Wireless Fusion Enterprise Mobility Suite

User Guide for Version 3.00

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Patents

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Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev. A	06/25/09	Initial release.

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About This Guide

Introduction

This guide provides information about using the Fusion Wireless Companion software on a Motorola Enterprise Mobility mobile computer.

✓ ***NOTE*** Screens and windows pictured in this guide are samples and can differ from actual screens.
This guide describes the functionally using Windows Mobile operating system. Functionality for the WIndows CE operating system may differ.

Chapter Descriptions

Topics covered in this guide are as follows:

- *Chapter 1, Getting Started* provides an overview of the Fusion Wireless Companion software.
- *Chapter 2, Find WLAN Application* provides information about the Find WLAN application.
- *Chapter 3, Manage Profiles Application* provides information about managing profiles.
- *Chapter 4, Profile Editor Wizard* explains how to configure a profile.
- *Chapter 5, Manage Certificates Application* explains how to manage certificates.
- *Chapter 6, Manage PACs Application* explains how to manage PACs.
- *Chapter 7, Options* explains how to configure the Fusion options.
- *Chapter 8, Wireless Status Application* describes how to get status about the wireless connection.
- *Chapter 9, Wireless Diagnostics Application* describes tools to help diagnose problems with the wireless connection.
- *Chapter 10, Log On/Off Application* explains how to log on and off the wireless network.
- *Chapter 11, Persistence* explains how to persist Fusion data and settings across a clean/cold boot.
- *Chapter 12, Registry Controlled Features* describes Fusion features that are controlled by registry settings.
- *Chapter 13, Configuration Examples* provides examples for setting up profiles with various authentication and encryption types.

Notational Conventions

The following conventions are used in this document:

- *Italics* are used to highlight the following:
  - Chapters and sections in this and related documents
  - Dialog box, window and screen names
  - Icons on a screen.
- **Bold** text is used to highlight the following:
  - Key names on a keypad
  - Button names on a screen or window.
  - Drop-down list and list box names
  - Check box and radio button names
- bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

✓ ***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.**

Related Documents

- *Enterprise Mobility Developer Kit for C (EMDK for C),* available at: http://www.motorola.com/enterprisemobility/support.
- ActiveSync 4.x software, available at: http://www.microsoft.com.

For the latest version of this guide and all guides, go to: http://www.motorola.com/enterprisemobility/manuals.

Chapter 1 Getting Started

Introduction

Each Motorola Enterprise Mobility mobile computer has a wireless local area network (WLAN) interface. This WLAN interface is controlled by a suite of application software known as Fusion Wireless Companion. The Fusion software allows the user to configure and control the wireless radio in order to securely connect to the WLAN infrastructure. This guide enables the user to configure the mobile computer so that it can connect properly to a WLAN. This guide describes how to use the Fusion software.

Configuring the Infrastructure

WLANs allow mobile computers to communicate wirelessly.Before using the mobile computer on a WLAN, the facility must be set up with the required hardware to run the WLAN (sometimes known as infrastructure). The infrastructure and the mobile computer must both be properly configured to enable this communication.

Refer to the documentation provided with the infrastructure (access points (APs), access ports, switches, Radius servers, etc.) for instructions on how to set up the infrastructure.

Once you have set up the infrastructure to enforce your chosen WLAN security scheme, use the Fusion software to configure the mobile computer to match.

Fusion Overview

The Fusion software contains applications with which to create wireless profiles. Each profile specifies the security parameters to use for connecting to a particular WLAN as identified by its ESSID. The Fusion software also allows the user to control which profile out of a set of profiles is used to connect. Other Fusion applications allow the user to monitor the status of the current WLAN connection and to invoke diagnostic tools for troubleshooting.

The Fusion applications are typically accessed through the pop-up menu associated with the Fusion **Signal Strength** icon. This icon appears in the bottom right hand corner of the screen. To invoke the Fusion **Wireless Applications** menu, tap the icon.

Fusion Signal Strength Icon

The shape and color of the **Signal Strength** icon provides information about the received wireless signal strength for the WLAN connection. *Table 1-1* describes the different icons and their meanings.

Table 1-1 *Signal Strength Icons Descriptions*

Icon	Status	Description
	Excellent signal strength	WLAN network is ready to use.
	Very good signal strength	WLAN network is ready to use.
	Good signal strength	WLAN network is ready to use.
	Fair signal strength	WLAN network is ready to use. Notify the network administrator that the signal strength is only “Fair”.
	Poor signal strength	WLAN network is ready to use. Performance may not be optimum. Notify the network administrator that the signal strength is “Poor”.
	Out-of-network range (not associated)	No WLAN network connection. Notify the network administrator.
	The WLAN radio is disabled.	The WLAN radio is disabled. To enable, choose **Enable Radio** from the **Wireless Applications** menu.
None	The Wireless Launcher application was exited.	The **Wireless Launcher** application has been closed. See the Fusion Functions paragraphs below for how to restart the **Wireless Launcher**.

Fusion Functions

Tap the **Signal Strength** icon to display the **Wireless Launcher** menu.

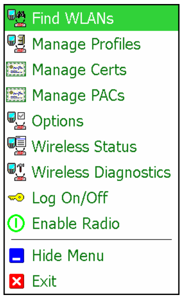


Figure 1-1 *Wireless Launcher Menu*

Many of the items in the menu invoke one of the Fusion applications. These menu items and their corresponding applications are summarized below:

- Find WLANs – Invokes the **Find WLANs** application which displays a list of the WLANs active in your area.

- Manage Profiles – Invokes the **Manage Profiles** application (which includes the **Profile Editor Wizard**) to manage and edit your list of WLAN profiles.
- Manage Certs – Invokes the **Certificate Manager** application which allows you to manage certificates used for authentication.
- Manage PACs – Invokes the **PAC Manager** application which helps you manage the list of Protected Access Credentials used with EAP-FAST authentication.
- Options – Invokes the **Options** application which allows you to configure the Fusion option settings.
- Wireless Status – Invokes the **Wireless Status** application which allows you to view the status of the current wireless connection.
- Wireless Diagnostics – Invokes the **Wireless Diagnostics** application which provides tools with which to diagnose problems with the wireless connection.
- Log On/Off – Invokes the **Network Login** dialog which allows you to log on to a particular profile or to log off from the currently active profile.

Each of the items above has a chapter devoted to it in this guide.

Additional **Wireless Launcher** menu entries include:

- Enable/Disable Radio
- Hide Menu
- Exit.

Enable/Disable Radio

To turn the WLAN radio off, tap the **Signal Strength** icon and select **Disable Radio**.

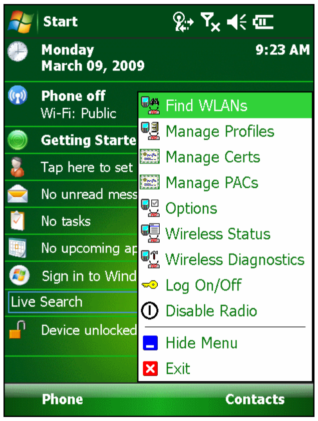


Figure 1-2 *Disable Radio*

To turn the WLAN radio on, tap the **Signal Strength** icon and select **Enable Radio**.

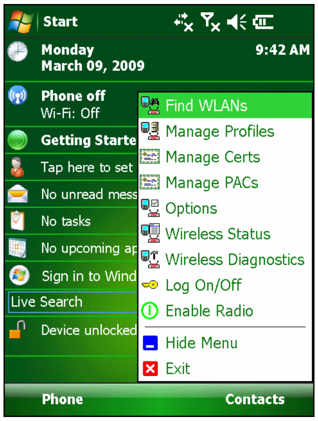


Figure 1-3 *Enable Radio*

Also note that the radio may be enabled or disabled using the **Wireless Manager** screen.

Hide Menu

To hide the menu tap **Hide** in the menu.

Exit

Tap **Exit** to close the menu and exit the **Wireless Launcher** application. A dialog appears to confirm exiting the Wireless Launcher application. Tap **Yes** to exit. This closes the **Wireless launcher** application and removes the **Signal Strength** icon from the screen.

To restart the **Wireless Launcher** application and redisplay the **Signal Strength** icon:

1. Tap **Start** > **Programs** > **Wireless Companion** icon > **Wireless Launch** icon.
2. Tap **ok** twice to close the windows.
3. The **Signal Strength** icon appears on the screen.

Minimum Setup

Below is a list of the minimum effort to achieve a wireless connection. Note that there are many discrete nuances that may affect the performance of your wireless connection that might be missed if you do not consider them carefully.

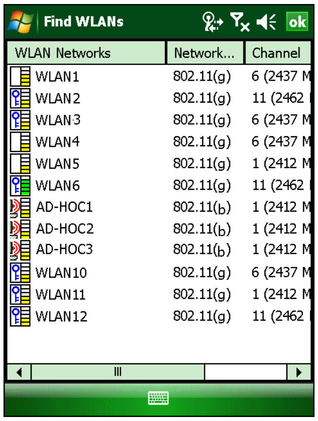
You will need to create a profile. It is recommended that you read the profile editor chapter.

1. Find out from your IT administrator what the connection settings should be (Service Set Identifier (SSID), Enterprise or Personal, 1x type, tunnel type, certificate requirements, Protected Access Credentials (PAC) requirements). Note that not all of the items listed may be relevant.
2. Create the profile using the information provided by the IT administrator.
3. Enter the **Manage Profile** screen, select the profile (press and hold), and select the **Connect** option in the context menu that appears.

Chapter 2 Find WLAN Application

Introduction

Use the **Find WLANs** application to discover available networks in the vicinity of your and mobile computer. To open the **Find WLANs** application, tap the **Signal Strength** icon > **Find WLANs**. The **Find WLANs** window displays.



WLAN Networks	Network...	Channel
WLAN1	802.11(g)	6 (2437 M
WLAN2	802.11(g)	11 (2462
WLAN3	802.11(g)	6 (2437 M
WLAN4	802.11(g)	6 (2437 M
WLAN5	802.11(g)	1 (2412 M
WLAN6	802.11(g)	11 (2462
AD-HOC1	802.11(b)	1 (2412 M
AD-HOC2	802.11(b)	1 (2412 M
AD-HOC3	802.11(b)	1 (2412 M
WLAN10	802.11(g)	6 (2437 M
WLAN11	802.11(g)	1 (2412 M
WLAN12	802.11(g)	11 (2462

Figure 2-1 *Find WLANs Window*

The **Find WLANs** list displays:

- WLAN Networks - Available wireless networks, (both infrastructure and Ad-hoc) with icons that indicate signal strength and encryption. The signal strength and encryption icons are described in *Table 2-1* and *Table 2-2*.
- Network Type - Type of network. 802.11(a), 802.11(b) or 802.11(g).
- Channel - Channel on which the AP/Ad-hoc peer is transmitting.
- Signal Strength - The signal strength of the signal from the AP/Ad-hoc peer.

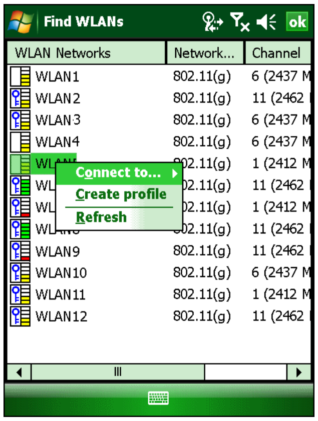
Table 2-1 *Signal Strength Icon*

Icon	Description
🟩	Excellent signal
🟩	Very good signal
🟨	Good signal
🟨	Fair signal
🟥	Poor signal
❗	Out of range or no signal

Table 2-2 *Encryption Icon*

Icon	Description
□	No encryption. WLAN is an infrastructure network.
((•))	WLAN is an Ad-hoc network.
🔑	WLAN uses encryption. WLAN is an infrastructure network.

Tap-and-hold on a WLAN network to open a pop-up menu which provides three options: **Connect to**, **Create profile** and **Refresh**.



Find WLANs

WLAN Networks	Network...	Channel
WLAN1	802.11(g)	6 (2437 M
WLAN2	802.11(g)	11 (2462
WLAN3	802.11(g)	6 (2437 M
WLAN4	802.11(g)	6 (2437 M
WL	02.11(g)	1 (2412 M
WL	02.11(g)	11 (2462
WL	02.11(g)	1 (2412 M
WL	02.11(g)	11 (2462
WLAN9	802.11(g)	11 (2462
WLAN10	802.11(g)	6 (2437 M
WLAN11	802.11(g)	1 (2412 M
WLAN12	802.11(g)	11 (2462

Figure 2-2 *Find WLANs Menu*.

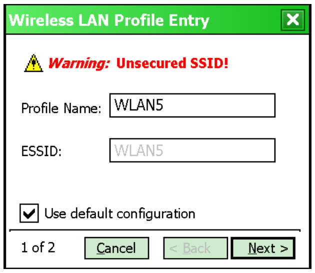
✓ ***NOTE*** The number of WLANs (ESSIDs) that can be detected by the wireless radio at one time is limited. If you have a large number of WLANs active in your area, the Find WLANs window may not display them all.

If you do not see your ESSID, try a **Refresh**. If your ESSID is still not displayed and you wish to create or connect to a profile for it, you will need to use the **Manage Profiles** application.

Select **Connect *to*** to view the list of existing profiles matching the select ESSID. The mobile computer connects to the given profile upon selection.

Select **Create profile** to create a new WLAN profile for that network. This starts the **Profile Editor Wizard** which allows you to configure the security parameters that your mobile computer will use for the selected network. After editing the profile, the mobile computer automatically connects to this new profile.

NOTE A warning displays when connecting to an unsecure (or open) network via the **Find WLANs** application. For open WLANs, the profile's settings will take on automatically generated default values. If you wish to manually configure the settings, uncheck the Use Default configuration checkbox.



Wireless LAN Profile Entry

Warning: **Unsecured SSID!**

Profile Name: WLAN5

ESSID: WLAN5

☑ Use default configuration

1 of 2

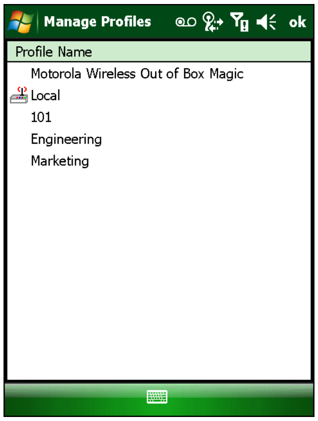
Figure 2-3 *Warning Notice*

Select **Refresh** to refresh the WLAN list.

Chapter 3 Manage Profiles Application

Introduction

A profile is a set of operating parameters that define how the mobile computer will connect to a specific WLAN. Create different profiles for use in different network environments. The **Manage Profiles** application displays the list of user-created wireless profiles. You may have a maximum of 32 profiles at any one time. To open the **Manage Profiles** application, tap the **Signal Strength** icon > **Manage Profiles**.



Manage Profiles ok

Profile Name

Motorola Wireless Out of Box Magic
Local
101
Engineering
Marketing

Figure 3-1 *Manage Profiles Window*

Icons next to each profile identify the profile’s current state.

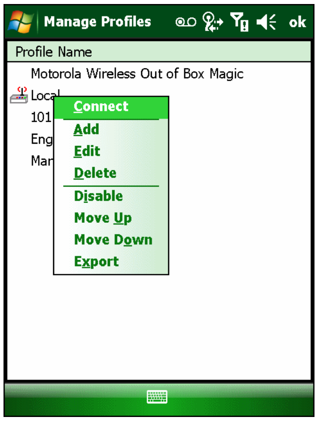
Table 3-1 *Profile Icons*

Icon	Description
No Icon	Profile is not selected, but enabled.
🚫	Profile is disabled.
⊗	Profile is cancelled. A cancelled profile is disabled until you connect to it, either by selecting **Connect** from the pop-up menu, or by using the **Log On/Off** application.

Table 3-1 *Profile Icons (Continued)*

Icon	Description
	Profile is in use and describes an infrastructure profile not using security.
	Profile is in use and describes an infrastructure profile using security.
	Profile is in use and describes an ad-hoc profile not using security.
	Profile is in use and describes an ad-hoc profile using security.
⚠	Profile is not valid in the regulatory domain in which the device is currently operating.

You can perform various operations on the profiles in the list. To operate on an existing profile, tap and hold it in the list and select an option from the menu to connect, edit, disable (enable), or delete the profile. (Note that the **Disable** menu item changes to **Enable** if the profile is already disabled.)



Manage Profiles ok

Profile Name

Motorola Wireless Out of Box Magic

Local

101

Eng

Mar

Figure 3-2 *Manage Profiles Context Menu*

Connect to a Profile

Tap and hold a profile and select **Connect** from the pop-up menu to set this as the active profile.

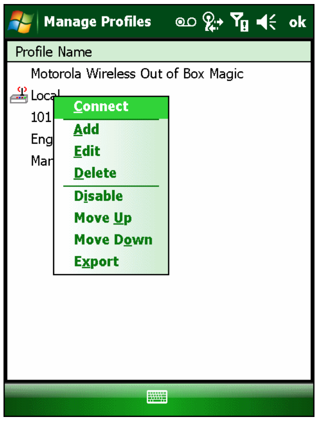


Figure 3-3 *Manage Profiles - Connect*

Once selected, the mobile computer uses the settings configured in the profile (i.e., authentication, encryption, ESSID, IP Config, power consumption, etc.) to connect to a WLAN.

Editing a Profile

Tap and hold a profile and select **Edit** from the pop-up menu.This will invoke the **Profile Wizard** where the profile settings are configured.

Creating a New Profile

To create a new profile tap and hold anywhere in the **Manage Profiles** window and select **Add** from the pop-up menu.

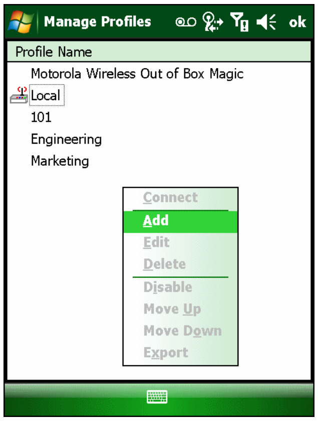


Figure 3-4 *Manage Profiles - Add*

Selecting **Add** invokes the **Profile Wizard** wherein the settings for the new profile are configured, such as profile name, ESSID, security, network address information, and the power consumption level.

Deleting a Profile

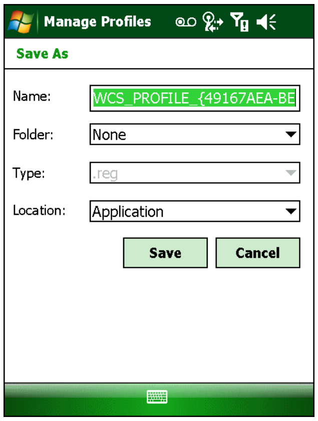
To delete a profile from the list, tap and hold the profile and select **Delete** from the pop-up menu. A confirmation dialog box appears.

Ordering Profiles

The profiles are listed in priority order for use by the automatic Profile Roaming feature (see *Profile Roaming* below). Change the order by moving profiles up or down. Tap and hold a profile from the list and select **Move Up** or **Move Down** from the pop-up menu.

Export a Profile

To export a profile to a registry file, tap and hold a profile from the list and select **Export** from the pop-up menu. The **Save As** dialog box displays with the **Application** folder and a default name of WCS_PROFILE{*profile GUID*}.reg (Globally Unique Identifier).



Name: WCS_PROFILE_{49167AEA-BE
Folder: None
Type: .reg
Location: Application

Figure 3-5 *Save As Dialog Box*

If required, change the name in the **Name** field and tap **Save**. A confirmation dialog box appears after the export completes.

