the air AP Test. Typically used for testing APs using Sensors. Single Cell—Select this button to carry out the AP Test on a BSS whose radio is collocated in same physical AP as that of Sensor, or for radio share enabled AP/BSS. Retry Count—Specify the number of times the test should be repeated if not completed. You can elect to switch Sensors on each retry. Schedule Conflicts—Select to skip a test if the Sensor or profile is already in use or select to wait until the Sensor or profile is available. If you select to wait, you can specify how long to wait in minutes or hours. SSID Filter—Select whether or not to filter APs using the SSID specified in the profile. Signal Threshold—Select a signal strength that the AP must have in order to conduct the test. Any AP below the threshold is ignored and will not be tested. Last Seen Threshold—Specify a threshold in minutes, days, or hours that an AP was last seen on the network. Any AP that has a last seen time older than the one specified will be ignored and will not be tested. Parallel Test – Specify how many AP Test can be run in parallel while testing APs in a given scope.

4.3 On-Demand AP Tests

You can run an AP Test at anytime by using an on-demand test. The test can be initiated on any selected BSS or at network level.

4.3.1 Initiating AP Tests

To initiate the test on a specific BSS, go to **Network** tab and select **BSS** in the **Show** list box for any desired scope in the network hierarchy. This lists all BSSs in that scope. Select the BSS to be tested, Right click on it, and choose **AP Test** option as shown below to launch the AP Test.

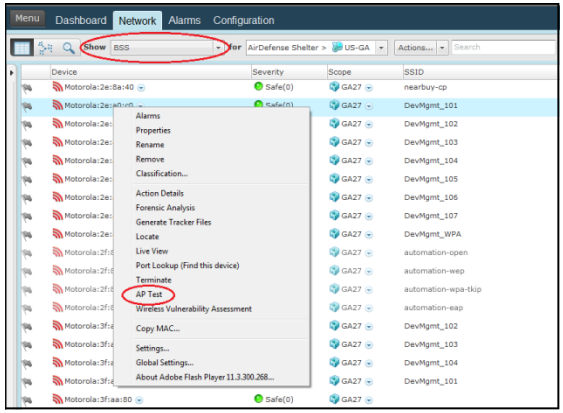

Figure 15: Launching On-demand AP Test

You will see the following **AP Test** screen.

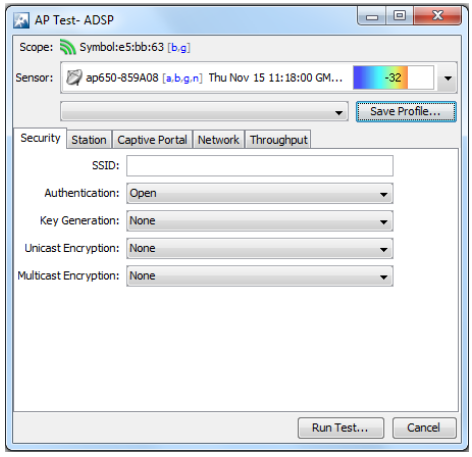

Figure 16: On-Demand AP Test Window

The **Scope** field indicates the scope in which the BSS being tested is present.

The **Sensor** field indicates the Sensor to be used during the AP Test. The system lists all available Sensors to test the chosen BSS and automatically selects the Sensor with the strongest signal for testing this AP/BSS.

The **Profile** list box displays the name of the AP Test profile, if any, used for the AP Test.

The **Save Profile** button saves the current settings to a profile that you name.

The APT configuration involves consists of the following tabs:

- Security—configures the SSID and authentication settings.
- Station—configures MAC address, and IP/DHCP settings used for STA to connect to AP.
- Captive Portal—configures input parameters for validation of captive portal service.
- Network—configures Layer-3 tests.
- Throughput—configures the download link throughput test.

In most cases, you will not have to change any of the fields in the **Security** tab, as Sensor populates them automatically, except the user name, password, PSK key etc.

Please refer to Section 4.2.1 for more details on configuration of all these tabs.

The **Run Test** runs the AP Test with the chosen test configuration.

The **Cancel** button closes AP Test without the test.

4.3.2 Analyzing Test Results

After initiating the AP Test, the results of the test will be displayed in the **Results** window. You can see the real-time status information as the test progresses.

- **Access Point** field indicates the Access Point that was tested.
- **Sensor** field indicates the Sensor that was used for testing the Access Point.
- **Station** field indicates the virtual station used during the AP Test.

The **Summary** tab displays a list of what was tested. Each of the tested items is marked as a success (green mark) or failure (red flag). You can press on the failed test items to get more information on the status of the failure.

