TARANA

BROADBAND REINVENTED

What's New in TCS 2023-01

PN: 10-0037-001 Rev. 1.0

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Intended Audience

This document is intended for use by Tarana customers and their employees who use Tarana Cloud Suite (TCS) to monitor, manage, and troubleshoot a Tarana G1 network, which consists of Tarana Base Nodes and Remote Nodes (BNs and RNs). G1 BNs and RNs use the unlicensed spectrums 5 GHz and 3 GHz (CBRS).

Note: For the most up-to-date documentation and videos, see our support portal at: https://support.taranawireless.com/hc/en-us

DHCP Option 82 Support

DHCP Option 82 is the DHCP Relay Agent Information Option. When a DHCP client requests an IP address in a network using a DHCP relay agent, the relay agent uses the Option 82 contents to ensure that the client receives the IP address when the DHCP server responds and to ensure the identities of the communicating devices.

Customer Application

In a Tarana network using DHCP Option 82, the base node acts as a DHCP relay. When you enable DHCP Option 82 on a base node, the base node receives client DHCP requests, and then relays the DHCP request to the DHCP server with the DHCP Option 82 information included. DHCP servers that are Option 82-enabled respond to the base node, and the base node removes the Option 82 information, and then forwards the DHCP response to the client. The client device does not play a role in the DHCP Option 82 exchange and cannot detect when DHCP Option 82 is used or that the DHCP relay exists on the network. Because of this transparent operation, no additional configuration is required on the remote node for DHCP Option 82 to function.

Option 82 information includes one or more suboptions that contain information shared by the base node. The suboptions are defined for a relay agent that is co-located in a public circuit access unit. Common suboptions include the Agent Circuit ID for the incoming circuit, and an Agent Remote ID that provides a trusted identifier for the remote high-speed modem.

An Option 82-enabled DHCP server can use a relay agent identity and client source-port information to administer IP addressing policies based on client and relay agent location within the network.

A device operating as an Option 82 relay agent for DHCP clients can enhance network access protection in the following ways:

- The relay agent can block attempts to use an invalid Option 82 field to imitate an authorized client.
- The relay agent can block attempts to use response packets with missing or invalid Option 82 suboptions to imitate valid response packets from an authorized DHCP server.

Feature Description

The following sections describe how the DHCP Option 82 protocol functions and how you can configure your base node to act as a DHCP relay using Option 82

General Deployment Information

For the DHCP with Option 82 to function properly the following must be true:

- The client device must be configured to request an IP address via DHCP.
- The base node must be configured to act as a DHCP relay and must have the required suboptions, such as the Agent Circuit ID or Agent Remote ID configured. In a Tarana network, the Agent Circuit ID identifies the remote node, and the Agent Remote ID identifies the base node. In Tarana Cloud Suite (TCS), the Agent Circuit ID and Agent Remote ID are combined in a single control labeled *Remote/Circuit Identifier Type*, which can use either the MAC address or the serial number of the devices.
- The DHCP server must be configured to accept and respond to DHCP Option 82. Because the base node defines the Option 82 values using lower case, the DHCP server must be configured accordingly.

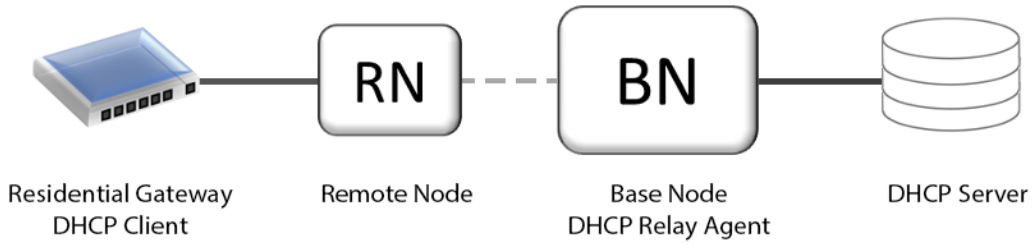

Figure 1: General DHCP Option 82 network topology

Protocol Action

In figure 1, the residential gateway is an end-user device that is connected to the remote node. When it requests an address from the DHCP server, the request moves through the remote node and the base node to the DHCP server. The DHCP server response returns through the base node and the remote node to the residential gateway. The following is the formal process:

1. The residential gateway initiates the DHCP exchange by requesting an IP address using the DHCP protocol without DHCP Option 82 information.
2. The remote node receives the DHCP Request packet and retransmits it to the base node unaltered.
3. The base node, acting as the DHCP relay, receives the DHCP request packet, inserts the DHCP Option 82 fields, and then sends the new DHCP Request packet to the DHCP server.
4. The DHCP server receives the DHCP Request packet and decodes the DHCP Option 82 fields, which it uses to uniquely identify the base node and remote node pair.
5. The DHCP server responds by sending the DHCP Response packet that includes the DHCP Option 82 fields back to the base node.
6. The base node receives the DHCP Response, removes the DHCP Option 82 fields, and then forwards the DHCP Response packet to the residential gateway.
7. The residential gateway uses the DHCP Response to configure its IP address information.