Profile Roaming

Profile Roaming attempts to automatically select and connect to a profile from the profile list displayed in the **Manage Profiles** window. The Profile Roaming algorithm uses the order of the profiles in the profile list to determine the order in which profiles are tried.

NOTE Profile Roaming must be enabled in the **Options** application. See *Chapter 7, Options*.

The Profile Roaming algorithm makes two passes through the profile list. The first pass attempts to connect only to profiles that specify ESSIDs that can be detected by the wireless radio. If no connection is made, a second pass through the list is performed attempting to connect to those profiles that were not tried in the first pass. The Profile

Roaming algorithm will only attempt to connect to a profile for which it is not necessary to prompt the user for credentials (i.e., username and password). This includes:

- A profile that does not require credentials.
- A device profile. A device profile is one in which the username and password have been pre-entered directly into the profile. (A profile with the username specified but with the password field left empty is still considered a device profile since an empty password is considered a valid password.)
- A user profile with cached credentials. A user profile is one in which the username and password have not been pre-entered into the profile. A profile has cached credentials if the user has entered credentials for the profile via the Network Login dialog. When a profile has cached credentials, the user is said to have logged on to the profile. See *Chapter 10, Log On/Off Application* for more information.

The Profile Roaming algorithm will not attempt to connect to:

- A profile that specifies EAP-GTC for its Tunnel Authentication Type and Token (as opposed to Static) for its password type. See *Tunneled Authentication on page 4-7* for more information.
- A user profile without cached credentials.
- A user profile that has cached credentials but that also has the At-Connect option enabled. See *Credential Cache Options on page 4-15* for more information.
- A device profile that has cached credentials because the user has logged on to it (called a user-override profile), but that also has the **At-Connect** option enabled.
- A profile that has been disabled.
- A profile that has been cancelled.
- A profile whose **Country** setting does not allow the profile to be used in the country in which the mobile computer is being operated. See *Operating Mode on page 4-2* for more information.

The Profile Roaming algorithm is invoked whenever the mobile computer becomes disconnected (disassociated) from the current WLAN.

Chapter 4 Profile Editor Wizard

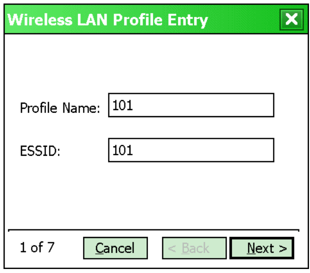
Introduction

Use the **Profile Editor Wizard** to create a new WLAN profile or edit an existing profile. If editing a profile, the fields reflect the current settings for that profile. If creating a new profile, default values appear in the fields.

Navigate through the wizard using the **Next** and **Back** buttons. An indicator in the bottom left corner tracks the number of pages traversed and total number of pages required to complete the current profile configuration. Tap **X** or the **Cancel** button to quit. On the confirmation dialog box, tap **No** to return to the wizard or tap **Yes** to quit and return to the **Manage Profiles** window. See *Chapter 3, Manage Profiles Application* for instructions on navigating to and from the **Profile Editor Wizard**.

Profile Name

In the **Profile Name** dialog box in the **Profile Editor Wizard**, enter the profile name and the ESSID.



Wireless LAN Profile Entry

Profile Name: 101

ESSID: 101

Figure 4-1 *Profile Name Dialog Box*

Table 4-1 *Profile Name Fields*

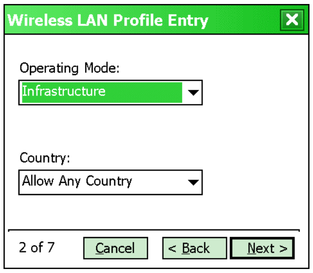
Field	Description
Profile Name	The user-friendly name you wish to give the profile. The profile name is limited to 64 characters. Example: The Public LAN.
ESSID	The ESSID is the 802.11 extended service set identifier. The ESSID is a 32-character (maximum) case sensitive string identifying the WLAN, and must match the AP ESSID for the mobile computer to communicate with the AP.

✓ ***NOTE*** Two profiles with the same user friendly name are acceptable but not recommended.

Tap **Next.** The **Operating Mode** dialog box displays.

Operating Mode

Use the **Operating Mode** dialog box to select the operating mode (Infrastructure or Ad-hoc) and the country location.



Wireless LAN Profile Entry

Operating Mode: Infrastructure

Country: Allow Any Country

Figure 4-2 *Operating Mode Dialog Box*

Table 4-2 *Operating Mode Fields*

Field	Description
Operating Mode	Select **Infrastructure** to enable the mobile computer to transmit and receive data with an AP. Infrastructure is the default mode. Select **Ad-hoc** to enable the mobile computer to form its own local network where mobile computers communicate peer-to-peer without APs using a shared ESSID.
Country	**Country** determines if the profile is valid for the country of operation. The profile country must match the country in the options page or it must match the acquired country if 802.11d is enabled.Note that the 802.11d setting only applies to infrastructure profiles, not to Ad-hoc profiles.

Table 4-3 defines the regulatory validity of profiles that use infrastructure mode:

Table 4-3 *Profile Regulatory Validity for Infrastructure Mode*

802.11d Settings	Profile Country Settings	Fusion Options Country Settings	Country Code Acquired from Infrastructure	Regulatory Validity
Enabled	Any Country	N/A	Country X	Valid
Enabled	Country X	N/A	Country X	Valid
Enabled	Country X	N/A	Country Y	Invalid
Disabled	Any Country	Country Y	N/A	Valid
Disabled	Country X	Country X	N/A	Valid
Disabled	Country X	Country Y	N/A	Invalid

Table 4-4 defines the regulatory validity of profiles that use ad-hoc mode:

Table 4-4 *Profile Regulatory Validity for Ad-hoc Mode*

802.11d Settings	Profile Country Settings	Fusion Options Country Settings	Country Code Acquired from Infrastructure	Regulatory Validity
N/A	Country X	Country X	N/A	Valid
N/A	Country X	Country Y	N/A	Invalid

Tap **Next**. If **Ad-hoc** mode was selected the **Ad-hoc Channel** dialog box displays. If **Infrastructure** mode was selected the **Security Mode** dialog box displays. See *Encryption on page 4-17* for instruction on setting up authentication.

Ad-hoc

Use the **Ad-hoc Channel** dialog box to configure the required information to create an Ad-hoc profile. This dialog box does not appear if you selected **Infrastructure** mode.

1. Select a channel number from the **Channel** drop-down list.

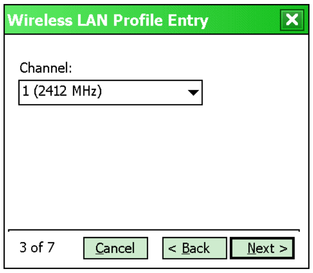


Figure 4-3 *Ad-hoc Channel Selection Dialog Box*

✓ ***NOTE*** In the case of a country where Dynamic Frequency Selection (DFS) is implemented in band 5150-5250 MHz, Ad-hoc is not allowed and the user needs to move and select a channel in the 2.4 GHz band.

✓ ***NOTE*** Ad-hoc channels are specific to the country selected.

Table 4-5 *Ad-hoc Channels*

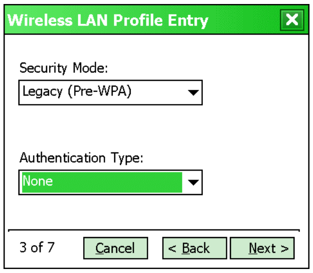
Band	Channel	Frequency
2.4 GHz	1	2412 MHz
	2	2417 MHz
	3	2422 MHz
	4	2427 MHz
	5	2432 MHz
	6	2437 MHz
	7	2442 MHz
	8	2447 MHz
	9	2452 MHz
	10	2457 MHz
	11	2462 MHz
	12	2467 MHz
	13	2472 MHz
	14	2484 MHz
5 GHz	36	5180 MHz
	40	5200 MHz
	44	5220 MHz
	48	5240 MHz

2. Tap **Next**. The **Encryption** dialog box displays. See *Encryption on page 4-17* for encryption options.

Security Mode

✓ ***NOTE*** **Security Mode** dialog box only appears when **Infrastructure** mode is selected in the **Operating Mode** dialog box.

Use the **Security Mode** dialog box to configure the Security and Authentication methods. If **Ad-hoc** mode is selected, this dialog box is not available and authentication is set to **None** by default.



Wireless LAN Profile Entry

Security Mode: Legacy (Pre-WPA)

Authentication Type: None

3 of 7

Figure 4-4 *Authentication Dialog Box*

Select the security mode from the **Security Mode** drop-down list. The selection chosen affects the availability of other choices for Authentication Type and Encryption methods.

- Legacy (Pre - WPA) - This mode allows the user to configure protocols not available in the other Security Mode selections: Open authentication / encryption; Open authentication with WEP-40 or WEP-104; and 802.1X authentications that use WEP-104 Encryption.
- WPA - Personal - This mode allows the user to configure a WPA-TKIP-PSK protocol.
- WPA2 - Personal - This mode allows the user to configure WPA2-PSK protocols with TKIP or Advanced Encryption Standard (AES) encryption method.
- WPA - Enterprise - This mode allows the user to configure profiles with 802.1X Authentication that uses WPA with TKIP encryption method. Required for enabling Cisco Centralized Key management (CCKM) in the profile.
- WPA2 - Enterprise - This mode allows the user to configure profiles with 802.1X Authentication that uses WPA2 with TKIP or AES encryption method.

Table 4-6 *Security Modes*

Security Mode	Authentication Types	Encryption Types	Pass-phrase/Hexkey Configuration
Legacy (Pre-WPA)	None, EAP-TLS, EAP-FAST, PEAP, LEAP, TTLS	Open, WEP-40 (40/24), WEP-104 (104/24)	Enabled for Authentication Type “None.” User input required with pass-phrase/hex key configuration. Disabled for all other Authentication Types. No user input required for encryption key.
WPA - Personal	None	TKIP	Enabled. User input required with pass-phrase/hex key configuration.
WPA2 - Personal	None	TKIP AES	Enabled. User input required with pass-phrase/hex key configuration.
WPA - Enterprise	EAP-TLS, EAP-FAST, PEAP, LEAP, TTLS	TKIP	Disabled. No user input required for encryption key.
WPA2 - Enterprise	EAP-TLS, EAP-FAST, PEAP, LEAP, TTLS	TKIP AES	Disabled. No user input required for encryption key.

Authentication Type

Select an available authentication type from the drop-down list. The options listed in the drop-down list are based on the selected Security Mode as shown in *Table 4-6*.

The authentication types, other than **None**, all use IEEE 802.1x authentication to ensure that only valid users and sometimes servers can connect to the network. Each authentication type uses a different scheme using various combinations of tunnels, username/passwords, user certificates, server certificates, and Protected Access Credentials (PACs).

Table 4-7 *Authentication Options*

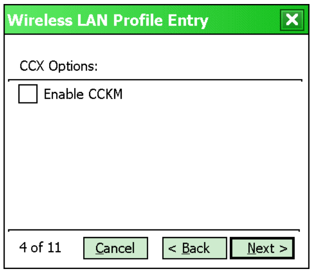
Authentication	Description
None	Use this setting when authentication is not required on the network.
EAP-TLS	Select this option to enable EAP-TLS authentication. A user certificate is required; validating the server certificate is optional.
EAP-FAST	Select this option to enable EAP-FAST authentication. This type uses a Protected Access Credential (PAC) to establish a tunnel and then uses the selected tunnel type to verify credentials. PACs are handled behind the scenes, transparently to the user. Automatic PAC provisioning can, depending on the tunnel type and the RADIUS server settings, require a user certificate and the validation of a server certificate.
PEAP	Select this option to enable PEAP authentication. This type establishes a tunnel and then based on the tunnel type, uses a user certificate and/or a username/password. Validating the server certificate is optional.
LEAP	Select this option to enable LEAP authentication. This type does not establish a tunnel. It requires a username and password.
TTLS	Select this option to enable TTLS authentication. This type establishes a tunnel in which the username/password are verified. A user certificate may optionally be used. Validating the server certificate is also optional.

Tap **Next**. Selecting **PEAP**, **TTLS** or **EAP-FAST** displays the **Tunneled Authentication Type** dialog box. Selecting **None** displays the **Encryption** dialog box. Selecting **EAP-TLS** displays the **Installed User Certs** dialog box. Selecting **LEAP** displays the **User Name** dialog box.

CCX Options

✓ ***NOTE*** **CCX Options** dialog box only appears when the **WPA - Enterprise** security mode is selected in the **Security Mode** dialog box.

Use the **CCX Options** dialog box to configure specific Cisco Compatible Extensions options.



Wireless LAN Profile Entry

CCX Options:

□ Enable CCKM

4 of 11

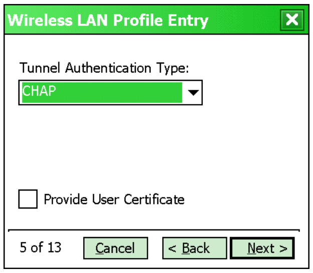
Figure 4-5 *CCX Options Dialog Box*

Table 4-8 *CCX Options*

Field	Description
Enable CCKM	Check to enable CCKM for fast roaming. CCKM must be supported by your wireless infrastructure. Note: the TKIP encryption method is supported for WPA profiles configured to use CCKM.

Tunneled Authentication

Use the **Tunneled Authentication Type** dialog box to select the tunneled authentication options. The content of the dialog will differ depending on the **Authentication Type** chosen.



Wireless LAN Profile Entry

Tunnel Authentication Type: CHAP

□ Provide User Certificate

5 of 13

Figure 4-6 *Tunneled Authentication Dialog Box*

To select a tunneled authentication type:

1. Select a tunneled authentication type from the drop-down list. See *Table 4-9* for the Tunnel authentication options for each authentication type.
2. Select the **Provide User Certificate** check box if a certificate is required. If the TLS tunnel type that requires a user certificate is selected, the check box is already selected.
3. Tap **Next**. The **Installed User Certificates** dialog box appears.

Table 4-9 *Tunneled Authentication Options*

Tunneled Authentication	Authentication Type			Description
	PEAP	TTLS	EAP-FAST	
CHAP		X		Challenge Handshake Authentication Protocol (CHAP) is one of the two main authentication protocols used to verify the user name and password for Point-to-Point (PPP) Internet connections. CHAP is more secure than Password Authentication Protocol (PAP) because it performs a three way handshake during the initial link establishment between the home and remote machines. It can also repeat the authentication anytime after the link is established.
EAP-GTC	X		X	Extensible Authentication Protocol-Generic Token Card (EAP-GTC) is used during phase 2 of the authentication process. This method uses a time-synchronized hardware or software token generator, often in conjunction with a user PIN, to create a one-time password.
MD5		X		Message Digest-5 (MD5) is an authentication algorithm developed by RSA. MD5 generates a 128-bit message digest using a 128-bit key, IPSec truncates the message digest to 96 bits.
MS CHAP		X		Microsoft Challenge Handshake Authentication Protocol (MS CHAP) is an implementation of the CHAP protocol that Microsoft created to authenticate remote Windows workstations. MS CHAP is identical to CHAP, except that MS CHAP is based on the encryption and hashing algorithms used by Windows networks, and the MS CHAP response to a challenge is in a format optimized for compatibility with Windows operating systems.
MS CHAP v2	X	X	X	Microsoft Challenge Handshake Authentication Protocol version 2 (MS CHAP v2) is a password-based, challenge-response, mutual authentication protocol that uses the industry-standard Message Digest 4 (MD4) and Data Encryption Standard (DES) algorithms to encrypt responses. The authenticating server challenges the access client and the access client challenges the authenticating server. If either challenge is not correctly answered, the connection is rejected. MS CHAP v2 was originally designed by Microsoft as a PPP authentication protocol to provide better protection for dial-up and virtual private network (VPN) connections. With Windows XP SP1, Windows XP SP2, Windows Server 2003, and Windows 2000 SP4, MS CHAP v2 is also an EAP type.
PAP		X		PAP has two variations: PAP and CHAP PAP. It verifies a user name and password for PPP Internet connections, but it is not as secure as CHAP, since it works only to establish the initial link. PAP is also more vulnerable to attack because it sends authentication packets throughout the network. Nevertheless, PAP is more commonly used than CHAP to log in to a remote host like an Internet service provider.
TLS	X		X	EAP-TLS is used during phase 2 of the authentication process. This method uses a user certificate to authenticate.

User Certificate Selection

If the user checked the **Provide User Certificate** check box on the **Tunneled Authentication** dialog box or if **TLS** is the selected authentication type, the **Installed User Certificates** dialog box displays. Select a certificate from the drop-down list of currently installed certificates before proceeding. The selected certificate's name appears in the drop-down list. If the required certificate is not in the list, install it.

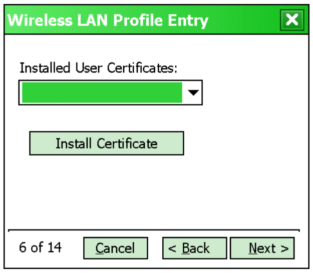


Figure 4-7 *Installed User Certificates Dialog Box*

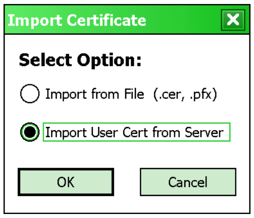
User Certificate Installation

NOTE User Certificates can also be installed using the **Manage Certificates** Application. See *Chapter 5, Manage Certificates Application* for more information.

There are two methods available to install a user certificate for authentication. The first is to obtain the user certificate from the Certificate Authority (CA). This requires connectivity with that CA. The second method is to install the user certificate from a .pfx file that has been manually placed on the device.

To install a user certificate from the CA:

1. Tap **Install Certificate**. The **Import Certificate** dialog box appears.



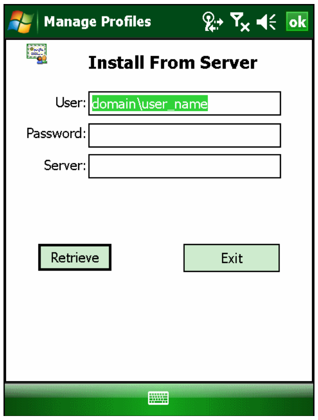
Select Option:

○ Import from File (.cer, .pfx)

● Import User Cert from Server

Figure 4-8 *Import Certificate Dialog Box*

2. Select **Import User Cert from Server** and tap **OK.** The **Install from Server** dialog box appears.



User: domain\user_name

Password:

Server:

Figure 4-9 *Install from Server Dialog Box*

3. Enter the User:, Password: and Server: information in their respective text boxes.

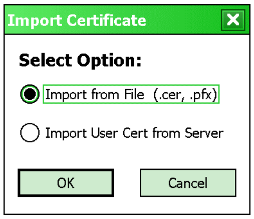
4. Tap **Retrieve**. A Progress dialog indicates the status of the certificate retrieval or tap **Exit** to exit.

After the installation completes, the **Installed User Certs** dialog box displays and the certificate is available in the drop-down for selection.

✓ ***NOTE*** To successfully install a user certificate from a server, the mobile computer must already be connected to a network from which that server is accessible.

To install a user certificate from a .pfx file:

1. Tap **Install Certificate**. The **Import Certificate** dialog box appears.



Select Option:

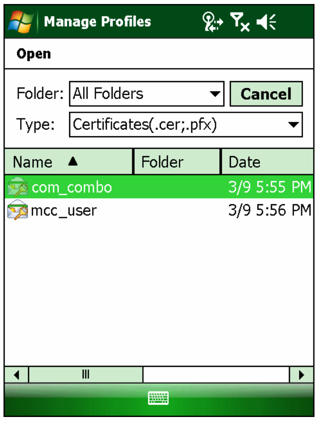
● Import from File (.cer, .pfx)

○ Import User Cert from Server

Figure 4-10 *Import Certificate Dialog Box*

2. Choose **Import from File** and tap **OK**.

   The **Open** dialog box appears.



