



Diagnostics

This chapter describes the ACU's diagnostic tools and provides procedures for using them.

The following topics are covered in this chapter:

- [Overview, page 6-2](#)
- [Viewing the Current Status of Your Client Adapter, page 6-2](#)
- [Viewing Statistics for Your Client Adapter, page 6-7](#)

Overview

In addition to enabling you to configure your client adapter for use in various types of networks, the ACU provides tools that enable you to assess the performance of the client adapter and other devices on the wireless network. ACU's diagnostic tools perform the following functions:

- Display your client adapter's current status and configured settings
- Display statistics pertaining to your client adapter's transmission and reception of data

[Table 6-1](#) enables you to quickly locate the instructions for using each of the diagnostic tools.

Table 6-1 Locating Diagnostic Instructions

Diagnostic Tool	Page Number
Status	6-2
Statistics	6-7

Viewing the Current Status of Your Client Adapter

The ACU enables you to view the current status of your client adapter as well as many of the settings that are configured for the adapter.

To view your client adapter's status and settings, select **Status** from the Commands pull-down menu. The Status screen appears. [Figure 6-1](#) shows a typical Status screen with the signal strength values displayed as a colored bar across the bottom of the screen.

Figure 6-1 Typical Status Screen

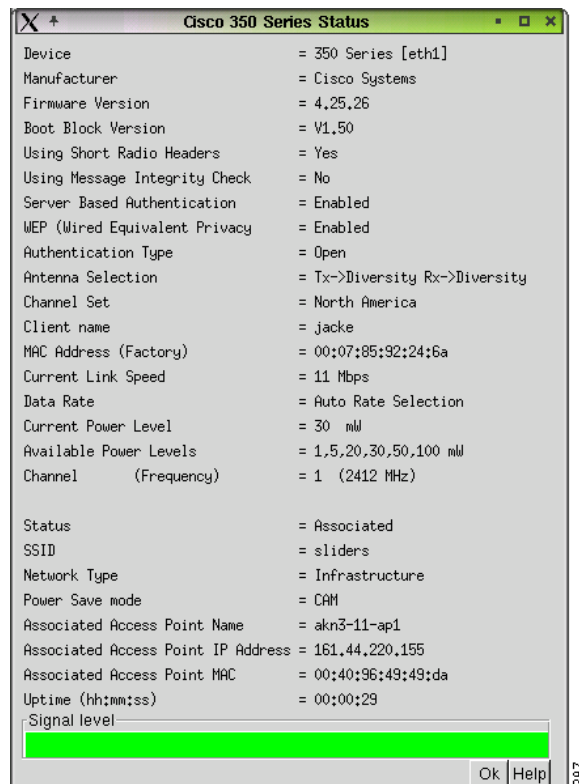


Table 6-2 describes each client adapter setting for which status is displayed.

Table 6-2 Client Adapter Status

Client Adapter Setting	Description
Device	<p>A description of your client adapter.</p> <p>Note If your computer has more than one client adapter installed, this field also indicates which adapter is being used, such as eth1 or eth2.</p>
Manufacturer	The manufacturer of your client adapter.
Firmware Version	The version of the firmware that is running on your client adapter.
Boot Block Version	The version of the boot block firmware that is in your client adapter. The boot block firmware contains identification information for the client adapter, starts the radio, and passes control to the main firmware, which (unlike the boot block) can be modified and upgraded by the user.
Using Short Radio Headers	<p>Shows whether your client adapter is set up to use short radio headers.</p> <p>Value: Yes or No</p> <p>Note See the Use Short Radio Headers parameter in Table 6-3 for information on using short radio headers.</p>
Using Message Integrity Check	<p>Indicates whether your client adapter is using message integrity check (MIC) to protect packets sent to and received from the access point.</p> <p>MIC prevents bit-flip attacks on encrypted packets. During a bit-flip attack, an intruder intercepts an encrypted message, alters it slightly, and retransmits it, and the receiver accepts the retransmitted message as legitimate. Client adapters using Linux driver 2.0 or greater and firmware version 4.25.2x or greater support MIC; however, MIC can be used only if it is also enabled on the access point.</p> <p>Value: Yes or No</p> <p>Note If the access point is using MIC, your client adapter's driver and firmware must support MIC; otherwise, the client cannot associate.</p>
Server Based Authentication	<p>Shows whether LEAP is enabled for your client adapter.</p> <p>Value: Enabled or Disabled</p> <p>Note The status reports disabled when using LEAP and enabled when not using LEAP.</p> <p>Note See the the Server Based Authentication parameter in “Server-Based Authentication” section on page 4-2 for information on LEAP.</p>

Table 6-2 Client Adapter Status (continued)