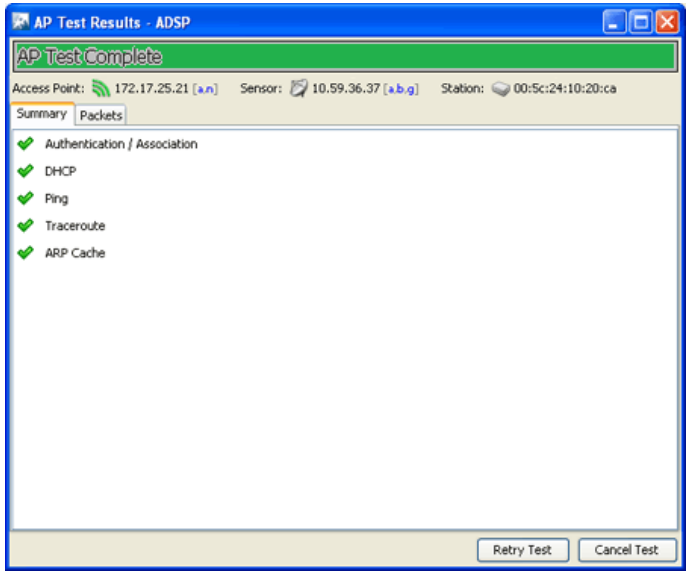

Figure 17: AP Test Results Window

The **Packets** tab displays frames captured during the AP Test, which is quite useful for debugging any failures during the AP Test. There are two views in this window: table and connection ladder. By default, you will see the table view as shown below.

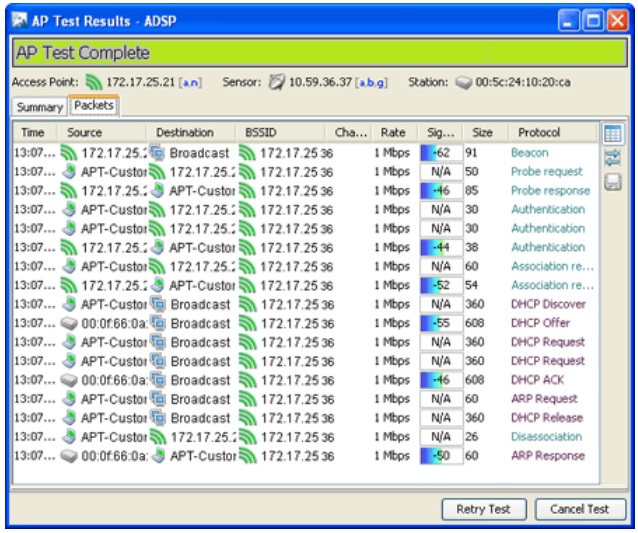

Figure 18: Packet Capture during AP Test

4.3.3 Saving APT Configuration

You can save the current AP Test configuration into a profile for later use. Once you configure APT, press the **Save Button** on the main APT window to save the current configuration.

You will see the following window prompting you to name the profile. These saved profiles can be used for testing different networks, or for automatic testing using Scheduled AP Test or Action Manager.

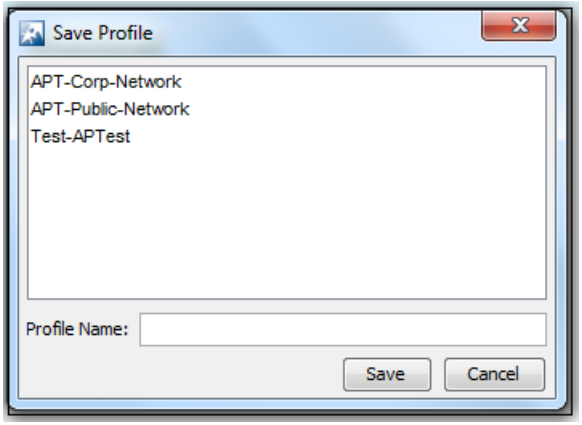

Figure 19: Saving APT Profile

4.4 Configuring AP Test in Action Manager

The Action Manager can be configured to run AP Test automatically based on any events (for example, performance alarms) generated by ADSP. You can invoke Action Manager from Menu > Action Manager from the main GUI.