Folder: All Folders

Type: Certificates(.cer;.pfx)

Name ▲	Folder	Date
com_combo		3/9 5:55 PM
mcc_user		3/9 5:56 PM

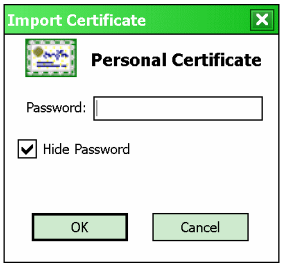
Figure 4-11 *Open Dialog Box*

3. In the **Type** drop-down list, select **Certificates (.cer, .pfx)**.

✓ ***NOTE*** Installing a user certificate from a file requires that the file be of type ***.pfx**.

4. Browse to the desired .pfx file and tap **OK**.

   The **Personal Certificate** dialog box appears.


Import Certificate

Personal Certificate

Password:

☑ Hide Password

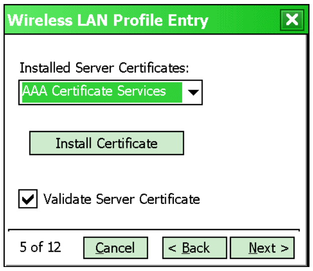
Figure 4-12 *Personal Certificate Window*

5. If the .pfx file is password protected, enter the appropriate password; else leave the password fields empty. Deselect the **Hide Password** check box to see the password characters as they are entered.

6. Tap **OK.** The certificate(s) are imported.

Server Certificate Selection

If the user selects the **Validate Server Certificate** check box, a server certificate is required. Select a certificate from the drop-down list of currently installed certificates in the **Installed Server Certificates** dialog box. An hour glass may appear as the wizard populates the existing certificate list. If the required certificate is not listed, install it.


Wireless LAN Profile Entry

Installed Server Certificates: AAA Certificate Services

☑ Validate Server Certificate

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Figure 4-13 *Installed Server Certificates Dialog Box*

Server Certificate Installation

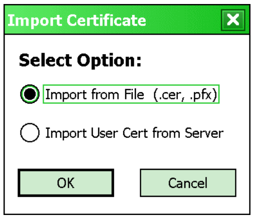
✓ ***NOTE*** Server Certificates can also be installed using the **Manage Certificates** Application. See *Chapter 5, Manage Certificates Application* for more information.

A server certificate can only be installed from either a .cer file or a .pfx file that has been loaded onto the device. The certificate file can be loaded either manually or via a web-browser-based interface to the Certificate Authority (CA).

✓ ***NOTE*** To successfully install a server certificate from a CA using a web-browser, the mobile computer must already be connected to a network from which that CA is accessible. The procedure you should follow to download the server certificate from the CA is beyond the scope of this guide.

To install a server certificate for authentication:

1. Tap **Install Certificate**. The **Import Certificate** dialog box appears. Choose **Import from File (.cer, .pfx)** and tap **OK**.



Import Certificate

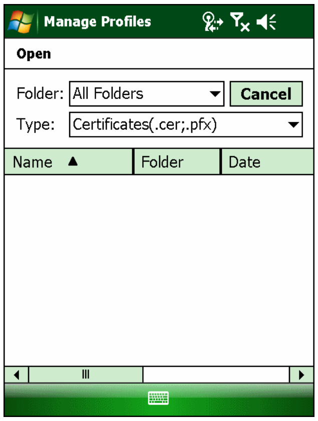
Select Option:

● Import from File (.cer, .pfx)

○ Import User Cert from Server

Figure 4-14 *Import Certificates Dialog Box*

2. A dialog box appears that lists the certificate files found with the default extension.



Manage Profiles

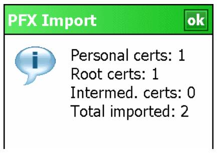
Open

Folder: All Folders

Type: Certificates(.cer;.pfx)

Figure 4-15 *Open Window*

3. Browse to the file and tap **OK**.
4. A confirmation dialog verifies the installation. If the information in this dialog is correct, tap the Yes button, If the information in this dialog is not correct tap the No button. The wizard returns to the **Installed Server Certs** dialog box. Select the newly-installed certificate from the drop down list.



PFX Import

Personal certs: 1
Root certs: 1
Intermed. certs: 0
Total imported: 2

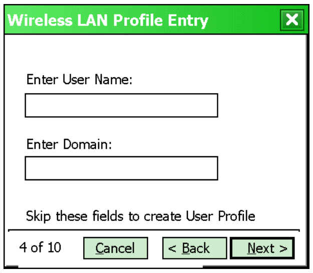
Figure 4-16 *Confirmation Dialog Box*

User Name

The user name and password can optionally be entered when the profile is created (called a device profile) or they can be left empty (called a user profile). If the username and password are not entered in the profile, then when attempting to connect, the user will be prompted to supply them. The entered information (credentials) will be saved (cached) for future reconnections.

Whether a profile is a device or a user profile affects how the profile is treated during a Profile Roaming operation (see *Profile Roaming on page 3-4*). Profiles are excluded from profile roaming consideration if they require user entry of credential information.

If the profile uses an authentication tunnel type of EAP-GTC and Token is selected (see *Encryption on page 4-17*), then you can control certain behavior by whether you choose to enter a value in the **Enter User Name** field. If you enter a value in the **Enter User Name** field, then whenever the Fusion software prompts you to enter credentials, the username field in the interactive credential dialog will be initialized with the value that you entered when you created the profile. If you enter a different value in the username field of the interactive credential dialog, it is cached and used to initialize the username field the next time the interactive credential dialog is shown for that profile. If you do not enter a value in the **Enter User Name** field when you create an EAP-GTC token profile, then the username field in the interactive credential dialog is initialized to blank. After you enter a username in the interactive credential dialog, it is cached as usual, but it is not be used to initialize the username field the next time the interactive credential dialog is shown for that profile; the username field will still be initialized to blank. In summary, the user can control whether the username field in the interactive credential dialog box is initialized, either with the last-interactively-entered username for that profile or with the username entered into the profile, by whether any value is entered in the **Enter User Name** field during profile entry.


Wireless LAN Profile Entry

Enter User Name:

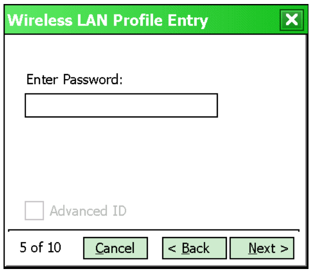
Enter Domain:

Skip these fields to create User Profile

Figure 4-17 *Username Dialog Box*

Password

Use the **Password** dialog box to enter a password. If EAP-TLS is the selected authentication type, the password dialog box does not display. Note that if a username was entered and no password is entered, Fusion assumes that no password is a valid password.


Wireless LAN Profile Entry

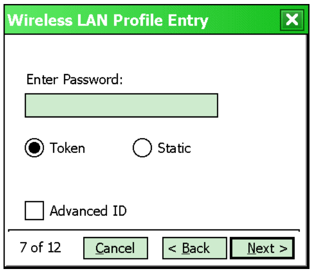
Enter Password:

□ Advanced ID

Figure 4-18 *Password Dialog Box*

1. Enter a password in the **Enter Password** field.

   If an authentication tunnel type of EAP-GTC is used, a **Password** dialog box with additional radio buttons displays.


Wireless LAN Profile Entry

Enter Password:

● Token ○ Static

□ Advanced ID

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Figure 4-19 *EAP-GTC Password Dialog Box*

Two radio buttons are added to allow the user to choose a token or static password.

Choose the **Token** radio button when using the profile in conjunction with a token generator (hardware or software). The system administrator should supply the user with a token generator for use with EAP-GTC token profiles. A token generator generates a numeric value that is entered into the password field at connect time, usually along with a PIN. Tokens have a very limited lifetime and usually expire within 60 seconds. The token generator is time-synchronized with a token server. When authenticating, the RADIUS server asks the token server to verify the token entered. The token server knows what value the token generator generates given the time of day and the username. Since tokens expire, EAP-GTC token profiles are treated differently. A prompt appears at the appropriate time to enter a token, even if a token has previously been entered. Tokens are never cached in the credential cache (though the username that is entered when the token is entered is cached).

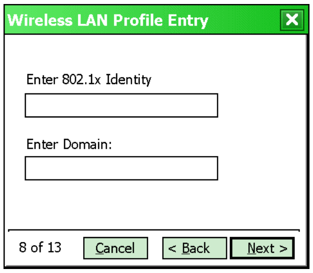
If the **Static** radio button is selected, the **Enter Password** field is enabled and a password can be entered if desired. A profile that uses an EAP-GTC tunnel type with a static password is handled in the same manner as other profiles that have credentials that don't expire.

1. Select the **Advanced ID** check box, if advanced identification is desired.
2. Tap **Next.** The **Prompt for Login at** dialog box displays. See *Credential Cache Options on page 4-15*.

Advanced Identity

Use the **Advanced ID** dialog box to enter the 802.1x identity to supply to the authenticator. This value can be 63 characters long and is case sensitive. For TTLS,EAP-FAST, and PEAP authentication types, it is recommended entering the identity *anonymous* (rather than a true identity). You can optionally enter a fully qualified domain (e.g., mydomain.local) and it will automatically be combined with the 802.1x identity (i.e., anonymous@mydomain.local) before being sent to the RADIUS server.

Entering an 802.11x Identity is required before proceeding.


Wireless LAN Profile Entry

Enter 802.1x Identity

Enter Domain:

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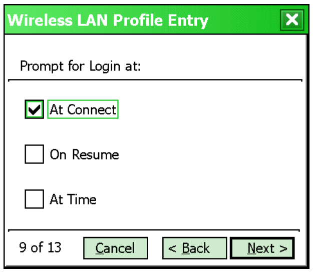
Figure 4-20 *Advanced Identity Dialog Box*

Tap **Next**. The **Encryption** dialog box displays.

Credential Cache Options

When connecting to a password-based user profile for the first time, Fusion will prompt the user to enter credentials. After the credentials have been entered, they are cached. These cached credentials will normally be used, without prompting the user, whenever Fusion reconnects to that profile, The credential caching options allow the administrator to specify additional circumstances under which Fusion will prompt the user to re-enter the credentials even though it already has cached credentials for the given profile.   Requiring the user to re-enter credentials can help ensure that only an authorized user is using the device.

The credential caching options are at connection, on each resume, or at a specified time.



Wireless LAN Profile Entry

Prompt for Login at:

☑ At Connect

□ On Resume

□ At Time

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Figure 4-21 *Prompt for Login at Dialog Box*

NOTE Credential caching options only apply to user profiles and to user-override profiles (a device profile that a user has logged on to using the Log On/Off command). Credential caching options do not apply to device profiles. You are allowed to set the options for a device profile so that they will have an effect if you convert the profile to a user-override profile by logging on to it using the Log On/Off command.

If the mobile computer does not have the credentials, a username and password must be entered. If the mobile computer has the credentials (previous entered via a login dialog box), it uses these credentials unless the caching options require the mobile computer to prompt for new credentials. If credentials were entered via the profile, the mobile computer does not prompt for new credentials (except for profiles where the credentials expire, such as EAP-GTC token profiles). *Table 4-10* lists the caching options.

Table 4-10 Cache Options

Option	Description
At Connect	Select this option to have the mobile computer prompt for credentials each time it tries to connect. Deselect this to use the cached credentials to authenticate. If the credentials are not cached, the user is prompted to enter credentials. This option only applies when the user has previously entered credentials. If the infrastructure has implemented a fast reconnect technology such as CCKM (CCX), Fast Session Resume, or PMKID caching then selecting this option will prevent that technology from working properly by prompting the user for credentials when attempting to reconnect.
On Resume	Select this option to cause an authenticated user to be reauthenticated when a suspend/resume occurs. The mobile computer uses the cached credentials to authenticate. Once authenticated, the user is prompted for credentials. If the user does not enter matching credentials within three attempts, the user is disconnected from the network. This option only applies when the user has previously entered credentials. If the infrastructure has implemented a fast reconnect technology such as CCKM (CCX), Fast Session Resume, or PMKID caching then selecting this option will prevent that technology from working properly by prompting the user for credentials when attempting to reconnect.
At Time	Select this option to perform a local verification on an authenticated user at a specified time. The time can be an absolute time or a relative time from the authentication, and should be in at least five minute intervals. Once the time has passed, the user is prompted for credentials. If the user does not enter the same credentials that were entered prior to the At-Time event within three attempts, the user is disconnected from the network. This option only applies when the user has previously entered credentials.

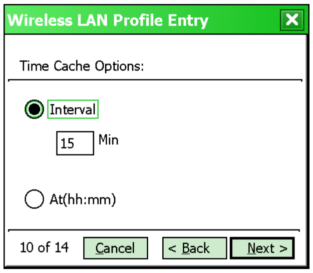
✓ ***NOTE*** Entering credentials applies the credentials to a particular profile. Logging out clears all cached credentials. Editing a profile clears any cached credentials for that profile.

The following authentication types have credential caching:

- EAP-TLS
- PEAP
- LEAP
- TTLS
- EAP-FAST.

Some exceptions to the credential caching rules apply for profiles where the credentials expire, such as EAP-GTC token profiles. Since the token expires after a short period, the user may be prompted for credentials even when credentials have already been entered and cached for that profile.

Selecting the **At Time** check box displays the **Time Cache Options** dialog box.



Time Cache Options:

● Interval

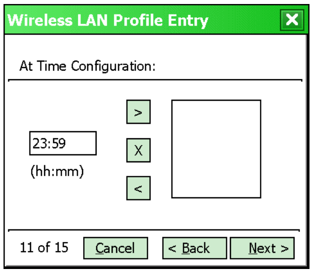
15 Min

○ At(hh:mm)

10 of 14

Figure 4-22 *Time Cache Options Dialog Box*

1. Tap the **Interval** radio button to check credentials at a set time interval.
2. Enter the value in minutes in the **Min** text box.
3. Tap the **At (hh:mm)** radio button to check credentials at a set time.
4. Tap **Next**. The **At Time** dialog box appears.



At Time Configuration:

23:59 (hh:mm)

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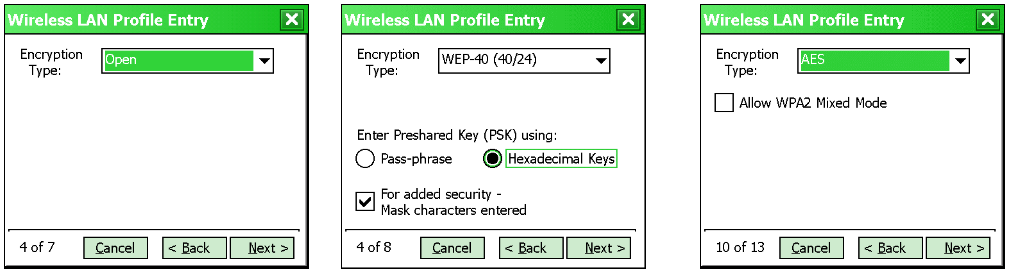
Figure 4-23 *At Time Dialog Box*

5. Enter the time using the 24 hour clock format in the **(hh:mm)** text box.
6. Tap **>** to move the time to the right. Repeat for additional time periods.
7. Tap **Next**. The **Encryption** dialog box displays.

Encryption

✓ ***NOTE*** The only available encryption methods in Ad-hoc mode are Open, WEP-40 and WEP-104.

Use the **Encryption** dialog box to select an encryption method. This page contains the fields to configure the encryption method and corresponding keys, if any. The drop-down list only includes encryption methods available for the selected security mode and authentication type.


Wireless LAN Profile Entry
Cancel
< Back
Next >
Wireless LAN Profile Entry
Cancel
< Back
Next >
Wireless LAN Profile Entry
Cancel
< Back
Next >

Encryption Type: Open

4 of 7

Encryption Type: WEP-40 (40/24)

Enter Preshared Key (PSK) using:

○ Pass-phrase ● Hexadecimal Keys

☑ For added security - Mask characters entered

4 of 8

Encryption Type: AES

□ Allow WPA2 Mixed Mode

10 of 13

Figure 4-24 *Encryption Dialog Box*

Based on the encryption method and the authentication type, the user may have to manually enter pre-shared encryption keys (or a pass phrase). When the user selects any authentication type other than None, 802.1x authentication is used and the keys are automatically generated.

Table 4-11 *Encryption Options*

Encryption	Description
Open	Select **Open** (the default) when no data packet encryption is needed over the network. Selecting this option provides no security for data transmitted over the network.
WEP-40 (40/24)	Select **WEP-40 (40/24)** to use 64-bit key length WEP encryption. This encryption method is only available for the Legacy security mode with Authentication Type set to **None**. Note: This is alternately referred to as WEP-64.
WEP-104 (104/24)	Select **WEP-104 (104/24)** to use a 128-bit key length WEP encryption. If WEP-104 (104/24) is selected, other controls appear that allow you to enter keys. This encryption method is available for the Legacy security mode. Note: This is alternately referred to as WEP-128.
TKIP	Select **TKIP** for the adapter to use the Temporal Key Integrity Protocol (TKIP) encryption method. This encryption method is available for all security modes other than Legacy. When TKIP is selected, mixed mode support is always enabled. This is true for all security modes that allow TKIP as an encryption method. This means that the mobile computer will operate in an environment in which TKIP is used for encrypting the unicast traffic, and either TKIP or WEP-104 is used for encrypting multicast/broadcast traffic. This allows the terminal to operate with an AP that is set up to support both WPA and legacy mobile computers simultaneously.
AES	Select **AES** for the adapter to use the Advanced Encryption Standard (AES) encryption method. This encryption method is available for the WPA2 - Enterprise and WPA2 - Personal security modes. For WPA2 security modes, the Allow WPA2 Mixed Mode checkbox may be selected. If this checkbox is unchecked, the mobile computer will only operate in an environment in which AES is used for encrypting both unicast and multicast/broadcast traffic. Checking this checkbox allows the mobile computer to still use only AES encryption for unicast traffic, but allows it to use either AES, TKIP, or WEP-104 encryption for broadcast traffic. This allows the mobile computer to operate with an AP that is set up to support legacy and/or WPA and WPA2 mobile computers simultaneously. Note that neither WEP-104 nor TKIP is as strong an encryption as AES, so allowing the mobile computer to operate in mixed mode is less secure.

For all Encryption types other than **Open**, if authentication is set to **None**, then the wizard displays additional controls for entering pre-shared keys (see *Figure 4-24 on page 4-17*). This includes **Personal** security modes, which default to authentication **None** and exclude **Enterprise** security modes, which require an authentication type to be specified.

- Select the **Pass-phrase** or **Hexadecimal Keys** radio button to indicate whether a pass-phrase or hexadecimal keys will be entered on the next page.
- Select the **For added security - Mask characters entered** check box to hide characters entered. Deselect this to show characters entered.