Client Adapter Setting	Description
WEP (Wired Equivalent Privacy)	Shows your client adapter's WEP status. Value: Enabled, Not Enabled, or Need Firmware Upgrade Note See the Enable WEP parameter in “Enabling WEP” section on page 4-5 for instructions on enabling WEP.
Authentication Type	Shows whether the client adapter must share the same WEP keys as the access point in order to associate or can associate with the access point regardless of WEP settings. If the client can associate, it passes data if it and the access point are using shared key authentication. However, if a client and access point are using WEP, and the access point is using open authentication, the WEP keys do not have to match for the client to associate. But when the client has associated with the WEP key mismatch, it will be unable to send data to or receive data from the access point. Value: Open or Shared Key Note See the Access Point Authentication parameter in Table 5-2 on page 5-5 for information on setting the authentication type.
Antenna Selection	The antenna mode that your client adapter is using. Value: Diversity, Right Only, Left Only (Right Only is the only option for PCI client adapters) Note See the Antenna Mode (Receive) and Antenna Mode (Transmit) parameters in Table 5-6 on page 5-17 and Table 5-7 on page 5-19 for information on setting the antenna mode.
Channel Set	The regulatory domain for which your client adapter is configured, such as North America. (For the Japan channel set, the Call ID is also displayed.) This value is not user-selectable. Note Refer to Appendix A for a list of channel identifiers, channel center frequencies, and regulatory domains for each channel.
Client Name	The name your client adapter uses when it associates to an access point. Note Client Name is an optional setting; the adapter performs with or without a configured client name. Note See the Client Name parameter in Table 6-2 for information on setting the client name.
MAC Address (Factory)	The MAC address assigned to your client adapter at the factory.
Current Link Speed	The rate at which your client adapter is transmitting data packets. Value: 1, 2, 5.5, or 11 Mbps

Table 6-2 Client Adapter Status (continued)

Client Adapter Setting	Description
Data Rate	<p>The rate at which your client adapter is configured to transmit or receive data packets.</p> <p>Value: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps, or Auto Rate Selection</p> <p>Note See the Data Rate parameter in Table 6-3 for information on setting the client adapter's data rate.</p>
Current Power Level	<p>The power level at which your client adapter is transmitting. The maximum level is dependent upon the radio installed in your client adapter and your country's regulatory agency.</p> <p>Value: 1, 5, 15, 20, 30, 50, or 100 mW (30 mW is the maximum power level supported by 340 series client adapters)</p> <p>Note 15 mW is supported only by 340 series client adapters, 20 and 100 mW is only supported by 350 series client adapters.</p> <p>Note See the Transmit Power parameter in Table 6-3 for information on setting the client adapter's power level.</p>
Available Power Levels	<p>The power levels at which your client adapter is capable of transmitting. The maximum level is dependent upon the radio installed in your client adapter and your country's regulatory agency.</p> <p>Value: 1, 5, 15, 20, 30, 50, or 100 mW (30 mW is the maximum power level supported by 340 series client adapters)</p> <p>Note 15 mW is supported only by 340 series client adapters, and 20 mW is supported only by 350 series client adapters.</p> <p>Note See the Transmit Power parameter in Table 6-3 for information on the client adapter's available power levels.</p>
Channel (Frequency)	<p>The frequency that your client adapter is using as the channel for communications.</p> <p>Value: Dependent on regulatory domain</p> <p>Note See the Channel parameter in Table 6-3 for information on selecting the frequency for your client adapter.</p>
Status	<p>The operational mode of your client adapter.</p> <p>Value: Error, Configured, Associated, Not Associated, or Ad Hoc Mode</p>
SSID	<p>The SSID that your client adapter is using.</p> <p>Note See the SSID1 parameter in Table 6-2 for information on the client adapter's SSID.</p>

Table 6-2 Client Adapter Status (continued)

Client Adapter Setting	Description
Network Type	<p>The type of network in which your client adapter is being used.</p> <p>Value: Infrastructure or Ad Hoc</p> <p>Note See the Network Type parameter in Table 6-2 and Table 5-4 on page 5-14 for information on setting the network type.</p>
Power Save Mode	<p>The client adapter's current power consumption setting.</p> <p>Value: CAM, Max PSP, or Fast PSP</p> <p>Note See the Power Save Mode parameter in Table 6-2 for information on setting the client adapter's power save mode.</p>
Associated Access Point Name	<p>The name of the access point to which your client adapter is associated. It is shown only if the access point was configured with a name and you are in infrastructure mode.</p>
Associated access point IP Address	<p>The IP address of the access point to which your client adapter is associated. It is shown only if the access point was configured with an IP address and you are in infrastructure mode.</p> <p>Note If 0.0.0.0 is displayed, it might be due to using WEP and having a WEP key mismatch. The IP address of the access point is sent in an encrypted packet (assuming WEP is being used) and if the WEP keys do not match, the packet is not processed.</p>
Associated Access Point MAC	<p>The MAC address of the access point to which your client adapter is associated. It is shown only if you are in infrastructure mode.</p>
Up Time (hh:mm:ss)	<p>The amount of time (in hours:minutes:seconds) that the client adapter has been receiving power. If the adapter has been running for more than 24 hours, the time is displayed in days, hours:minutes:seconds.</p>
Signal Level	<p>The signal strength for all received packets. The more green the bar graph shows, the stronger the signal.</p> <p>Range: 0 to 100% or -95 to -45 dBm</p>

Viewing Statistics for Your Client Adapter

The ACU enables you to view statistics that shows how data is being received and transmitted by your client adapter.

