



## Performing a Link Test

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### Link Test

A link test is used to determine the quality of the radio link between two devices. Two types of link-test packets are transmitted during a link test: request and response. Any radio receiving a link-test request packet fills in the appropriate text boxes and echoes the packet back to the sender with the response type set.

The radio link quality in the client-to-access point direction can differ from that in the access point-to-client direction due to the asymmetrical distribution of the transmit power and receive sensitivity on both sides. Two types of link tests can be performed: a ping test and a CCX link test.

With the *ping link test*, the controller can test link quality only in the client-to-access point direction. The RF parameters of the ping reply packets received by the access point are polled by the controller to determine the client-to-access point link quality.

With the *CCX link test*, the controller can also test the link quality in the access point-to-client direction. The controller issues link-test requests to the client, and the client records the RF parameters (received signal strength indicator [RSSI], signal-to-noise ratio [SNR], and so on) of the received request packet in the response packet. Both the link-test requestor and responder roles are implemented on the access point and controller. Not only can the access point or controller initiate a link test to a CCX v4 or v5 client, but a CCX v4 or v5 client can initiate a link test to the access point or controller.

The controller shows these link-quality metrics for CCX link tests in both directions (out— access point to client; in— client to access point):

- Signal strength in the form of RSSI (minimum, maximum, and average)
- Signal quality in the form of SNR (minimum, maximum, and average)
- Total number of packets that are retried
- Maximum retry count for a single packet
- Number of lost packets
- Data rate of a successfully transmitted packet

The controller shows this metric regardless of direction:

- Link test request/reply round-trip time (minimum, maximum, and average)

The controller software supports CCX versions 1 through 5. CCX support is enabled automatically for every WLAN on the controller and cannot be disabled. The controller stores the CCX version of the client in its client database and uses it to limit the features for this client. If a client does not support CCXv4 or v5, the controller performs a ping link test on the client. If a client supports CCXv4 or v5, the controller performs a CCX link test on the client. If a client times out during a CCX link test, the controller switches to the ping link test automatically.




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**Note** Follow the instructions in this section to perform a link test using either the GUI or the CLI.

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This section contains the following subsections:

## Performing a Link Test (GUI)

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**Step 1** Choose **Monitor > Clients** to open the Clients page.

**Step 2** Hover your cursor over the blue drop-down arrow for the desired client and choose **LinkTest**. A link test page appears.

**Note** You can also access this page by clicking the MAC address of the desired client and then clicking the **Link Test** button on the top of the Clients > Detail page.

This page shows the results of the CCX link test.

**Note** If the client and/or controller does not support CCX v4 or later releases, the controller performs a ping link test on the client instead, and a much more limited link test page appears.

**Note** The Link Test results of CCX clients when it fails will default to ping test results if the client is reachable.

**Step 3** Click **OK** to exit the link test page.

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## Performing a Link Test (CLI)

Use these commands to run a link test using the controller CLI:

- Run a link test by entering this command:

```
linktest ap_mac
```

When CCX v4 or later releases is enabled on both the controller and the client being tested, information similar to the following appears:

```
CCX Link Test to 00:0d:88:c5:8a:d1.
  Link Test Packets Sent..... 20
  Link Test Packets Received..... 10
  Link Test Packets Lost (Total/AP to Client/Client to AP).... 10/5/5
```

```

Link Test Packets round trip time (min/max/average)..... 5ms/20ms/15ms
RSSI at AP (min/max/average)..... -60dBm/-50dBm/-55dBm

RSSI at Client (min/max/average)..... -50dBm/-40dBm/-45dBm

SNR at AP (min/max/average)..... 40dB/30dB/35dB
SNR at Client (min/max/average)..... 40dB/30dB/35dB
Transmit Retries at AP (Total/Maximum)..... 5/3
Transmit Retries at Client (Total/Maximum)..... 4/2
Transmit rate: 1M 2M 5.5M 6M 9M 11M 12M 18M 24M 36M 48M 54M 108M

Packet Count: 0 0 0 0 0 0 0 0 0 2 0 18 0
Transmit rate: 1M 2M 5.5M 6M 9M 11M 12M 18M 24M 36M 48M 54M 108M

Packet Count: 0 0 0 0 0 0 0 0 0 2 0 8 0

```

When CCX v4 or later releases is not enabled on either the controller or the client being tested, fewer details appear:

```

Ping Link Test to 00:0d:88:c5:8a:d1.
  Link Test Packets Sent..... 20
  Link Test Packets Received..... 20
  Local Signal Strength..... -49dBm
  Local Signal to Noise Ratio..... 39dB

```

- Adjust the link-test parameters that are applicable to both the CCX link test and the ping test by entering these commands from configuration mode:

**linktest frame-size** *size\_of\_link-test\_frames*

**linktest num-of-frame** *number\_of\_link-test\_request\_frames\_per\_test*