Table 4-12 *Encryption / Authentication Matrix*

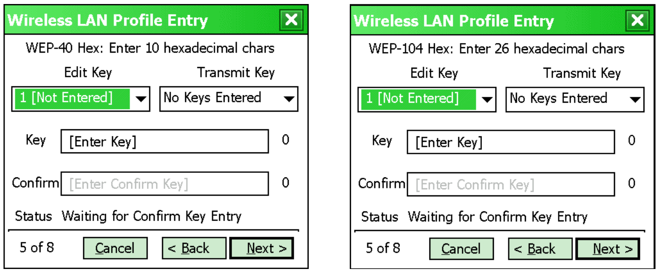
Authentication	Encryption					
	Legacy (Pre-WPA)		WPA Personal	WPA2 Personal	WPA Enterprise	WPA2 Enterprise
	Open	WEP	TKIP	AES or TKIP	TKIP	AES or TKIP
None	Yes	WEP-40 or WEP-104	Yes	Yes		
EAP-TLS		WEP-104			Yes	Yes
EAP-FAST		WEP-104			Yes	Yes
PEAP		WEP-104			Yes	Yes
LEAP		WEP-104			Yes	Yes
TTLS		WEP-104			Yes	Yes

Hexadecimal Keys

To enter the hexadecimal key information select the **Hexadecimal Keys** radio button. An option is provided to hide the characters that are entered for added security. To hide the characters select the **For added security - Mask characters entered** check box.

To enter a hexadecimal key with characters hidden:

1. Select the **For added security - Mask characters entered** check box.
2. Tap **Next**.



Wireless LAN Profile Entry

WEP-40 Hex: Enter 10 hexadecimal chars

Edit Key: 1 [Not Entered]

Transmit Key: No Keys Entered

Key [Enter Key] 0

Confirm [Enter Confirm Key] 0

Status Waiting for Confirm Key Entry

5 of 8

Wireless LAN Profile Entry

WEP-104 Hex: Enter 26 hexadecimal chars

Edit Key: 1 [Not Entered]

Transmit Key: No Keys Entered

Key [Enter Key] 0

Confirm [Enter Confirm Key] 0

Status Waiting for Confirm Key Entry

5 of 8

Figure 4-25 *WEP-40 and WEP-104 WEP Keys Dialog Boxes*

3. For WEP only, in the **Edit Key** drop-down list, select the key to enter.
4. In the **Key** field, enter the key.
   a. For WEP-40 enter 10 hexadecimal characters.
   b. For WEP-104 enter 26 hexadecimal characters.
   c. For TKIP enter 64 hexadecimal characters.
   d. For AES enter 64 hexadecimal characters.
5. In the **Confirm** field, re-enter the key. When the keys match, a message appears indicating that the keys match.

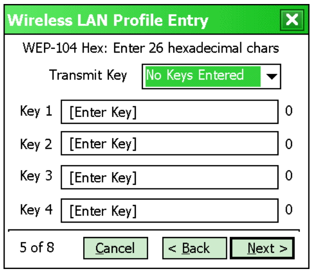
6. Repeat for each WEP key.

7. For WEP only, in the **Transmit Key** drop-down list, select the key to transmit.

8. Tap **Next**. The **IPv4 Address Entry** dialog box displays.

To enter a hexadecimal key without characters hidden:

1. Tap **Next**.



Wireless LAN Profile Entry

WEP-104 Hex: Enter 26 hexadecimal chars

Transmit Key: No Keys Entered

Key 1 [Enter Key] 0

Key 2 [Enter Key] 0

Key 3 [Enter Key] 0

Key 4 [Enter Key] 0

Figure 4-26 *WEP-40 and WEP-104 WEP Keys Dialog Boxes*

2. For WEP only, in each **Key** field, enter the key.
   a. For WEP-40 enter 10 hexadecimal characters.
   b. For WEP-104 enter 26 hexadecimal characters.
   c. For TKIP enter 64 hexadecimal characters.
   d. For AES enter 64 hexadecimal characters.

3. For WEP only, in the **Transmit Key** drop-down list, select the key to transmit.

4. Tap **Next**. The **IPv4 Address Entry** dialog box displays.

Pass-phrase Dialog

When selecting **None** as an authentication and **WEP** as an encryption, choose to enter a pass-phrase by checking the **Pass-phrase** radio button. The user is prompted to enter the pass-phrase. For WEP, the **Pass-phrase** radio button is only available if the authentication is **None***.*

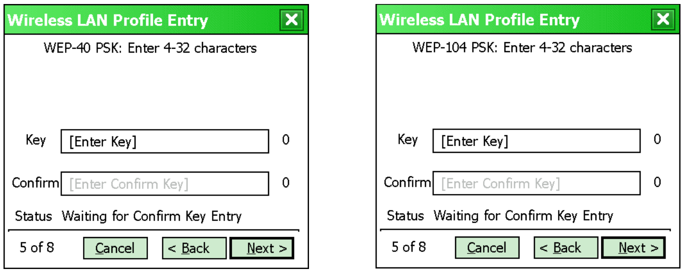
When selecting **None** as an authentication and **TKIP** as an encryption, the user must enter a pass-phrase. The user cannot enter a pass-phrase if the encryption is **TKIP** and the authentication is anything other than **None**.

When selecting **None** as an authentication and **AES** as an encryption, the user must enter a pass-phrase. The user cannot enter a pass-phrase if the encryption is **AES** and the authentication is anything other than **None.**

To enter a pass-phrase with characters hidden:

1. Select the **For added security - Mask characters entered** check box.

2. Tap **Next**.


Wireless LAN Profile Entry

WEP-40 PSK: Enter 4-32 characters

Key [Enter Key] 0

Confirm [Enter Confirm Key] 0

Status Waiting for Confirm Key Entry

5 of 8

Wireless LAN Profile Entry

WEP-104 PSK: Enter 4-32 characters

Key [Enter Key] 0

Confirm [Enter Confirm Key] 0

Status Waiting for Confirm Key Entry

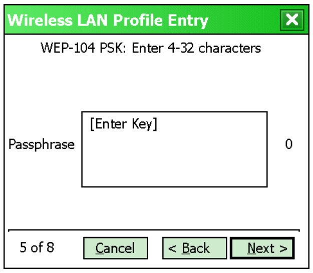
5 of 8

Figure 4-27 *WEP-40 and WEP-104 WEP Keys Dialog Boxes*

3. In the **Key** field, enter the key.
   a. For WEP-40 enter between 4 and 32 characters.
   b. For WEP-104 enter between 4 and 32 characters.
   c. For TKIP enter between 8 and 63 characters.
   d. For AES enter between 8 and 63 characters.
4. In the **Confirm** field, re-enter the key. When the keys match, a message appears indicating that the keys match.
5. Tap **Next**. The **IPv4 Address Entry** dialog box displays.

To enter a pass-phrase key without characters hidden:

1. Tap **Next**.


Wireless LAN Profile Entry

WEP-104 PSK: Enter 4-32 characters

Passphrase [Enter Key] 0

5 of 8

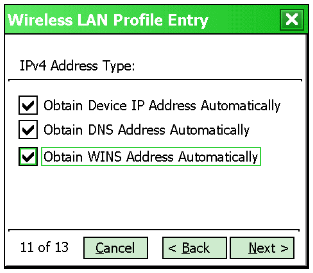
Figure 4-28 *WEP-40 and WEP-104 WEP Keys Dialog Boxes*

2. In the **Key** field, enter the key.
   a. For WEP-40 enter between 4 and 32 characters.
   b. For WEP-104 enter between 4 and 32 characters.
   c. For TKIP enter between 8 and 63 characters.
   d. For AES enter between 8 and 63 characters.

Tap **Next**. The **IPv4 Address Entry** dialog box displays.

IPv4 Address Entry

Use the **IPv4 Address Entry** dialog box to configure network address parameters: IP address, subnet mask, gateway, DNS, and WINS.


Wireless LAN Profile Entry

IPv4 Address Type:

☑ Obtain Device IP Address Automatically
☑ Obtain DNS Address Automatically
☑ Obtain WINS Address Automatically

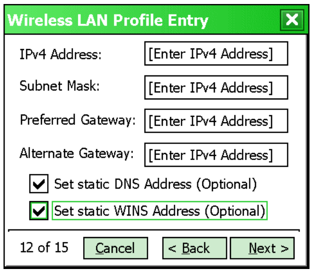
Figure 4-29 *IPv4 Address Entry Dialog Box*

Table 4-13 *IPv4 Address Entry*

Field	Description
Obtain Device IP Address Automatically	Check to obtain a leased IP address and network configuration information from a remote server. This setting is checked by default in the mobile computer profile. Uncheck to manually assign IP, subnet mask and default gateway addresses the mobile computer profile uses. Ad-hoc mode does not support DHCP. Use only Static IP address assignment.
Obtain DNS Address Automatically	Check to use DNS server addresses obtained from a remote server. This setting is checked by default in the mobile computer profile. Uncheck to manually assign DNS server addresses. Ad-hoc mode does not support DHCP. Use only Static IP address assignment.
Obtain WINS Address Automatically	Check to use WINS server addresses obtained from a remote server. This setting is checked by default in the mobile computer profile. Uncheck to manually assign WINS server addresses. Ad-hoc mode does not support DHCP. Use only Static IP address assignment.

Select all three check boxes to automatically obtain addresses from a remote server. Tap **Next**. The **Transmit Power** dialog box displays.

Uncheck the **Obtain Device IP Address Automatically** to manually assign IP, subnet mask and default gateway addresses the mobile computer profile uses. Tap **Next**. The **Static IP Address** dialog box appears.


Wireless LAN Profile Entry

IPv4 Address: [Enter IPv4 Address]
Subnet Mask: [Enter IPv4 Address]
Preferred Gateway: [Enter IPv4 Address]
Alternate Gateway: [Enter IPv4 Address]

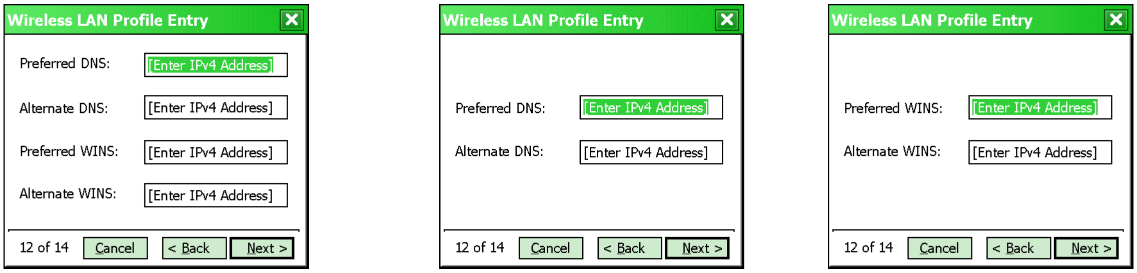
☑ Set static DNS Address (Optional)
☑ Set static WINS Address (Optional)

Figure 4-30 *Static IP Address Entry Dialog Box*

Table 4-14 *Static IP Address Entry Fields*

Field	Description
IPv4 Address	The Internet is a collection of networks with users that communicate with each other. Each communication carries the address of the source and destination networks and the particular machine within the network associated with the user or host computer at each end. This address is called the IP address (Internet Protocol address). Each node on the IP network must be assigned a unique IP address that is made up of a network identifier and a host identifier. Enter the IP address as a dotted-decimal notation with the decimal value of each octet separated by a period, for example, 192.168.7.27.
Subnet Mask	Most TCP/IP networks use subnets to manage routed IP addresses. All IP addresses have a network part and a host part. The network part specifies a physical network. The host part specifies a host on that physical network. The subnet mask allows a network administrator to use some of the bits that are normally used to specify the host to instead specify physical sub-networks within an organization. This helps organize and simplify routing between physical networks.
Gateway	The default gateway forwards IP packets to and from a remote destination.
Set Static DNS Address (Optional)	Check to manually assign DNS server addresses.
Set Static WINS Address (Optional)	Check to manually assign WINS server addresses.

Select the **Set Static DNS Address** or **Set static WINS address** check box, then tap **Next** to display the **DNS/WINS Address Entry** dialog box. Enter the DNS and/or WINS addresses here. Tap **Next** without selecting the **Set Static DNS Address** or **Set static WINS Address** check box to display the **Transmit Power** dialog box.



Wireless LAN Profile Entry

Preferred DNS: [Enter IPv4 Address]

Alternate DNS: [Enter IPv4 Address]

Preferred WINS: [Enter IPv4 Address]

Alternate WINS: [Enter IPv4 Address]

Static DNS Address and **Set static WINS Address** checkboxes selected

Wireless LAN Profile Entry

Preferred DNS: [Enter IPv4 Address]

Alternate DNS: [Enter IPv4 Address]

Only Static DNS Address checkbox selected

Wireless LAN Profile Entry

Preferred WINS: [Enter IPv4 Address]

Alternate WINS: [Enter IPv4 Address]

Only Static WINS Address checkbox selected

Figure 4-31 *DNS/WINS Address Entry Dialog Box*

The IP information entered in the profile is only used if the **Enable IPv4 Mgmt** check box in the **Options** > **System Options** dialog box was selected (*System Options on page 7-3*). If not selected, the IP information in the profile is ignored and the IP information entered in the Microsoft interface applies.

Table 4-15 *DNS/WINS Address Entry Fields*

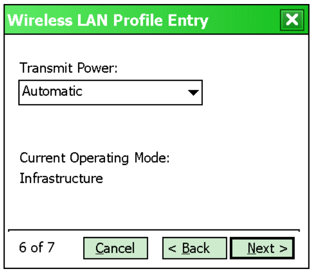
Field	Description
DNS	The Domain Name System (DNS) is a distributed Internet directory service. DNS translates domain names and IP addresses, and controls Internet email delivery. Most Internet services require DNS to operate properly. If DNS is not configured, Web sites cannot be located and/or email delivery fails. The Alternate DNS server address will be used if the Preferred DNS server is unavailable.
WINS	WINS is a Microsoft® Net BIOS name server. WINS eliminates the broadcasts needed to resolve computer names to IP addresses by providing a cache or database of translations. The Alternate WINS server address will be used if the Preferred WINS server is unavailable.

Tap **Next**. The **Transmit Power** dialog box displays.

Transmit Power

The **Transmit Power** drop-down list contains different options for Ad-hoc and Infrastructure mode. Automatic (i.e., use the current AP settings) and Power Plus (use higher than the current AP settings) are available for **Infrastructure** mode.

Adjusting the radio transmission power level enables the user to expand or confine the transmission coverage area. Reducing the radio transmission power level reduces potential interference to other wireless devices that might be operating nearby. Increasing the radio transmission power level increases the range at which other wireless devices can “hear” the radio's signal.



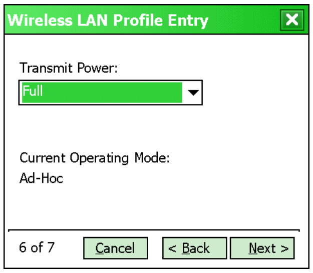
Transmit Power:
Automatic

Current Operating Mode:
Infrastructure

Figure 4-32 *Transmit Power Dialog Box (Infrastructure Mode)*

Table 4-16 *Transmit Power Dialog Box (Infrastructure Mode)*

Field	Description
Automatic	Select **Automatic** (the default) to use the AP specified power level.
Power Plus	Select **Power Plus** to set the mobile computer transmission power one level higher than the level set for the AP. The power level is set to conform to regulatory requirements.



Wireless LAN Profile Entry

Transmit Power:
Full

Current Operating Mode:
Ad-Hoc

6 of 7

Figure 4-33 *Transmit Power Dialog Box (Ad-hoc Mode)*

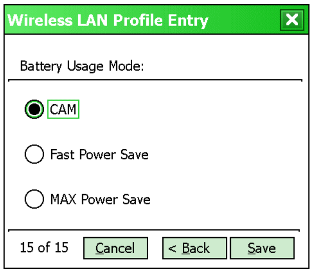
Table 4-17 *Power Transmit Options (Ad-hoc Mode)*

Field	Description
Full	Select **Full** power for the highest transmission power level. Select **Full** power when operating in highly reflective environments and areas where other devices could be operating nearby, or when attempting to communicate with devices at the outer edge of a coverage area.
30 mW	Select **30 mW** to set the maximum transmit power level to 30 mW. The radio transmits at the minimum power required.
15 mW	Select **15 mW** to set the maximum transmit power level to 15 mW. The radio transmits at the minimum power required.
5 mW	Select **5 mW** to set the maximum transmit power level to 5 mW. The radio transmits at the minimum power required.
1 mW	Select **1 mW** for the lowest transmission power level. Use this level when communicating with other devices in very close proximity, or in instances where little or no radio interference from other devices is expected.

Tap **Next** to display the **Battery Usage** dialog box.

Battery Usage

Use the **Battery Usage** dialog box to select power consumption of the wireless LAN. There are three settings available: CAM, Fast Power Save, and MAX Power Save. Battery usage cannot be configured in Ad-hoc profiles.



Wireless LAN Profile Entry

Battery Usage Mode:

● CAM

○ Fast Power Save

○ MAX Power Save

15 of 15

Figure 4-34 *Battery Usage Dialog Box*

✓ ***NOTE*** Power consumption is also related to the transmit power settings.

Table 4-18 *Battery Usage Options*

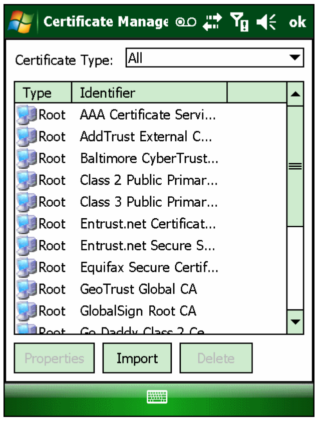
Field	Description
CAM	Continuous Aware Mode (**CAM**) provides the best network performance, but yields the shortest battery life.
Fast Power Save	**Fast Power Save** (the default) yields much better battery life than CAM, but with some degradation in network performance.
MAX Power Save	**Max Power Save** yields the longest battery life, but with potentially more degradation in network performance. However, in networks with minimal latency, **MAX Power Save** can yield the same network performance as **Fast Power Save**.

When the AP that the mobile computer associates to is configured to use WMM Power Save mode, the mobile computer will ignore the Battery Usage Mode setting – assuming it’s not set to CAM – and will use the WMM protocol instead. While the use of WMM Power Save mode can maximize battery life, it can also decrease network performance. If network performance Is unacceptably slow, you can disable the use of WMM Power Save by manually changing values in the registry. See *WMM UAPSD on page 12-2* for more information.

Chapter 5 Manage Certificates Application

Introduction

Users can view and manage security certificates in the various certificate stores. Tap the **Signal Strength** icon > **Manage Certs**. The **Certificate Manager** window displays.

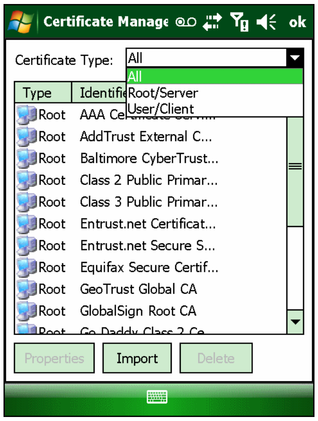


Certificate Type: All

Type	Identifier
Root	AAA Certificate Servi...
Root	AddTrust External C...
Root	Baltimore CyberTrust...
Root	Class 2 Public Primar...
Root	Class 3 Public Primar...
Root	Entrust.net Certificat...
Root	Entrust.net Secure S...
Root	Equifax Secure Certif...
Root	GeoTrust Global CA
Root	GlobalSign Root CA
Root	Go Daddy Class 2 Ce...

Figure 5-1 *Certificate Manager Window*

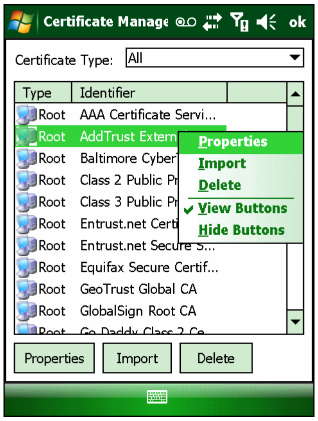
Various certificate types display at one time. Select the **Certificate Type** drop-down box to filter the certificate list to display **All**, only **Root/Server**, or only **User/Client** certificates.