To view your client adapter's statistics, select **Statistics** from the Commands pull-down menu. The statistics are calculated as soon as your client adapter is started or the Reset button is selected.

Figure 6-2 shows a typical Statistics screen.

Figure 6-2 Typical Statistics Screen

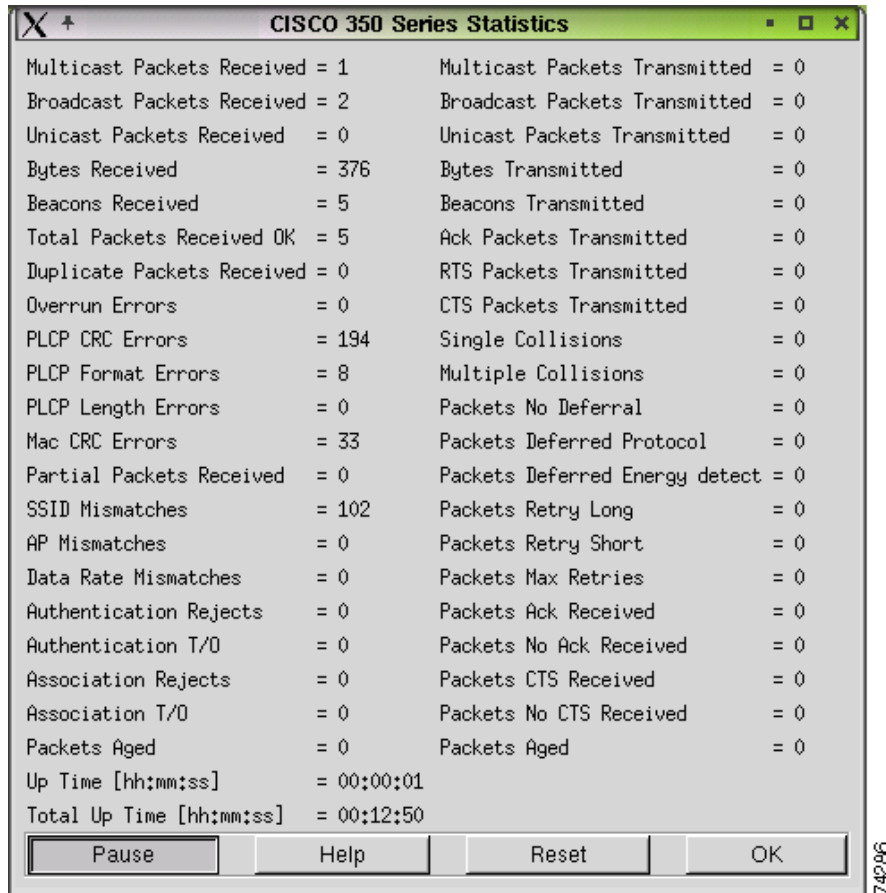


Table 6-3 describes each statistic that is displayed for your client adapter.

Table 6-3 Client Adapter Statistics

Statistic	Description
Receive Statistics	
Multicast Packets Received	The number of multicast packets that were received successfully.
Broadcast Packets Received	The number of broadcast packets that were received successfully.
Unicast Packets Received	The number of unicast packets that were received successfully.
Bytes Received	The number of bytes of data that were received successfully.
Beacons Received	The number of beacon packets that were received successfully.
Total Packets Received OK	The number of all packets that were received successfully.
Duplicate Packets Received	The number of duplicate packets that were received successfully.
Overrun Errors	The number of packets received when no receive buffers were available. These errors usually occur when the host does not read the received packets from the client adapter fast enough.
PLCP CRC Errors	The number of times the client adapter started to receive an 802.11 Physical Layer Convergence Protocol (PLCP) header but the rest of the packet was ignored due to a cyclic redundancy check (CRC) error in the header.
PLCP Format Errors	The number of times an 802.11 PLCP header was received with a valid CRC but the rest of the packet was ignored due to an unknown value in the header.
PLCP Length Errors	The number of times an 802.11 PLCP header was received but the rest of the packet was ignored due to an illegal header length.
MAC CRC Errors	The number of packets that had a valid 802.11 PLCP header but contained a CRC error in the data portion of the packet.
Partial Packets Received	The number of fragments that were discarded because the entire packet was not received successfully.
SSID Mismatches	The number of times a packet was received by the radio that contained an SSID field that does not match its own. Generally, this applies to probe response and beacon packets and indicates the possibility of some coverage overlap between two RF cells having different SSIDs.
AP Mismatches	The number of times a packet was received by the radio from an access point that is not a specified parent but is using the same SSID. Typically, this statistic is generated by access points not in the specified parent that reply to probe requests. Beacons transmitted by non-specified parent access points can also increment this statistic.
	Note See the specified access point 1–4 parameter in Table 5-6 on page 5-17 for information on specifying access points.