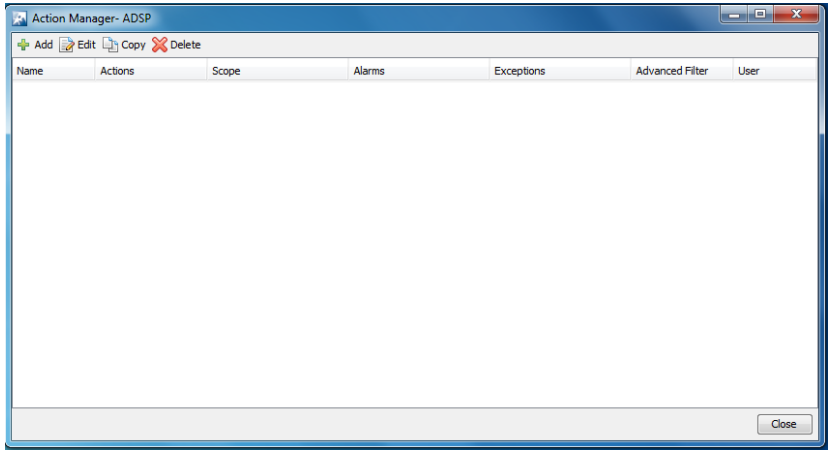

Figure 20: Action Manager Main Window

To select the AP Test action, click the **Add** button and enter the name for action rule, as shown below.

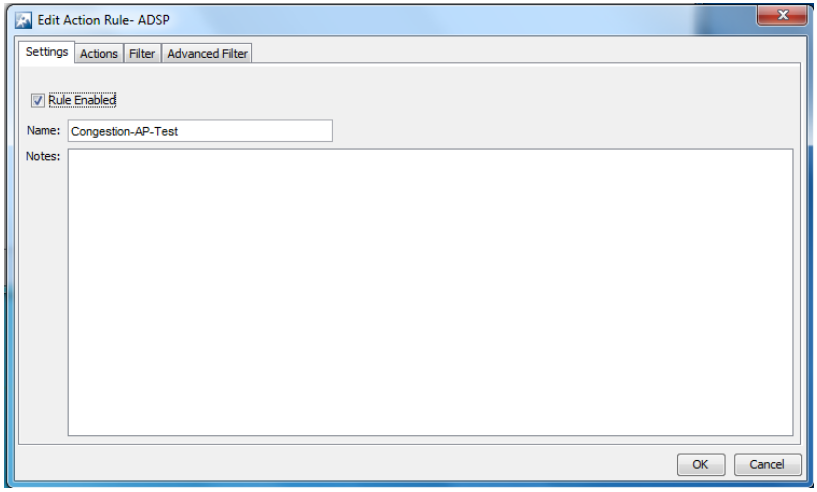

Figure 21: Creating AP Test Action Rule

In the **Action** tab, press the plus (+) button and you will see list of actions. Select **AP Test**, as shown below. The **AP Test** action runs an AP Test using the specified profile if the conditions defined in the **Filter** and **Advanced Filter** tabs are met.

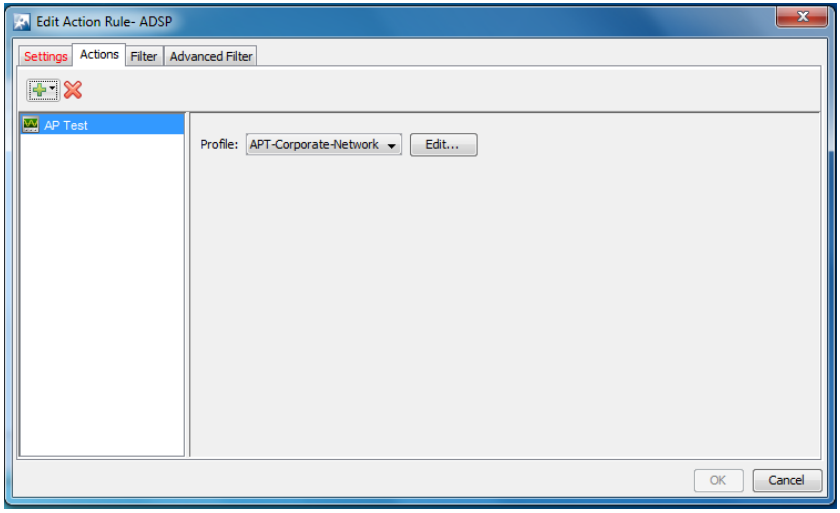

Figure 22: Selecting AP Test Action

The **Filter** tab is where you define the scope, alarms and exceptions for an Action Rule for AP Test, as shown below. If an alarm is raised by devices within the scope selected, ADSP triggers the **AP Test** action. The **Advanced Filter** tab allows you to build a custom alarm filter.