Type	Identifie
Root	AAA Ce
Root	AddTrust External C...
Root	Baltimore CyberTrust...
Root	Class 2 Public Primar...
Root	Class 3 Public Primar...
Root	Entrust.net Certificat...
Root	Entrust.net Secure S...
Root	Equifax Secure Certif...
Root	GeoTrust Global CA
Root	GlobalSign Root CA
Root	Go Daddy Class 2 Ce

Figure 5-2 *Certificate Type Options*

The **Certificate Manager** window contains command buttons at the bottom of the window. A button might be disabled (gray) if the operation cannot be performed based on any selected object.



Type	Identifier
Root	AAA Certificate Servi...
Root	AddTrust Extern
Root	Baltimore Cyber
Root	Class 2 Public Pr
Root	Class 3 Public Pr
Root	Entrust.net Certi
Root	Entrust.net Secure S...
Root	Equifax Secure Certif...
Root	GeoTrust Global CA
Root	GlobalSign Root CA
Root	Go Daddy Class 2 Ce

Figure 5-3 *Command Buttons and Context Menu*

These buttons can be hidden to allow more space for displaying the list of certificates. To hide the buttons tap-and-hold and/or double-tap the stylus in the list area depending on the mobile computer. It can also be brought up by pressing the Enter key on the keyboard. The pop-up menu appears.

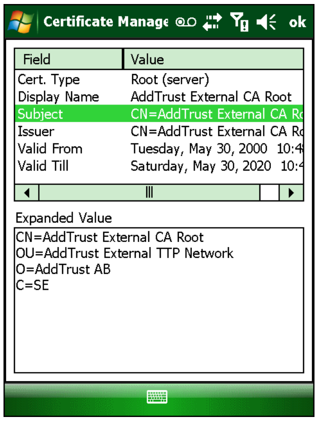
Select **Hide Buttons** to hide the command buttons.

To display the buttons select **View Buttons** from the pop-up menu.

The pop-up menu also allows the user to select the **Properties**, **Import**, and **Delete** commands.

Certificate Properties

To display the detailed properties of a certificate, select a certificate in the list and tap the **Properties** button. The window display the properties of the certificate. Select a property in the upper list and the detailed information displays in the **Expanded Value** section.



Field	Value
Cert. Type	Root (server)
Display Name	AddTrust External CA Root
Subject	CN=AddTrust External CA Ro
Issuer	CN=AddTrust External CA Ro
Valid From	Tuesday, May 30, 2000 10:4
Valid Till	Saturday, May 30, 2020 10:4

Expanded Value

CN=AddTrust External CA Root
OU=AddTrust External TTP Network
O=AddTrust AB
C=SE

Figure 5-4 *Certificate Properties Window*

Tap **ok**, **Escape**, or **X** button to exit (depending on the mobile computer).

Import a Certificate

Import certificates from either files or from a server machine:

- .CER file - DER encrypted Root/Server certificates.

✓ ***NOTE*** In order to validate a server certificate for an Intermediate CA during authentication, it is only necessary to import the certificate from the associated Root CA and then specify the Root CA in the profile.

- .PFX file - Personal inFormation eXchange formatted file containing one or more Root/Server and/or User/Client Certificates. These files are usually protected by a password, so a password will be prompted for. If there is no password, enter nothing and select the **OK** button.
- Server - User/Client certificates can be requested directly from a Certificate Authority (CA) on the network. A User name, Password (optional), and the Server (an IP address) must be provided to obtain a certificate for the User from the CA.

✓ ***NOTE*** It is possible to import and successfully use a user certificate issued by an Intermediate CA; however, this may require additional infrastructure setup. For example, it may be necessary to supply the RADIUS server with certificates for both the Intermediate CA and for the Root CA. Infrastructure setup is beyond the scope of this guide.

Tap the **Import** button or select from the context menu. The **Import Certificate** dialog box displays.

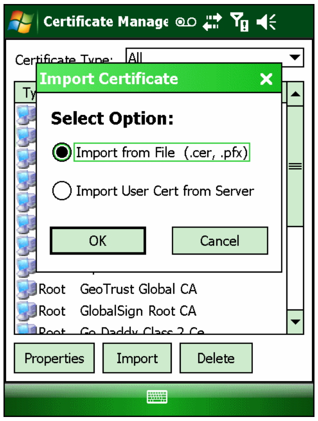


Figure 5-5 *Import Certificate Dialog Box*

Select the **Import from File (.cer, .pfx)** radio button to import a certificate file. The **Open** window displays.

Select the file to import.

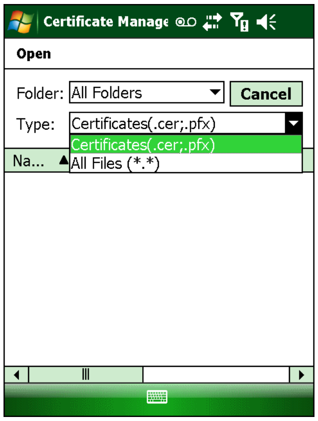
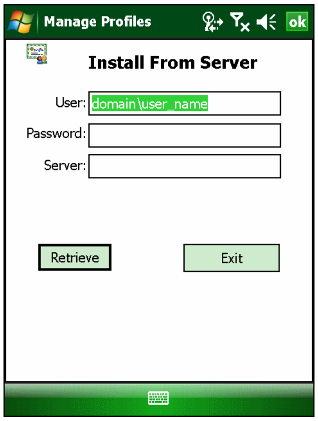


Figure 5-6 *Certificate Manage Window - Import from File*

Select the **Import User Cert from Server** radio button to import a certificate from a server. The **Install From Server** window displays.

Enter the user, password, and server information in the respective text boxes.

Tap the **Retrieve** button to import the certificate.



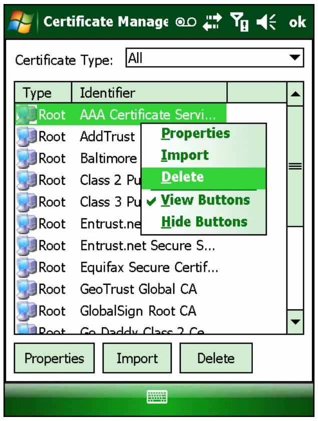
User: domain\user_name

Figure 5-7 *Install From Server*

Delete a Certificate

To delete a certificates:

Select the certificate to delete.



Certificate Type: All

Type	Identifier
Root	AAA Certificate Servi...
Root	AddTrust
Root	Baltimore
Root	Class 2 Pu
Root	Class 3 Pu
Root	Entrust.ne
Root	Entrust.net Secure S...
Root	Equifax Secure Certif...
Root	GeoTrust Global CA
Root	GlobalSign Root CA
Root	Go Daddy Class 2 Ce

Figure 5-8 *Certificate Dialog Box - Delete Certificate*

Tap the **Delete** button or select **Delete** from the pop-up menu.

Chapter 6 Manage PACs Application

Introduction

Users can view and manage Protected Access Credentials (PACs) used by Cisco's EAP-FAST authentication protocol. Tap the **Signal Strength** icon > **Manage PACs**. The **PAC Manager** window displays.

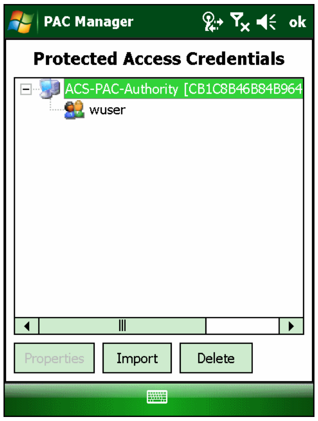

PAC Manager
ok
Protected Access Credentials
ACS-PAC-Authority [CB1C8B46B84B964
wuser
Properties
Import
Delete

Figure 6-1 *PAC Manager Window*

PACs are uniquely identified by referencing a PAC Authority Identifier (A-ID) (the server that issued the PAC) and by the individual user identifier (I-ID). The PACs display sorted by A-ID (default) or by I-ID in a tree display.

The **PAC Manager** window contains buttons at the bottom of the window. A button might be disabled (gray) if the operation cannot be performed based on any selected object.

These buttons can be hidden to allow more space for displaying the list of certificates. To hide the buttons tap-and-hold and/or double-tap the stylus in the list area depending on the mobile computer.

Select **Hide Buttons** to hide the buttons.

To display the buttons select **View Buttons** from the pop-up menu.

The pop-up menu also allows the user to select the **Properties, Import** and **Delete** commands.

You can always sort by A-ID, sort by I-ID, view buttons and hide buttons in the pop-up menu.

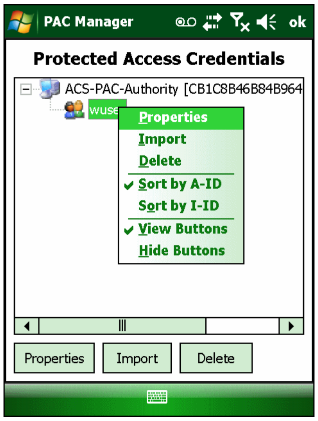
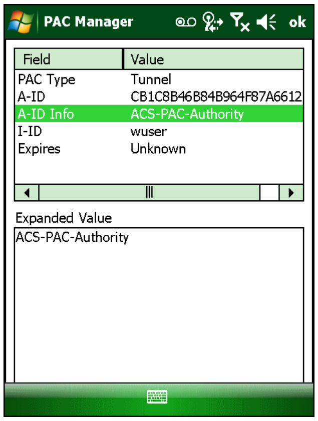


Figure 6-2 *Command Buttons and Context Menu*

PAC Properties

Display the detailed properties of a PAC by selecting an item in a sub-tree, and selecting the **Properties** button or pop-up menu. The following Window appears with the list of properties in the upper portion of the window. By selecting an entry in the upper list, the expanded details of the entry property display in the lower list of the window.



Field	Value
PAC Type	Tunnel
A-ID	CB1C8B46B84B964F87A6612
A-ID Info	ACS-PAC-Authority
I-ID	wuser
Expires	Unknown

Expanded Value

ACS-PAC-Authority

Figure 6-3 *PAC Properties Popup*

To return to the main page, tap the **Ok** button, **Escape**, or **X** button depending on the mobile computer.

Delete PAC

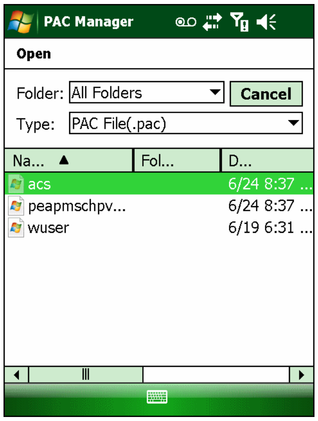
To delete a single PAC, tap a leaf item (right most tree item) to select the PAC, then select the **Delete** button or pop-up menu. A confirmation dialog box appears.

To delete a group of PACs having the same A-ID or same I-ID, sort the PACs by desired ID type, then tap on the parent item (left most tree item) to select the group. Select the **Delete** button or pop-up menu and a confirmation dialog box appears.

Import PAC

Usually PACs are automatically provisioned to the mobile computer over the air the first time EAP-FAST authentication occurs. For increased security, an administrator may choose to manually provision the mobile computer with a PAC instead. In this case, the administrator must generate an appropriate PAC file manually using commands on the PAC Authority. Once the PAC file is generated, it must be manually transferred to the mobile computer's file system before it can be imported by the Manage PACs application.

To import a PAC, tap the **Import** button. A dialog displays asking you to select the PAC file to be imported.



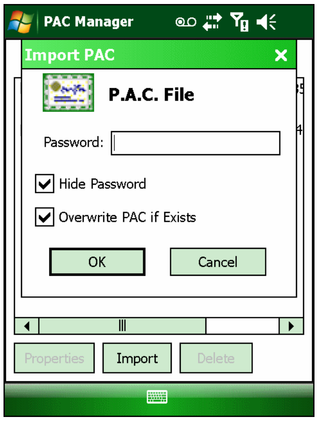
Folder: All Folders

Type: PAC File(.pac)

Na...	D...
acs	6/24 8:37 ...
peapmschpv...	6/24 8:37 ...
wuser	6/19 6:31 ...

Figure 6-4 *Open Window*

Navigate to the file to be imported and choose it. The **Import PAC** dialog displays.



Password:

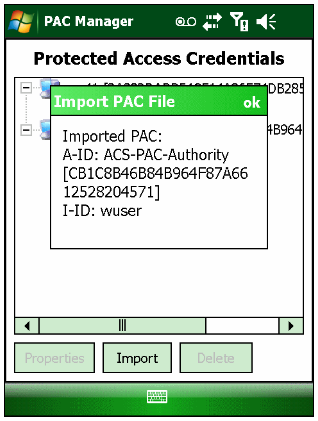
☑ Hide Password

☑ Overwrite PAC if Exists

Figure 6-5 *Import PAC Dialog Box*

If the PAC file is password protected, enter the password in the **Password** field. If you uncheck the **Hide Password** checkbox, the password will be displayed in clear text as you type it. To hide the password as you type it, leave the **Hide Password** checkbox checked. If you wish to overwrite any existing PAC in the Fusion PAC Store without being prompted for verification, check the **Overwrite PAC if Exists** checkbox. Tap the **Ok** button to import the PAC. Tap the **Cancel** button to abort the import operation.

If you have tapped **Ok** and the PAC already exists in the PAC Store, a verification dialog box may appear. Tap **Yes** to continue the import operation or tap **No** to abort the operation. If you have tapped **Yes**, an informational dialog box appears listing the attributes (A-ID and I-ID) of the imported PAC.



Imported PAC:
A-ID: ACS-PAC-Authority
[CB1C8B46B84B964F87A66
12528204571]
I-ID: wuser

Figure 6-6 *Import PAC File Dialog Box*

Tap **ok** to close the dialog box. You will be returned to the main **PAC Manager** window with the tree list of PACs. The newly-imported PAC should appear in the list.

Chapter 7 Options

Introduction

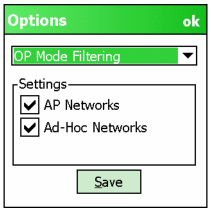
Use the wireless **Option** dialog box to select one of the following operation options from the drop-down list:

- Op Mode Filtering
- Regulatory
- Band Selection
- System Options
- Auto PAC Settings
- IPv6
- Change Password
- Export.

Change the option settings as you desire and then tap SAVE to save your changes. Until you tap the SAVE button, no changes are saved. To close the dialog, tap ok. If you tap ok and you have made changes without saving them, a dialog will display asking if you want to quit without saving.

Op (Operating) Mode Filtering

The **Op Mode Filtering** options cause the **Find WLANs** application to filter the available networks found.



☑ AP Networks
☑ Ad-Hoc Networks

Figure 7-1 *OP Mode Filtering Dialog Box*

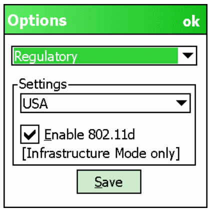
The **AP Networks** and **Ad-Hoc Networks** check boxes are selected by default.

Table 7-1 *OP Mode Filtering Options*

Field	Description
AP Networks	Select the **AP Networks** check box to display available AP networks and their signal strength within the **Available WLAN Networks** (see *Chapter 2, Find WLAN Application*). These are the APs in the vicinity available to the mobile computer for association. If this option was previously disabled, refresh the **Available WLAN Networks** window to display the AP networks available to the mobile computer.
AD-Hoc Networks	Select the **Ad-Hoc Networks** check box to display available peer (adapter) networks and their signal strength within the **Available WLAN Networks**. These are peer networks in the vicinity that are available to the mobile computer for association. If this option was previously disabled, refresh the **Available WLAN Networks** window to display the Ad Hoc networks available to the mobile computer.

Regulatory Options

Use the **Regulatory** settings to configure the country the mobile computer is in. Due to regulatory requirements (within a country) a mobile computer is only allowed to use certain channels.



Settings: USA

☑ Enable 802.11d [Infrastructure Mode only]

Figure 7-2 *Regulatory Options Dialog Box*

Table 7-2 *Regulatory Options*

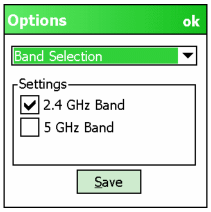
Field	Description
Settings	Select a country from the drop-down list. If the **Enable 802.11d** check box is not selected, a profile's country selection must match this setting in order to connect to that profile.
Enable 802.11d	If the **Enable 802.11d** check box is selected, the WLAN adapter follows the 802.11d standard. It passively scans until valid country information is received from an AP. It limits transmit power settings based on maximums received from the AP. Profiles which use Infrastructure mode can only connect if the country selected in the profile matches the AP country setting, or if the profile country setting is **Allow Any Country**. Profiles which use Ad-hoc mode are not 802.11d compliant.

Band Selection

The **Band Selection** settings identify the frequency bands to scan when finding WLANs. These values refer to the 802.11 standard networks.

✓ ***NOTE*** Select one band for faster access when scanning for WLANs.

Not all mobile devices support both 2.4 GHz and 5 GHz bands.



Options ok

Band Selection

Settings

☑ 2.4 GHz Band

□ 5 GHz Band

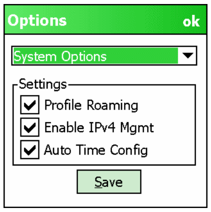
Figure 7-3 *Band Selection Dialog Box*

Table 7-3 *Band Selection Options*

Field	Description
2.4GHz Band	The **Find WLANs** application list includes all networks found in the 2.4 GHz band (802.11b and 802.11g).
5GHz Band	The **Find WLANs** application list includes all networks found in the 5 GHz band (802.11a).

System Options

Use **System Options** to set miscellaneous system setting.



Options ok

System Options

Settings

☑ Profile Roaming

☑ Enable IPv4 Mgmt

☑ Auto Time Config

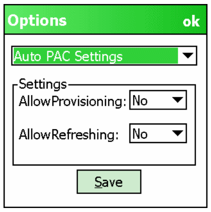
Figure 7-4 *System Options Dialog Box*

Table 7-4 *System Options*

Field	Description
Profile Roaming	Configures the mobile computer to roam to the next available WLAN profile when it moves out of range of the current WLAN profile.
Enable IPv4 Mgmt	Enables the Wireless Companion Services to handle IPv4 address management. The Wireless Companion Service configures the IP based on what is configured in the network profile. Deselect this to manually configure the IP in the standard Windows IP window. Enabled by default.
Auto Time Config	Enables automatic update of the system time. Network association updates the device time based on the time set in the AP. This proprietary feature is only supported with Motorola infrastructure. Enabled by default.

Auto PAC Settings

Use the **Auto PAC Settings** to configure whether to allow automatic PAC provisioning and automatic PAC refreshing when using the EAP-FAST authentication protocol.



Auto PAC Settings

Settings

AllowProvisioning: No

AllowRefreshing: No

Figure 7-5 *Auto PAC Settings Dialog Box*

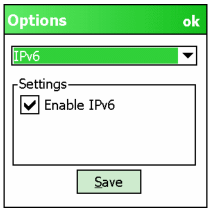
Table 7-5 *Auto PAC Settings*

Field	Description
AllowProvisioning	Select **Yes** from the drop down list to allow the mobile computer to be automatically provisioned with a PAC when using the EAP-FAST authentication protocol. Select **No** to disallow automatic PAC provisioning.
AllowRefreshing	Select **Yes** from the drop down list to allow an existing PAC on the mobile computer to be automatically refreshed when using the EAP-FAST authentication protocol. Select **No** to disallow automatic PAC refreshing.