Table 6-3 Client Adapter Statistics (continued)

Statistic	Description
Data Rate Mismatches	The number of times a packet was received where the field indicating the data rates supported does not match the specified rates the client radio is using. This statistic is typically generated by receiving beacons, probe responses, or both from access points configured with different rates than the client radio. Note See the Data Rate parameter in Table 6-3 for information on supported data rates.
Authentication Rejects	The number of times the client adapter tried to authenticate to an access point but was rejected.
Authentication T/O	The number of times the client adapter tried to authenticate to an access point but was unable to because the access point did not respond fast enough (timed out).
Association Rejects	The number of times the client adapter tried to associate to an access point but was rejected.
Association T/O	The number of times the client adapter tried to associate to an access point but was unable to because the access point did not respond fast enough (timed out).
Packets Aged	The number of packets received successfully but discarded by the client adapter because either all fragments were not received within 10 seconds or the host did not read the packet from the adapter within 10 seconds.
Packets MIC OK	The number of packets that were received successfully with a valid MIC.
Packets No MIC	The number of packets that were discarded due to no MIC being found.
Packets Incorrect MIC	The number of packets that were discarded due to an incorrect MIC value.
Packets no MIC Seed	The number of packets that were discarded due to no MIC seed being received.
Packets Wrong MIC Sequence	The number of packets that were discarded due to the MIC sequence number being wrong.
Up Time (hh:mm:ss)	The amount of time (in hours:minutes:seconds) since the Reset button was selected. If the client adapter runs for more than 24 hours, the time is displayed in days, hours:minutes:seconds.
Total Up Time (hh:mm:ss)	The amount of time (in hours:minutes:seconds) that the client adapter has been receiving power. The total up time continues to increment even if the Reset button is selected. If the adapter runs for more than 24 hours, the time is displayed in days, hours:minutes:seconds.
Transmit Statistics	
Multicast Packets Transmitted	The number of multicast packets that were transmitted successfully.

Table 6-3 Client Adapter Statistics (continued)

Statistic	Description
Broadcast Packets Transmitted	The number of broadcast packets that were transmitted successfully.
Unicast Packets Transmitted	The number of unicast packets that were transmitted successfully.
Bytes Transmitted	The number of bytes of data that were transmitted successfully.
Beacons Transmitted	The number of beacon packets that were transmitted successfully (in ad hoc mode only).
Ack Packets Transmitted	The number of acknowledgment (Ack) packets that were transmitted in response to successfully received unicast packets.
RTS Packets Transmitted	The number of request-to-send (RTS) packets that were transmitted successfully.
CTS Packets Transmitted	The number of clear-to-send (CTS) packets that were transmitted in response to a successfully received RTS packet.
Single Collisions	The number of packets that had to be retransmitted once due to a collision.
Multiple Collisions	The number of packets that had to be retransmitted more than once due to additional collisions.
Packets No Deferral	The number of packets that were able to be transmitted immediately without being delayed due to energy detect or protocol deferral.
Packets Deferred Protocol	The number of packets that were delayed due to 802.11 protocol reasons (such as not enough time left to send the packet).
Packets Deferred Energy Detect	The number of packets that were delayed because RF energy was already detected. This condition is usually caused by another radio transmitting a packet or by some other RF source jamming the signal (such as a microwave oven).
Packets Retry Long	The number of normal data packets that were retransmitted.
Packets Retry Short	The number of request-to-send (RTS) packets that were retransmitted.
Packets Max Retries	The number of packets that failed to be transmitted successfully after exhausting the maximum number of retries.
Packets Ack Received	The number of transmitted packets that had their corresponding acknowledgment (Ack) packet received successfully.
Packets No Ack Received	The number of transmitted packets that did not have their corresponding Ack packet received successfully.
Packets CTS Received	The number of clear-to-send (CTS) packets that were received in response to an RTS packet.
Packets No CTS Received	The number of packets for which no CTS packet was received in response to a RTS packet.
Packets Aged	The number of packets that were discarded by the client adapter because they were not transmitted successfully within 5 seconds.