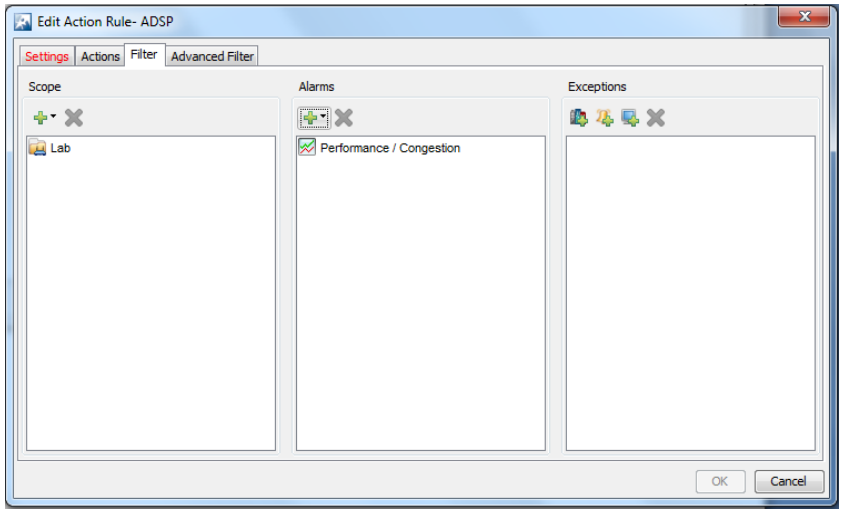

Figure 23: Selecting Scope and Alarms for AP Test Action

5 Interpreting AP Test Alarms

When a scheduled AP Test is carried out on a BSS, AP Test generates alarms if it is unable to reach out to network resources like DHCP, or encounters connectivity failures. These alarms can be viewed from the **Alarms** tab in the main GUI.

To find the description on all alarms related to AP Test you need to perform the steps below.

1. Go to **Configuration** > **Operational Management** > **Alarm Configuration**.
2. Select **Performance** > **AP Testing**.
3. Finally, select the desired alarm and press **View Expert Help** to get details on when this alarm would be generated and how to mitigate this failure condition.

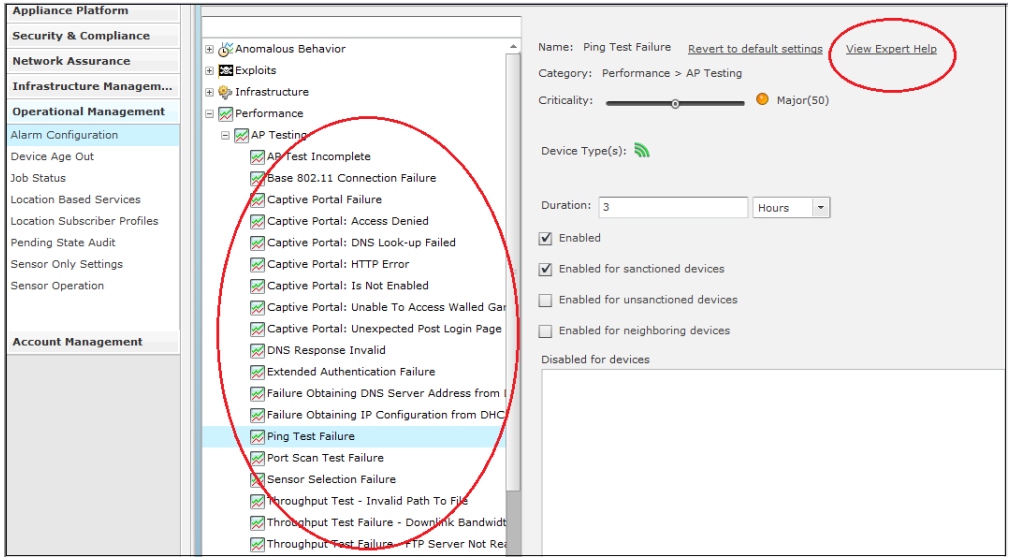

Figure 24: Expert Help on AP Test Alarms

✓ ***NOTE*** The AP Testing alarms are only generated by Scheduled AP Test, not by the on-demand AP Test.

6 Supported Devices

The following table lists the firmware support for sensor and radio-share based AP Testing for various AP models.

Product	Sensor-based AP Test	RadioShare-based AP Test
AP 300	No	No
AP 5131, AP 5181	No	No
AP 510, 520	Yes (From 5.3)	No
AP 7131	Yes (from v5.2.6)	Yes (from v5.2.6)
AP 7161	Yes (from v5.2)	Yes (from v5.2)
AP 650	Yes (from v5.0)	Yes (from v5.2)
AP 6532	Yes (from 5.1)	Yes (from 5.1)
AP 621, AP 6511, AP 622, AP 6521	Yes (from 5.2)	Yes (from 5.2)
AP 7181	Yes (from v5.4)	Yes (from v5.4)
AP 8132	Yes (from v5.4)	Yes (from v5.4)

Table 2: AP/Sensor Matrix for AP Test

For detailed descriptions and installation instructions for specific APs, refer to *ADSP Infrastructure Management Supported Devices* at the following URL: *www.zebra.com/support*.

Zebra Technologies Corporation.
Lincolnshire, IL 60069 USA

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