If the master key on the PAC Authority has expired then the PAC on the mobile computer that was generated with this expired key will have to be manually deleted and a new PAC provisioned even when **AllowRefreshing** is set to **Yes**.

IPv6

Use the **IPv6** options to enable or disable IPv6 for WLAN.



☑ Enable IPv6

Figure 7-6 *IPv6 Options Dialog Box*

Table 7-6 *IPv6 Options*

Enable IPv6	Select the **Enable IPv6** check box to enable IPv6 for WLAN. IPv6 is disabled by default.

Change Password

Use **Change Password** to require that a user enter a password before being allowed to access certain Fusion functions. The functions that are password protected include:

- Find WLANs
- Manage Profiles
- Manage Certs
- Manage PACs
- Options.

Having a password prohibits an un-trusted user from, for example, creating or editing a profile or changing the **Options**. This allows pre-configuring profiles and prevents users from changing the network settings. The user can use this feature to protect settings from a guest user. By default, the password is not set.

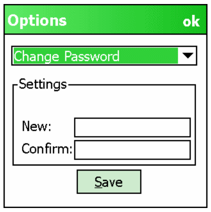


Figure 7-7 *Change Password Window*

Enter the current password in the **Current** text box. If there is no current password, the **Current** text box is not displayed. Enter the new password in the **New** and **Confirm** text boxes. Tap **Save**.

To change an existing password, enter the current password in the **Current** text box and enter the new password in the **New:** and **Confirm:** text boxes. Tap **Save**.

To delete the password, enter the current password in the **Current:** text box and leave the **New:** and **Confirm:** text boxes empty. Tap **Save.**

✓ ***NOTE*** Passwords are case sensitive and can not exceed 63 characters.

Export

✓ ***NOTE*** For Windows CE devices, exporting options enables settings to persists after cold boot. For Windows Mobile devices, exporting options enables settings to persists after clean boot. See *Chapter 11, Persistence* for more information.

Use **Export** to export all profiles to a registry file, and to export the options to a registry file.

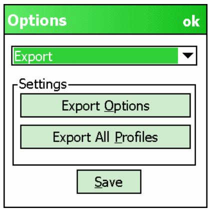
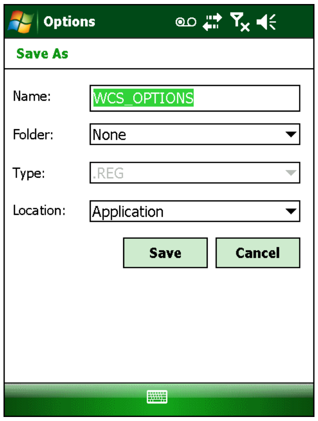


Figure 7-8 *Options - Export Dialog Box*

To export options:

1. Tap **Export Options**. The **Save As** dialog box displays.



Name: WCS_OPTIONS
Folder: None
Type: .REG
Location: Application

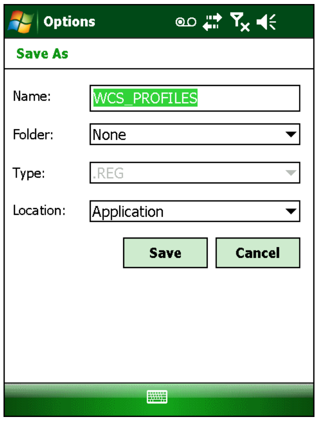
Figure 7-9 *Export Options Save As Dialog Box*

2. Enter a filename in the **Name:** field. The default filename is WCS_OPTIONS.REG.
3. Select the desired folder.
4. Tap **Save**.

To export all profiles:

✓ ***NOTE*** To export only one profile, see *Export a Profile on page 3-4* for more information.

1. Tap **Export All Profiles**. The **Save As** dialog box displays.



Name: WCS_PROFILES

Folder: None

Type: .REG

Location: Application

Figure 7-10 *Export All Profiles Save As Dialog Box*

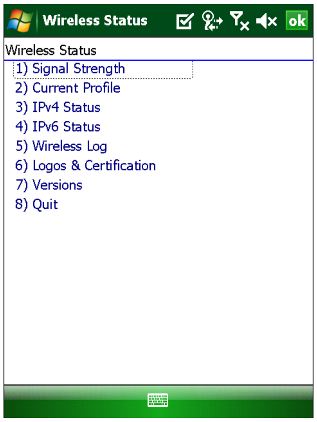
2. Enter a filename in the **Name:** field. The default filename is WCS_PROFILES.REG.
3. In the **Folder:** drop-down list, select the desired folder.
4. Tap **Save**.

Selecting **Export All Profiles** also saves an indication of the current profile. This information is used to determine which profile to connect with after a warm boot or cold boot.

Chapter 8 Wireless Status Application

Introduction

To open the **Wireless Status** window, tap the **Signal Strength** icon > **Wireless Status**. The **Wireless Status** window displays information about the wireless connection.



Wireless Status

1) Signal Strength
2) Current Profile
3) IPv4 Status
4) IPv6 Status
5) Wireless Log
6) Logos & Certification
7) Versions
8) Quit

Figure 8-1 *Wireless Status Window*

The **Wireless Status** window contains the following options. Tap the option to display the option window.

- Signal Strength - provides information about the connection status of the current wireless profile.
- Current Profile - displays basic information about the current profile and connection settings.
- IPv4 Status - displays the current IP address, subnet, and other IP related information assigned to the mobile computer.
- IPv6 Status – displays IPv6 status and IPv6 related information assigned to the WLAN interface of the mobile computer.
- Wireless Log - displays a log of important recent activity, such as authentication, association, and DHCP renewal completion, in time order.
- Logos & Certification – Displays logos and certificates
- Versions - displays software, firmware, and hardware version numbers.

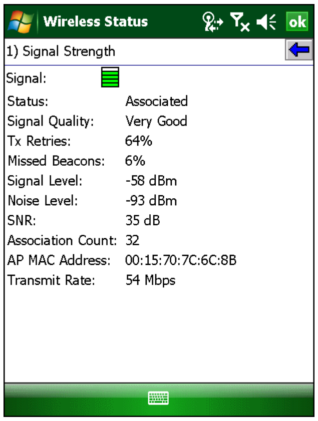
- Quit - exits the **Wireless Status** window.

Each option window contains a back button ⬅ to return to the main **Wireless Status** window.

Signal Strength Window

The **Signal Strength** window provides information about the connection status of the current wireless profile including signal quality, missed beacons, and other statistics described below. The BSSID address (shown as *AP MAC Address*) displays the AP currently associated with the connection. In Ad-hoc mode, the AP MAC Address shows the BSSID of the Ad-hoc network. Information in this window updates every 2 seconds.

To open the **Signal Status** window, tap **Signal Strength** in the **Wireless Status** window.



Signal: 🟩
Status: Associated
Signal Quality: Very Good
Tx Retries: 64%
Missed Beacons: 6%
Signal Level: -58 dBm
Noise Level: -93 dBm
SNR: 35 dB
Association Count: 32
AP MAC Address: 00:15:70:7C:6C:8B
Transmit Rate: 54 Mbps

Figure 8-2 *Signal Strength Window*

After viewing the **Signal Strength** window, tap the back button to return to the **Wireless Status** window.

Table 8-1 *Signal Strength Status*

Field	Description
Signal	Displays the Relative Signal Strength Indicator (RSSI) of the signal transmitted between the AP and mobile computer. As long as the Signal Quality icon is green, the AP association is not jeopardized. If the icon is red (poor signal), an association with a different AP could be warranted to improve the signal. The signal strength icon changes depending on the signal strength.
	🟩 Excellent Signal
	🟩 Very Good Signal
	🟨 Good Signal
	🟨 Fair Signal
	🟥 Poor Signal
	☒ Out of Range (no signal)
	☒ The radio card is off or there is a problem communicating with the radio card.
Status	Indicates if the mobile computer is associated with the AP.
Signal Quality	Displays a text format of the Signal icon.

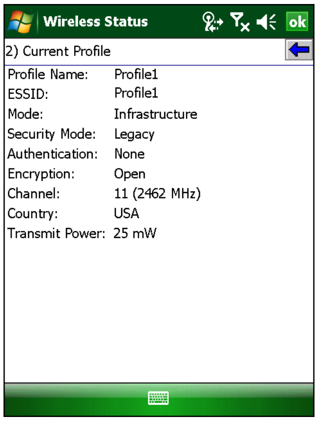
Table 8-1 *Signal Strength Status (Continued)*

Field	Description
Tx Retries	Displays a percentage of the number of data packets the mobile computer retransmits. The fewer transmit retries, the more efficient the wireless network is.
Missed Beacons	Displays a percentage of the amount of beacons the mobile computer missed. The fewer missed beacons, the more efficient the wireless network is. Beacons are uniform system packets broadcast by the AP to keep the network synchronized.
Signal Level	The AP signal level in decibels per milliwatt (dBm).
Noise Level	The background interference (noise) level in decibels per milliwatt (dBm).
SNR	The access point/mobile computer Signal to Noise Ratio (SNR) of signal strength to noise (interference) in decibels per milliwatt (dBm).
Association Count	Displays the number of times the mobile computer has roamed from one AP to another.
AP MAC Address	Displays the MAC address of the AP to which the mobile computer is connected.
Transmit Rate	Displays the current rate of the data transmission.

Current Profile Window

The **Current Profile** window displays basic information about the current profile and connection settings. This window updates every two seconds.

To open the **Current Profile** window, tap **Current Profile** in the **Wireless Status** window.



Profile Name:	Profile1
ESSID:	Profile1
Mode:	Infrastructure
Security Mode:	Legacy
Authentication:	None
Encryption:	Open
Channel:	11 (2462 MHz)
Country:	USA
Transmit Power:	25 mW

Figure 8-3 *Current Profile Window*

Table 8-2 *Current Profile Window*

Field	Description
Profile Name	Displays the name of the profile that the mobile computer is currently using to communicate with the AP.
ESSID	Displays the current profile’s ESSID.
Mode	Displays the current profile’s mode, either Infrastructure or Ad-hoc. See *Table 4-2 on page 4-2*.

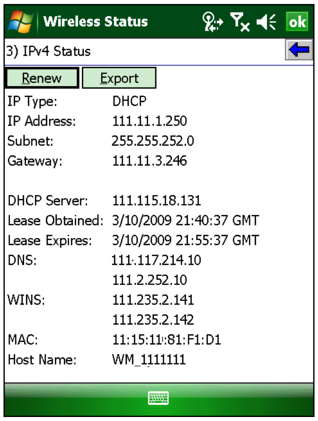
Table 8-2 *Current Profile Window (Continued)*

Field	Description
Security Mode	Displays the current profile’s security mode. See *Table 4-6 on page 4-5*.
Authentication	Displays the current profile’s authentication type. See *Table 4-7 on page 4-6*.
Encryption	Displays the current profile’s encryption type. See *Table 4-11 on page 4-18*.
Channel	Displays the channel currently being used to communicate with the AP.
Country	Displays the country setting currently being used.
Transmit Power	Displays the current radio transmission power level. See *Table 4-16 on page 4-24* and *Table 4-17 on page 4-25*.

IPv4 Status Window

The **IPv4 Status** window displays the current IP address, subnet, and other IP related information assigned to the mobile computer. It also allows renewing the IP address if the profile is using DHCP to obtain the IP information. Tap **Renew** to initiate the IP address renewal process. Tap **Export** to export IPv4 status information to a text file. The **IPv4 Status** window updates automatically when the IP address changes.

To open the **IPv4 Status** window, tap **IPv4 Status** in the **Wireless Status** window.



IP Type:	DHCP
IP Address:	111.11.1.250
Subnet:	255.255.252.0
Gateway:	111.11.3.246
DHCP Server:	111.115.18.131
Lease Obtained:	3/10/2009 21:40:37 GMT
Lease Expires:	3/10/2009 21:55:37 GMT
DNS:	111.117.214.10 111.2.252.10
WINS:	111.235.2.141 111.235.2.142
MAC:	11:15:11:81:F1:D1
Host Name:	WM_1111111

Figure 8-4 *IPv4 Status Window*

Table 8-3 *IPv4 Status Fields*

Field	Description
IP Type	Displays the IP address assignment method used for the current profile: **DHCP** or **Static**. If the IP Type is DHCP, the IP Address and other information shown is obtained from the DHCP server. In this case, the DHCP Server address and the Lease information will also be shown. If the IP Type is Static, the IP Address and other information shown are those that were entered in the profile.
IP Address	Displays the mobile computer's IP address. The Internet is a collection of networks with users that communicate with each other. Each communication carries the address of the source and destination networks and the particular machine within the network associated with the user or host computer at each end. This address is called the IP address. Each node on the IP network must be assigned a unique IP address that is made up of a network identifier and a host identifier. The IP address is shown in dotted-decimal notation with the decimal value of each octet separated by a period, for example, 192.168.7.27.
Subnet	Displays the mobile computer's subnet mask. Most TCP/IP networks use subnets to manage routed IP addresses. All IP addresses have a network part and a host part. The network part specifies a physical network. The host part specifies a host on that physical network. The subnet mask allows a network administrator to use some of the bits that are normally used to specify the host to instead specify physical sub-networks within an organization. This helps organize and simplify routing between physical networks.
Gateway	Displays the IP addresses of the gateways. A gateway forwards IP packets to and from a remote destination.
DCHP Server	Displays the IP address of the DHCP server.
Lease Obtained	Displays the date and time that the IP address was obtained.
Lease Expires	Displays the date and time that the IP address expires.
DNS	Displays the IP addresses of the DNS server.
WINS	Displays the IP addresses of the WINS servers. WINS is a Microsoft Net BIOS name service. A WINS server provides a cache or database of NetBIOS name translations, eliminating the need to broadcast NetBIOS requests to resolve these names to IP addresses.
MAC	The IEEE 48-bit address is assigned to the network adapter at the factory to uniquely identify the adapter at the physical layer.
Host Name	Displays the name of the mobile computer.

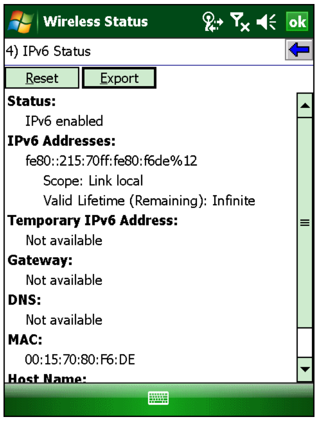
IPv6 Status Window

The **IPv6 Status** window displays IPv6 status, current IPv6 addresses and other IPv6 related information assigned to the WLAN interface. It also allows resetting the IPv6 address. The **IPv6 Status** window updates automatically when the IPv6 address changes.

Tap **Reset** to initiate IPv6 reset. Reset forces the TCP/IPv6 stack to re-bind to the WLAN interface. During re-bind, IPv6 stack discards its current IPv6 configuration and starts a fresh address auto configuration.

Tap **Export** to export IPv6 status information to a text file.

To open the **IPv6 Status** window, tap **IPv6 Status** in the **Wireless Status** window.



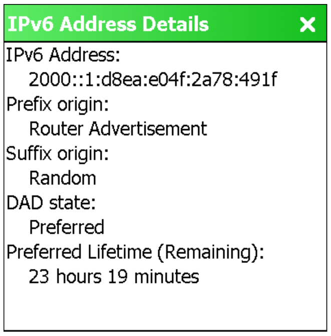
Status:
IPv6 enabled
IPv6 Addresses:
fe80::215:70ff:fe80:f6de%12
Scope: Link local
Valid Lifetime (Remaining): Infinite
Temporary IPv6 Address:
Not available
Gateway:
Not available
DNS:
Not available
MAC:
00:15:70:80:F6:DE
Host Name:

Figure 8-5 *IPv6 Status Window*

Table 8-4 *IPv6 Status Fields*

Field	Description
Status	Indicates whether IPv6 is enabled or disabled for the WLAN interface. You can enable or disable IPv6 from **Options** > **Enable IPv6**, see *IPv6 on page 7-5*.
IPv6 Addresses	Displays the mobile computer’s IPv6 addresses assigned to WLAN interface. Displays all IPv6 addresses except Temporary IPv6 address. For each IPv6 address, it shows the scope (link local/site local/global/unknown) and remaining valid lifetime of the address.
Temporary IPv6 Address	Displays the mobile computer's Temporary IPv6 address assigned to WLAN interface. It displays the scope and remaining valid lifetime of the address. Temporary IPv6 addresses are based on random interface identifiers and are generated for public address prefixes that use stateless address auto configuration.
Gateway	Displays the IPv6 address of the gateway. A gateway forwards IP packets to and from a remote destination.
DNS	Displays the IPv6 address of the DNS server.
MAC	The IEEE 48-bit address is assigned to the network adapter at the factory to uniquely identify the adapter at the physical layer.
Host Name	Displays the name of the mobile computer.

Double tap on a device **IPv6 Addresses** or **Temporary IPv6 address** to get more detailed information.



IPv6 Address Details

IPv6 Address:
2000::1:d8ea:e04f:2a78:491f
Prefix origin:
Router Advertisement
Suffix origin:
Random
DAD state:
Preferred
Preferred Lifetime (Remaining):
23 hours 19 minutes

Figure 8-6 *IPv6 Address Details Example*

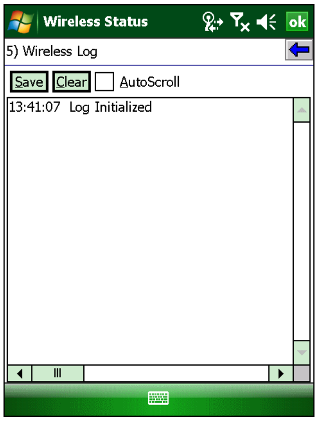
Table 8-5 *IPv6 Address Details Fields*

Field	Description
IPv6 Address	Displays the IPv6 address for which details are displayed.
Prefix origin	Displays the prefix origin for the IPv6 address. Possible values are Router Advertisement, Well-known, Manual, DHCPv6 or Unknown source.
Suffix origin	Displays the suffix origin for the IPv6 address. Possible values are Link layer address, Random, Well-known, Manual, DHCPv6 or Unknown source.
DAD state	Displays the Duplicate Address Detection state for the IPv6 address. Possible values are Preferred, Tentative, Deprecated, Duplicate or Invalid.
Preferred Lifetime (Remaining)	Displays the amount of time this address will remain in the Preferred state.

Wireless Log Window

The **Wireless Log** window displays a log of recent activity, such as authentication, association, and DHCP renewal completion, in time order. Save the log to a file or clear the log. The auto-scroll feature automatically scrolls down when new items are added to the log.

To open the **Wireless Log** window, tap **Wireless Log** in the **Wireless Status** window. The **Wireless Log** window displays.



13:41:07 Log Initialized

Figure 8-7 *Wireless Log Window*

Saving a Log

To save a Wireless Log:

1. Tap the **Save** button. The **Save As** dialog box displays.
2. Navigate to the desired folder.
3. In the **Name** field, enter a file name and then tap **OK**. The Wireless Log is saved as a text file in the selected folder.

Clearing the Log

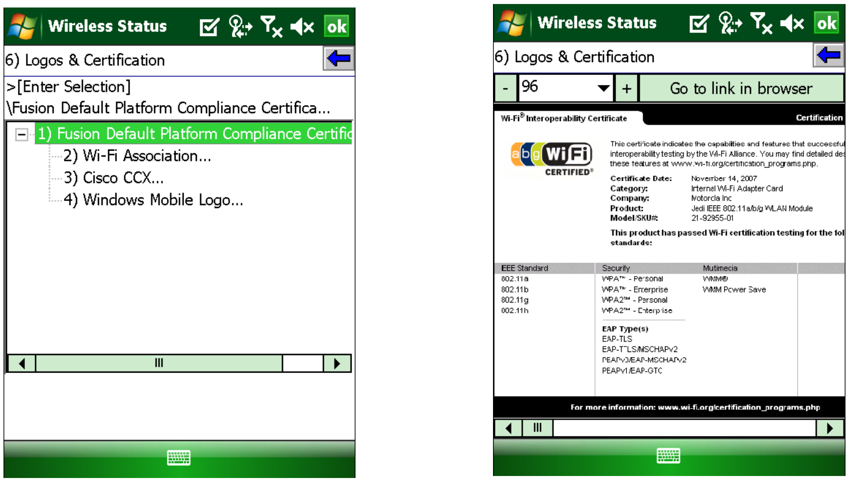
To clear the log, tap **Clear**.

Logos & Certifications Window

The **Logos & Certifications** window displays a list of logos and compliance standards supported by this device, such as Wi-Fi Interoperability and Cisco Compatible Extensions. Select an item in the list to view the corresponding certificate. For a list of supported standards, see *Table 8-6 on page 8-9*.

✓ ***NOTE*** If the certificate images corresponding to this device have been removed this menu entry may be hidden. Additionally, the certificate images may be removed to conserve storage space on the device.

To open the **Logos & Certifications** window, tap **Logos & Certifications** in the **Wireless Status** window.



>[Enter Selection]
\Fusion Default Platform Compliance Certifica...

1) Fusion Default Platform Compliance Certific
2) Wi-Fi Association...
3) Cisco CCX...
4) Windows Mobile Logo...

This certificate indicates the capabilities and features that successful interoperability testing by the Wi-Fi Alliance. You may find detailed des these features at www.wi-fi.org/certification_programs.php.

Certificate Date:	November 14, 2007
Category:	Internal Wi-Fi Adapter Card
Company:	Motorola Inc
Product:	Jedi IEEE 802.11a/b/g WLAN Module
Model/SKU#:	21-92955-01

This product has passed Wi-Fi certification testing for the fol standards:

EEE Standard	Security	Mutimecia
802.11a	WPA™ - Personal	WMM®
802.11b	WPA™ - Enterprise	WMM Power Save
802.11g	WPA2™ - Personal	
002.11h	WPA2™ - Enterprise	
	EAP Type(s)	
	EAP-TLS	
	EAP-TTLS/MSCHAPv2	
	PEAPv0/EAP-MSCHAPv2	
	PEAPv1/EAP-GTC	

For more information: www.wi-fi.org/certification_programs.php

Figure 8-8 *Logos & Certifications Window*

- When viewing the certificate, controls to adjust the zoom and scroll are available.
- For certain certificates a link is available to view the certificate in a browser, if an internet connection is available.
- Supported standards are as follows:

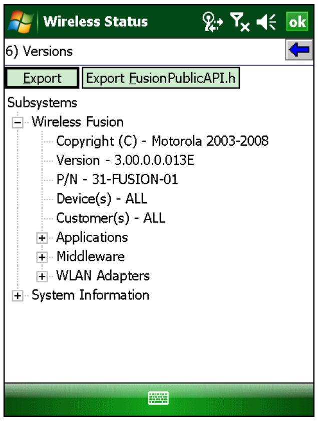
Table 8-6 *Logos & Certifications*

Certification	Description
Wi-Fi Association	This certificate indicates the device has passed Wi-Fi Alliance interoperability tests.
Cisco CCX	This certificate indicates the device has passed compliance tests for Cisco Compatible Extensions.
Windows Mobile Logo	This certificate indicates the device has passed the Windows Mobile Logo test.
FIPS	This certificate indicates the device has passed compliance tests for FIPS 140-2 Level 1.

Versions Window

The **Versions** window displays software, firmware, and hardware version numbers.

To open the **Versions** window, tap **Versions** in the **Wireless Status** window.



```
Subsystems
  Wireless Fusion
      Copyright (C) - Motorola 2003-2008
      Version - 3.00.0.0.013E
      P/N - 31-FUSION-01
      Device(s) - ALL
      Customer(s) - ALL
    Applications
    Middleware
    WLAN Adapters
  System Information
```

Figure 8-9 *Versions Window*

- The window displays Fusion software version numbers as well as application and middleware version information.
- Tap **Export** to export version information to a text file.
- Tap **Export FusionPublicApi.h** to export the current version of the FusionPublicAPI.h header file to the specified location.

Table 8-7 *Version Sub-categories*

Field	Description
Applications	Version information for Wireless Fusion Enterprise Mobility Suite applications.
Middleware	Version information for Wireless Fusion Enterprise Mobility Suite middleware components.
WLAN Adapters	Version and type information for WLAN adapters and the corresponding firmware and drivers.
Interface	Version and type information for the device’s interface to the WLAN adapter and the corresponding firmware.

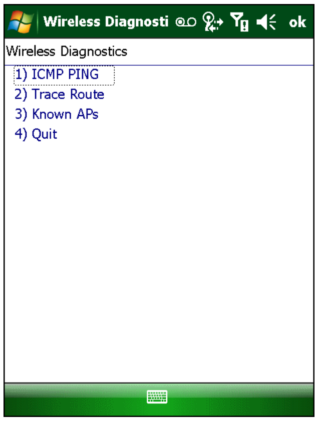
Table 8-7 *Version Sub-categories (Continued)*

Field	Description
Device	Device model and identification numbers.
OS	Operating System version information.

Chapter 9 Wireless Diagnostics Application

Introduction

The **Wireless Diagnostics** application window provides links to perform ICMP Ping, Trace Routing, and Known APs functions. To open the **Wireless Diagnostics** window, tap the **Signal Strength** icon > **Wireless Diagnostics**.



Wireless Diagnosti

ok

Wireless Diagnostics

1) ICMP PING
2) Trace Route
3) Known APs
4) Quit

Figure 9-1 *Wireless Diagnostics Window*

The **Wireless Diagnostics** window contains the following options. Tap the option to display the option window.

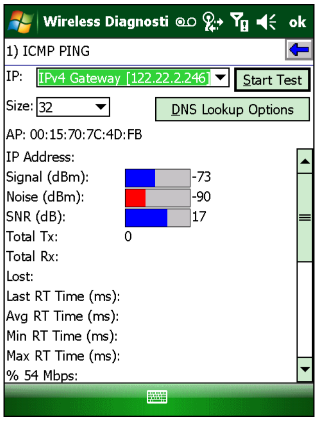
- ICMP Ping - tests the wireless network connection.
- Trace Route - tests a connection at the network layer between the mobile computer and any place on the network.
- Known APs - displays the APs in range using the same ESSID as the mobile computer.
- Quit - Exits the **Wireless Diagnostics** window.

Option windows contain a back button ⬅ to return to the **Wireless Diagnostics** window.

ICMP Ping Window

The **ICMP Ping** window allows testing of a connection at the network layer (part of the IP protocol) between the mobile computer and any other device on the network. Ping tests only stop when the **Stop Test** button is selected, the **Wireless Diagnostics** application is closed, or if the mobile computer switches between infrastructure and ad-hoc modes.

To open the **ICMP Ping** window, tap **ICMP Ping** in the **Wireless Diagnostics** window.



1) ICMP PING

IP: IPv4 Gateway [122.22.2.246]

Size: 32

AP: 00:15:70:7C:4D:FB

IP Address:

Signal (dBm): -73

Noise (dBm): -90

SNR (dB): 17

Total Tx: 0

Total Rx:

Lost:

Last RT Time (ms):

Avg RT Time (ms):

Min RT Time (ms):

Max RT Time (ms):

% 54 Mbps:

Figure 9-2 *ICMP Ping Window*

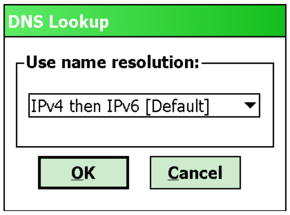
To perform an ICMP Ping:

1. In the **IP** field, enter an IP address or select an IP address from the drop-down list.
2. From the **Size** drop-down list, select a size value.
3. Tap **Start Test**. The ICMP Ping test starts. Information of the ping test displays in the appropriate fields.

The following statistics appear on the page:

- IPv4 Address or IPv6 Address – Target IP address.
- Signal - The current signal strength, measured in dBm, is provided both as a numerical value and as a histogram.
- Noise - The current noise level, measured in dBm, is provided both as a numerical value and as a histogram.
- SNR - The current signal to noise ratio, measured in dBm, is provided both as a numerical value and as a histogram.
- Total Tx - The total number of pings sent is displayed numerically.
- Total Rx - The total number of valid ping responses received is displayed numerically.
- Lost - The total number of pings that were lost is displayed numerically.
- RT Times - Four round trip times: Last, Average, Minimum, and Maximum are displayed in milliseconds.
- % Rates - For each of the 12 data rates, the number of times that rate was used to transmit the ping is displayed as a percentage.

Use the **DNS Lookup Options** button to select the name resolution priority. Select the option and tap **OK** button. If a name is entered in the IP field, DNS Lookup Options setting will decide whether to use IPv4 or IPv6 address for the test. By default, this is set to IPv4 then IPv6, which indicates that it will try to resolve the name to an IPv4 address; if this fails and if IPv6 is enabled, it will try to resolve the name to an IPv6 address.



DNS Lookup

Use name resolution:

IPv4 then IPv6 [Default]

Figure 9-3 *DNS Lookup Options Window*

Graphs

A real time graph of any of the above statistics can be displayed by double tapping on that statistic.

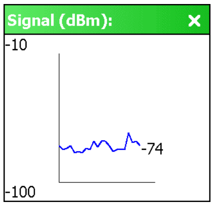


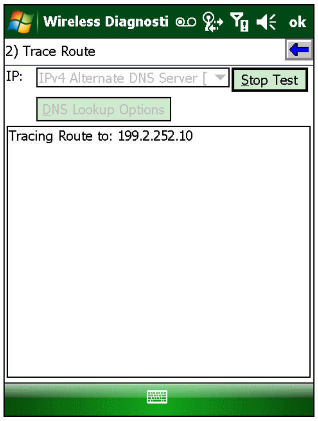
Figure 9-4 *Graph Example*

Trace Route Window

Trace Route traces a packet from a computer to a host, showing how many hops the packet requires to reach the host and how long each hop takes. The **Trace Route** utility identifies where the longest delays occur.

The **Trace Route** window allows testing a connection at the network layer (part of the IP protocol) between the mobile computer and any other device on the network.

To open the **Trace Route** window, tap **Trace Route** in the **Wireless Diagnostics** window.



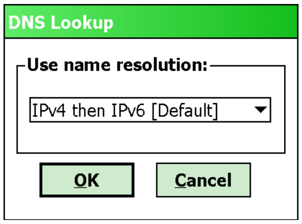
IP: IPv4 Alternate DNS Server [

```
Tracing Route to: 199.2.252.10
```

Figure 9-5 *Trace Route Window*

In the **IP** drop-down list, enter an IP address or choose one from the drop-down list, or enter a DNS Name and tap **Start Test**. When starting a test, the trace route attempts to find all routers between the mobile computer and the destination. The Round Trip Time (RTT) between the mobile computer and each router appears, along with the total test time. The total test time may be longer than all RTTs added together because it does not only include time on the network.

Use the **DNS Lookup Options** button to select the name resolution priority. Select the option and tap OK button. If a name is entered in the IP field, DNS Lookup Options setting will decide whether to use IPv4 or IPv6 address for the test. By default, this is set to IPv4 then IPv6, which indicates that it will try to resolve the name to an IPv4 address; if this fails and if IPv6 is enabled, it will try to resolve the name to an IPv6 address.



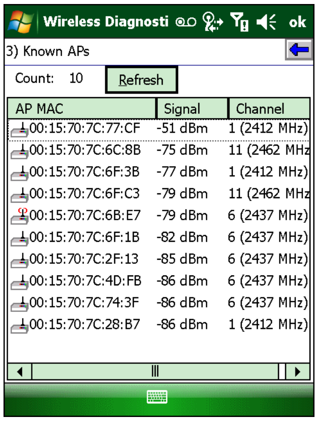
DNS Lookup

Use name resolution: IPv4 then IPv6 [Default]

Figure 9-6 *DNS Lookup Options Window*

Known APs Window

The **Known APs** window displays the APs in range using the same ESSID as the mobile computer. This window is only available in **Infrastructure** mode. To open the **Known APs** window, tap **Known APs** in the **Wireless Diagnostics** window.



3) Known APs

Count: 10

AP MAC	Signal	Channel
00:15:70:7C:77:CF	-51 dBm	1 (2412 MHz)
00:15:70:7C:6C:8B	-75 dBm	11 (2462 MHz
00:15:70:7C:6F:3B	-77 dBm	1 (2412 MHz)
00:15:70:7C:6F:C3	-79 dBm	11 (2462 MHz
00:15:70:7C:6B:E7	-79 dBm	6 (2437 MHz)
00:15:70:7C:6F:1B	-82 dBm	6 (2437 MHz)
00:15:70:7C:2F:13	-85 dBm	6 (2437 MHz)
00:15:70:7C:4D:FB	-86 dBm	6 (2437 MHz)
00:15:70:7C:74:3F	-86 dBm	6 (2437 MHz)
00:15:70:7C:28:B7	-86 dBm	1 (2412 MHz)

Figure 9-7 *Known APs Window*

See *Table 9-1* for the definitions of the icons next to the AP.

Table 9-1 *Current Profile Window*

Icon	Description
M	The AP is the associated access point, and is set to mandatory.
	The AP is the associated access point, but is not set to mandatory.
M	The mobile computer is not associated to this AP, but the AP is set as mandatory.
	The mobile computer is not associated to this AP, and the AP is not set as mandatory.

Tap and hold on an AP to display a pop-up menu with the following options: **Set Mandatory** and **Set Roaming**.

✓ ***NOTE*** **Set Mandatory** should only be used for testing purposes. It is not recommended for normal use.

Select **Set Mandatory** to prohibit the mobile computer from associating with a different AP. The letter *M* displays on top of the icon.

Select **Set Roaming** to cancel the Set Mandatory setting. This returns the mobile computer to its normal operation and allows it to roam to any AP with a better signal.

The Set Mandatory settings are temporary and will be lost if:

- You suspend and resume the mobile computer.
- You perform a warm or clean/cold boot.
- A new profile is selected, either via automatic Profile Roaming or by the user connecting to the profile from the **Manage Profiles** window.

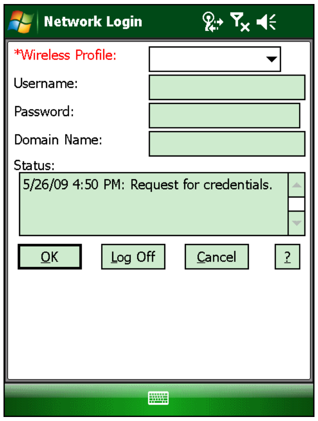
Tap **Refresh** to update the list of the APs with the same ESSID.

Chapter 10 Log On/Off Application

Introduction

There are two ways a user can connect to a profile when the profile requires credentials: either by using the **Manage Profiles** window, or by using the **Network Login** application.   In the first case, WCS automatically launches the Network Login window to allow the user to enter credentials when they are needed. In the second case, the user explicitly launches the Network Login window and supplies the credentials ahead of time and then tells the system to use them to connect. In either case, once the user has given the credentials, the user is said to have logged on (or in) to the profile. When the user has logged on to a profile, the system saves those credentials and the profile is said to have cached credentials.

When the user launches the **Network Login** application, the mobile computer may be in one of two states; the user may be logged onto one or more profiles, by having already entered credentials through the login window, or the user is not logged on to any profile. Each of these states has a separate set of use cases and a different look to the dialog box.



5/26/09 4:50 PM: Request for credentials.

Figure 10-1 *Network Login In Window*

Logging On

If not already logged on to any profile, the user can launch the **Network Login** window in order to select a profile to log on to.

If already logged into one or more profiles, the user can launch the **Network Login** window to perform any of these functions:

- Connect to a different profile.
- Connect to and re-enable a cancelled profile. To do this:
  - Launch the **Network Login** window.
  - Select the cancelled profile from the **Wireless Profile** drop-down list.
  - Login to the profile.

NOTE A cancelled profile can also be re-enabled by using the **Manage Profile** window to connect to the cancelled profile.

- Log off from all profiles simultaneously to prevent another user from accessing the current users network privileges.
- Switch mobile computer users.This is equivalent to performing a log off followed by a log on.

The appearance of the **Network Login** dialog box varies if it is:

- Launched by WCS, because the service is connecting to a new profile that needs credentials.
- Launched by WCS, because the service is trying to verify the credentials due to credential caching rules.
- Launched by a user, when a user is logged in.
- Launched by a user, when no user is logged in

Table 10-1 *Network Login Options*

Field	Description
Wireless Profile	When launching the login application, the Wireless Profile field lists all the wireless profiles that require credentials. This includes profiles that use EAP TLS, PEAP, LEAP, EAP-TTLS or EAP-FAST.
Profile Status icon	The profile status icon (next to the profile name) shows one of the following states:
✅	The profile is the current profile (always the case for WCS Launched).
▨	The selected profile is enabled but is not the current profile.
❌	The selected profile is cancelled.
Username	Used to obtain secure access on the selected Wireless profile. The **Username** and **Domain Name** fields combined are limited to 63 characters. If the field label is red, then entry is mandatory; if black, then the entry is optional.
Password	Along with the username, required to gain access to the network with the selected Wireless profile. The Password field is limited to 63 characters. If the field label is red, then entry is mandatory; if black, then the entry is optional.
Domain Name	Use to specify the network domain of the security server used for authentication. If the field label is red, then entry is mandatory; if black, then the entry is optional.

Table 10-1 *Network Login Options (Continued)*

Field	Description
Mask Password checkbox	The **Mask Password** checkbox determines whether the password field is masked (i.e., displays only the '*' character) or unmasked (i.e., displays the entered text). Check the box to unmask the password. Uncheck the box to mask the password (the default).
Status Field	The status field indicates the reason the dialog is open.

Tap **OK** to send the credentials to the WCS. If one or more of the required fields is left blank, a dialog box displays requesting the user to fill in all required fields.

Logging Off

The user can log off from all profiles simultaneously by launching the Network Login window and tapping the Log Off button. The **Log Off** button only displays when a user has cached credentials for one or more profiles. When the **Log Off** button is selected, the user is prompted with three options: **Log Off**, **Switch Users**, and **Cancel**. Switching users logs off the current user and re-initialize the Network Login window to be displayed for when there is no user logged on. Logging off logs off the current user from all profiles and closes the login dialog box. Tapping **Cancel** closes the Log Off dialog box and returns to the Login dialog box.

When the user is logged off, the mobile computer only roams to profiles that do not require credentials or to profiles that were created with the credentials entered into the profile.

Tap the **Cancel** button to close the Network Login window without logging into the network. If the Network Login window was launched by the WCS and not by the user, tapping **Cancel** first causes a message box to display a warning that the cancel will disable the current profile. If the user still chooses to cancel the login at this point, the profile is cancelled.

Once a profile is cancelled, the profile is suppressed until a user actively re-connects to it.

✓ ***NOTE*** Entering credentials applies the credentials to a particular profile. Logging out clears all cached credentials. Editing a profile clears any cached credentials for that profile.

Chapter 11 Persistence

Introduction

As you configure the Fusion settings (i.e., profiles, options, user and root certificates, and PACs), they are saved either in the Microsoft registry or in files in the file system. This allows the Fusion settings to persist across a warm boot. However, the registry and the volatile parts of the file system are lost after a cold boot on Windows CE devices and after a clean boot on Windows Mobile devices. So that the Fusion settings won’t be lost, Fusion provides a mechanism for persisting the Fusion settings across a clean/cold boot, Part of this mechanism is automatically implemented by Fusion, and part of it must be performed manually by the user.

This chapter discusses how to:

- make sure your Fusion settings, persist across a clean/cold boot.
- return the Fusion settings to their factory default values.

Persisting Fusion Settings

The Fusion settings that are saved in the registry include:

- Profiles.
- Options.

The Fusion settings that are saved in the file system include:

- User certificates.
- Root (server) certificates.
- PACs.

Fusion automatically persists user certificates, root certificates imported from .pfx files, and PACs. This data is stored in files in subfolders of the Application folder. The Application folder is part of the non-volatile file system and is not lost on a clean/cold boot. After the clean/cold boot, Fusion automatically reads the data back in from the files that have been saved under the Application folder and restores the settings.

Fusion relies on the user to help manually with persistence for profiles, options, and root certificates that are imported from .cer files. Since the profiles and options are stored in the registry, the user must export them to files under the Application folder before performing the clean/cold boot. You can use the Export function from the Options application. See xxx. When you import a root certificate from a .cer file, place the .cer file in \Application\RootCerts. This allows Fusion to find the .cer file after a clean/cold boot and re-install the root cert that it contains.

When you install a user certificate, be sure to install it either through the Profile Editor Wizard or through the Fusion Certificate Manager application. THis allows Fusion to automatically save the data for the user certificate in a special format to files in the Application\UserCerts folder.

Returning to Factory Default Settings

To return the Fusion settings to their factory default values, you must remove all files in which the Fusion settings are stored. Delete the following files from the mobile computer:

- The file that stores your Fusion profiles. This file will have been created manually and is usually named \Application\WCS_PROFILES.REG.
- The file that stores your Fusion option settings. This file will have been created manually and is usually named \Application\WCS_OPTIONS.REG.
- All files in \Application\RootCerts. For backward compatibility with previous versions, Fusion also searches, after a clean/cold boot, in \Application for persisted root certificates stored in files with the extension .cer. If you have manually placed any .cer files in \Application, remove them as well,
- All files in \Application\UserCerts.
- All files in \Application\Pacstore.

After you delete the files specified above, perform the clean/cold boot. The Fusion settings should be restored to their factory default values.

Chapter 12 Registry Controlled Features

This chapter is devoted to features of Fusion that can be turned on and off but do not have a standard Fusion user interface. Instead, these features are controlled by registry settings, and can be very useful. The following is a list of features that are described in this chapter:

- NPCS
- FIPS 140-2
- WMM UAPSD.

NPCS

Network Policy Configuration Service (NPCS) is a Microsoft feature. As far as Fusion is concerned it makes a decision as to whether or not Fusion should be disabled. The logic used to determine this is to apply a wireless LAN policy on the mobile computer using Open Mobile Alliance (OMA) Device Management (DM). This policy, when applied, modifies a registry key to indicate whether or not Fusion should be disabled.

If the registry key is set then:

- The wireless radio must be powered off;
- Users must not be able to scan or connect to WLAN access points.
- Users must not be able to send or receive data over a WLAN.
- WLAN-related UI must be disabled, hidden or grayed out.
- If the wireless LAN stack exposes any WLAN API's for third party applications they must be disabled.

A WLAN can be re-enabled if the registry key is properly modified.

The registry key monitored is:

[HKEY_LOCAL_MACHINE\Comm\NetworkPolicy\WiFi]

Edit the following key:

“Disabled”=dword:0

where:

dword:0 (or key not present) = disabled. Allow WLAN to function normally.

dword:1 (or greater) = enabled. Enforce the policy by disabling the radio and all the WLAN related User Interfaces.

FIPS 140-2

Motorola mobile computers that have Fusion version 3.00 and later installed have their AES cryptographic module Federal Information Processing Standard (FIPS) certified.

The FIPS publication number 140-2 (FIPS PUB 140-2) is titled Security Requirements for Cryptographic Modules and is the governing standard for Motorola mobile computers. The “-2” indicates that this document supersedes FIPS 140-1. This document is available from the NIST web site at:

http://csrc.nist.gov/publications/fips/fips140-2/fips1402.pdf

If FipsModeKey under the registry key:

[HKEY_LOCAL_MACHINE\Comm\Jedi10_1\Parms]

is set to a non-zero value, then the mobile computer is considered to be in the FIPS mode.

If the mobile computer is in the FIPS mode, then each time the radio is re-loaded (suspend / resume, warm boot, cold boot, etc.) the radio module is subjected to some integrity tests and self tests.

Edit the following key:

“FipsModeKey”=dword:0

where:

dword:0 (or key not present) = disabled. Allow WLAN to function normally - non-FIPS compliant.

dword:1 (or greater) = enabled. FIPS compliant. If power-on-self-tests fail then enforce the policy by disabling the radio.

WMM UAPSD

Using the registry, it is possible to disable the UAPSD (Unscheduled Automatic Power Save Delivery) feature of WMM (a.k.a., WMM Power Save). It may be advantageous to do this in order to improve throughput performance. The UAPSD feature is controlled through two registry values. These values reside under the key:

[HKEY_LOCAL_MACHINE\Comm\Jedi10_1\Parms]

The registry values are:

- APSDConfiguration (a DWORD value)
- CCXParams (a DWORD value)

UAPSD mode is on by default. To turn off UAPSD mode:

1. Set the APSDConfiguration value to 0 (0x0).
2. Set the CCXParams value to 5 (0x5).

To turn on UAPSD mode:

1. Set the APSDConfiguration value to 255 (0xFF).
2. Set the CCXParams value to 7 (0x7).

Chapter 13 Configuration Examples

Introduction

This chapter provides example procedures for configuring specific authentication and encryption types.

EAP–FAST/MS Chap v2 Authentication

To configure EAP-FAST and MS Chap v2 authentication:

1. Tap the **Signal Strength** icon to display the **Wireless Launcher** menu.

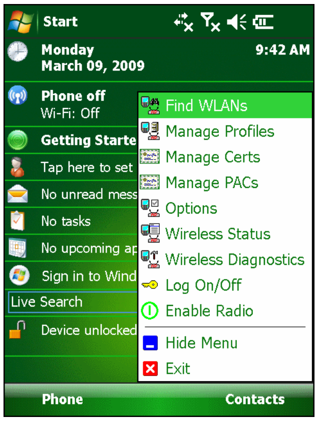


Figure 13-1 *Wireless Launcher Menu*

2. Select **Options**. The **Options** window appears.
3. In the drop-down list, select **Auto PAC Settings**. The **Auto PAC Settings** window appears.

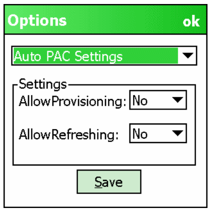

Options
Auto PAC Settings
Settings
AllowProvisioning: No
AllowRefreshing: No

Figure 13-2 *Auto PAC Settings Window*

4. In the **Allow Provisioning** drop-down list, select **Yes**.
5. In the **Allow Refreshing** drop-down list, select **Yes**.
6. Tap **Save**.
7. Tap **ok**.
8. Tap the **Signal Strength** icon to display the **Wireless Applications** menu.
9. Select **Manage Profiles**. The **Manage Profiles** window appears.
10. Tap and hold in the window and select **Add** from the pop-up menu. The **Profile Editor** window appears.
11. In the **Profile Name** text box enter a name for the profile.
12. In the **ESSID** text box enter the ESSID.

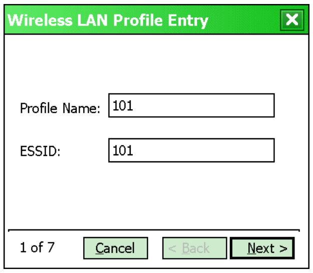

Wireless LAN Profile Entry
Profile Name: 101
ESSID: 101
1 of 7

Figure 13-3 *Profile ID Dialog Box*

13. Tap **Next.** The **Operating Mode** dialog box displays.
14. In the **Operating Mode** drop-down list, select **Infrastructure**.

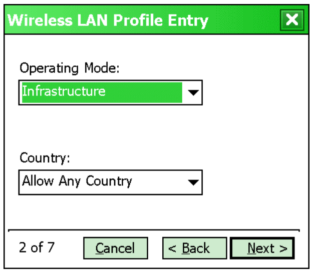
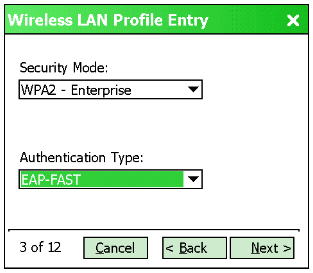

Wireless LAN Profile Entry
Operating Mode: Infrastructure
Country: Allow Any Country
2 of 7

Figure 13-4 *Operating Mode Dialog Box*

15. In the **Country** drop-down list, select the country that the device is in.
16. Tap **Next**. The **Security Mode** dialog box displays.
17. In the **Security Mode** drop-down list, select **WPA2-Enterprise**.


Wireless LAN Profile Entry

Security Mode: WPA2 - Enterprise

Authentication Type: EAP-FAST

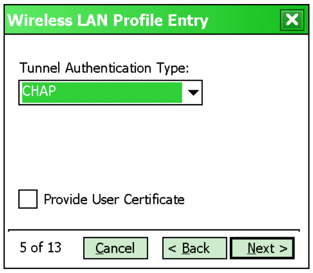
3 of 12

Figure 13-5 *Authentication Dialog Box*

18. In the **Authentication** drop-down list, select **EAP-FAST**.

19. Tap **Next**. The **Tunneled Authentication Type** dialog box displays.

20. In the **Tunneled Authentication Type** drop-down list, select **MS CHAP v2**.


Wireless LAN Profile Entry

Tunnel Authentication Type: CHAP

□ Provide User Certificate

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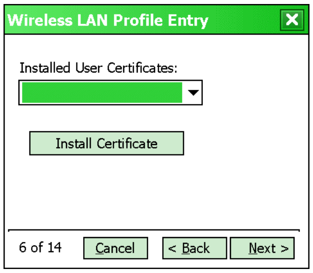
Figure 13-6 *Tunneled Authentication Dialog Box*

21. Select the **Provide User Certificate** check box if a certificate is required.

22. Tap **Next**. The **Installed User Certificates** dialog box appears.


Wireless LAN Profile Entry

Installed User Certificates:

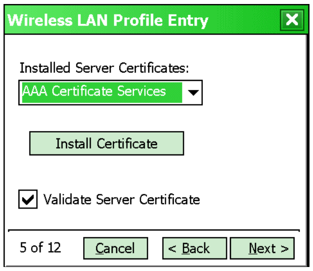
6 of 14

Figure 13-7 *Installed User Certificates Dialog Box*

23. Select a certificate from the drop-down list of currently installed certificates before proceeding. The selected certificate's name appears in the drop-down list.

    If the required certificate is not in the list, tap **Install Certificate**. See *User Certificate Installation on page 4-9* for information on installing User Certificates.

24. Tap **Next**. The **Install Server Certificate** dialog box appears.



Installed Server Certificates: AAA Certificate Services

☑ Validate Server Certificate

Figure 13-8 *Installed Server Certificates Dialog Box*

25. Select a certificate from the drop-down list of currently installed certificates. The selected certificate's name appears in the drop-down list.

If the required certificate is not in the list, tap **Install Certificate**. See *Server Certificate Installation on page 4-11* for information on installing Server Certificates.

26. Tap **Next**. The **User Name** dialog box appears.

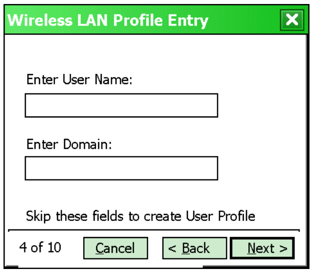
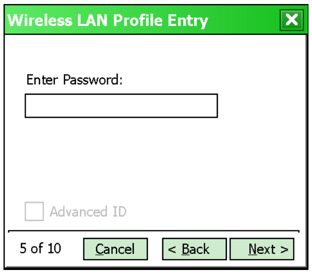

Wireless LAN Profile Entry
Enter User Name:
Enter Domain:
Skip these fields to create User Profile
4 of 10
Cancel
< Back
Next >

Figure 13-9 *User Name Dialog Box*

The user name and password can be entered (but is not required) when the profile is created. If the username and password are not entered in the profile, then when attempting to connect, the user is be prompted to supply them. The entered information (credentials) will be saved (cached) for future reconnections.

27. Tap **Next**. The **Password** dialog box appears.



□ Advanced ID

Figure 13-10 *Password Dialog Box*

28. In the **Enter Password** text box, enter a password. Note that if a username was entered and no password is entered, Fusion assumes that no password is a valid password.

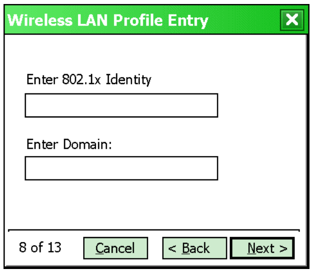
29. Select the **Advanced ID** check box, if advanced identification is desired.

30. Tap **Next.**

If the **Advanced ID** is not selected, the **Prompt for Login** dialog box appears. Go to step XX.

The **Advanced ID** dialog box appears.

31. Use the **Advanced ID** dialog box to enter the 802.1X identity to supply to the authenticator. This value can be 63 characters long and is case sensitive. In TTLS and PEAP, it is recommended entering the identity *anonymous* (rather than a true identity) plus any desired realm (e.g., anonymous@myrealm). A user ID is required before proceeding.

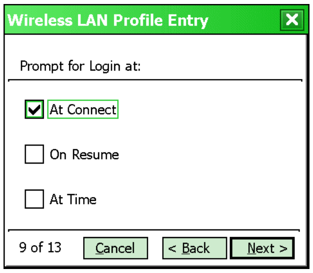

Wireless LAN Profile Entry

Enter 802.1x Identity

Enter Domain:

Figure 13-11 *Advanced Identity Dialog Box*

32. Tap **Next**. The **Prompt for Login** dialog box displays. See *Credential Cache Options on page 4-15* for detailed information on configuring Login settings.


Wireless LAN Profile Entry

Prompt for Login at:

☑ At Connect

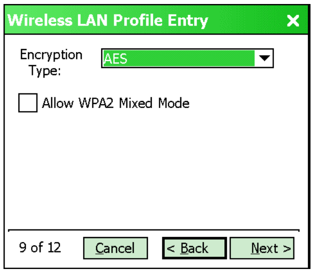
□ On Resume

□ At Time

Figure 13-12 *Prompt for Login at Dialog Box*

33. Tap **Next**. The **Encryption** dialog box displays.

34. In the **Encryption Type** drop-down list, select **AES**.

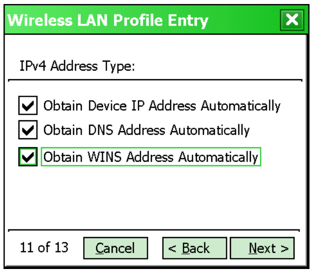

Wireless LAN Profile Entry

Encryption Type: AES

□ Allow WPA2 Mixed Mode

Figure 13-13 *Encryption Dialog Box*

35. Tap **Next**. The **IP Address Type** dialog box displays.


Wireless LAN Profile Entry

IPv4 Address Type:

☑ Obtain Device IP Address Automatically

☑ Obtain DNS Address Automatically

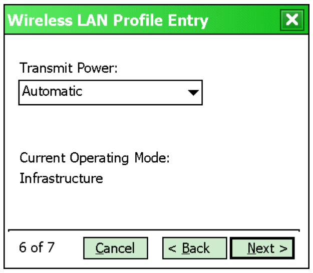
☑ Obtain WINS Address Automatically

Figure 13-14 *IP Address Entry Dialog Box*

36. Ensure that all three check boxes are selected.

37. Tap **Next**. The **Transmit Power** dialog box displays.

38. In the **Transmit Power** drop-down list select a power mode.



Wireless LAN Profile Entry

Transmit Power: Automatic

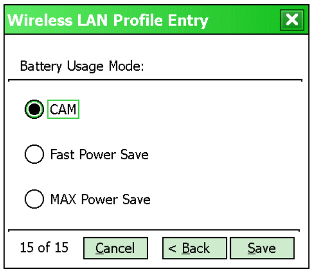
Current Operating Mode: Infrastructure

6 of 7

Figure 13-15 *Transmit Power Dialog Box*

39. Tap **Next**. The **Battery Usage** dialog box appears.

40. In the **Battery Usage Mode** dialog box select a power consumption option.



Wireless LAN Profile Entry

Battery Usage Mode:

● CAM

○ Fast Power Save

○ MAX Power Save

15 of 15

Figure 13-16 *Battery Usage Dialog Box*

41. Tap **Save**.

Glossary

A

API. An interface by means of which one software component communicates with or controls another. Usually used to refer to services provided by one software component to another, usually via software interrupts or function calls

C

Clean Boot. See Cold Boot.

Cold Boot. A cold boot restarts the mobile computer and erases all user stored records and entries. The operating system is reloaded; files not stored in “protected” folders are erased; the registry is erased and reloaded from “REG” files saved in protected folders.

CCX. Cisco Compatible Extensions. A proprietary set of specified requirements that are used to improve the connectivity of mobile devices.

CCKM. Cisco’s Central Key Management. Part of CCX, a proprietary methodology to enhance the connectivity during AP to AP roaming.

Cradle. A cradle is used for charging the terminal battery and for communicating with a host compute. It also provides a storage place for the terminal when not in use.

H

Hard Reset. See **Cold Boot**.

Host Computer. A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs and network control.

I

IEEE Address. See **MAC Address**.

I/O Ports. interface The connection between two devices, defined by common physical characteristics, signal characteristics, and signal meanings. Types of interfaces include RS-232 and PCMCIA.

Input/Output Ports. I/O ports are primarily dedicated to passing information into or out of the terminal's memory. Series 9000 mobile computers include Serial and USB ports.

IP. Internet Protocol. The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts "packets" from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a "datagram" to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.

IP Address. (Internet Protocol address) The address of a computer attached to an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a IP network. Client workstations have either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

K

Key. A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, **Encryption** and **Decrypting**.

M

MC. Mobile Computer.

Mobile Computer. In this text, *mobile computer* refers to a Motorola hand-held computer. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

O

Open System Authentication. Open System authentication is a null authentication algorithm.

P

PAN . Personal area network. Using Bluetooth wireless technology, PANs enable devices to communicate wirelessly. Generally, a wireless PAN consists of a dynamic group of less than 255 devices that communicate within about a 33-foot range. Only devices within this limited area typically participate in the network.

Parameter. A variable that can have different values assigned to it.

PING. (Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

Q

QWERTY. A standard keyboard commonly used on North American and some European PC keyboards. “QWERTY” refers to the arrangement of keys on the left side of the third row of keys.

R

RAM. Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

RF. Radio Frequency.

Router. A device that connects networks and supports the required protocols for packet filtering. Routers are typically used to extend the range of cabling and to organize the topology of a network into subnets. See **Subnet**.

S

Shared Key. Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.

Soft Reset. See **Warm Boot**.

Subnet. A subset of nodes on a network that are serviced by the same router. See **Router**.

Subnet Mask. A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.

T

TCP/IP. (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications. TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted. IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.

Terminal. See **Mobile Computer**.

TFTP. (Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading firmware, downloading software and remote booting of diskless devices.

U

UDP. User Datagram Protocol. A protocol within the IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

W

Warm Boot. A warm boot restarts the mobile computer and closes all running programs. All data that is not saved to flash memory is lost.

Index

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