Configure in TCS

To configure the base node to act as a DHCP Relay Agent and include DHCP Option 82 information, do the following:

1. Log in to TCS with Op Admin privileges.
2. Navigate to **Devices > List**, and then select **BN** to display the complete list of base nodes in the table.
3. Click the Serial Number link of the base node you want to configure.
4. Click **WebUI** ( ), and then log in to the device through the web interface.
5. Navigate to **Setup**.
6. **Enable DHCP Relay Agent**.
7. Choose either Serial Number or MAC Address from the **Remote/Circuit Identifier Type** drop-down list.

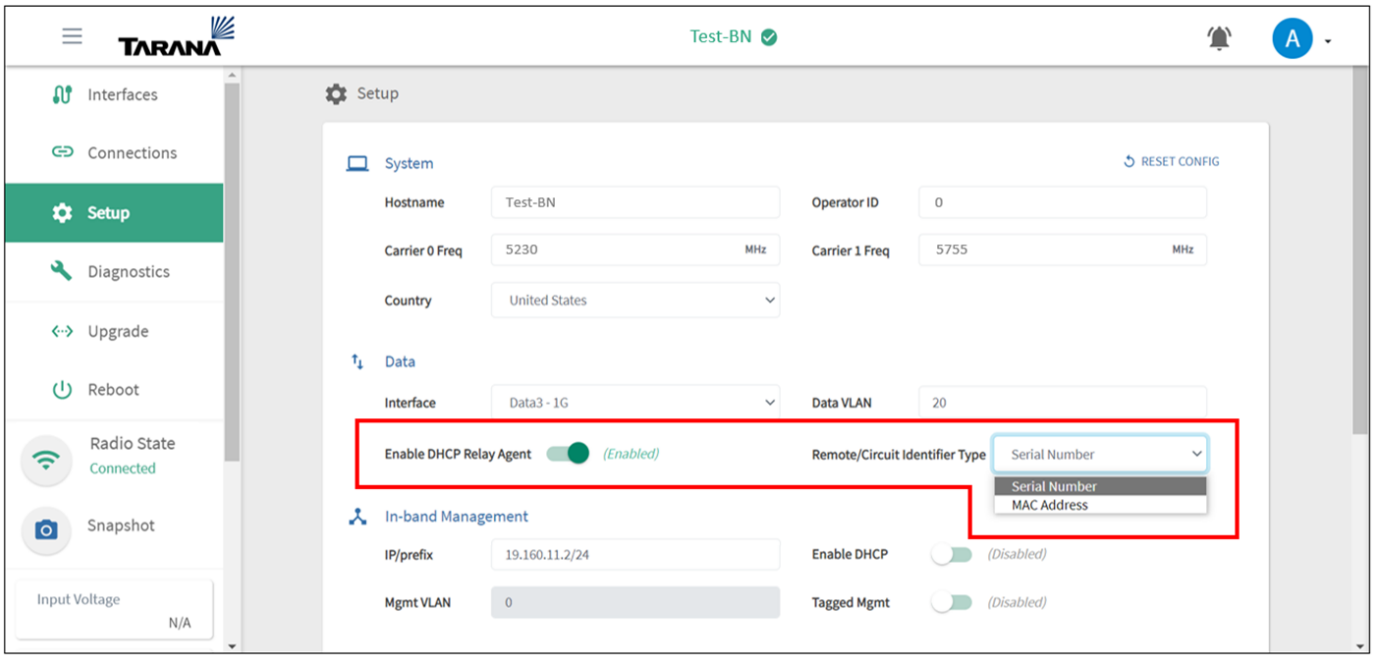

Figure 2: DHCP Option 82 configuration dialog

Speed Test

This release introduces a link speed test that you can use to verify both the uplink speed and the down speed. The speed test also provides additional information about the quality of the signal.

Customer Application

Testing link speed is an important step in maintaining a quality network. It is also an important first step after installation to establish a baseline of link performance. When you run the speed test, TCS first tests the downlink speed, and then the uplink speed. TCS then displays the results in a report dialog, such as the dialog in Figure 3.

In addition to the quantitative link metrics, the speed test report dialog also includes identification information, such as the remote node serial number and the base node serial number. The dialog also contains a control to mark the test results as a baseline measurement. It is a good practice to run a speed test after installing a new base node or remote node so that you can obtain network performance information before any network-related influences such as new interference sources begin to affect link quality. You can run a speed test periodically to track performance over time, and the report dialog provides a switch to compare with the baseline measurements for the test device.

Feature Description

When you run the speed test, TCS begins with a downlink test, which takes about 30 seconds. TCS suspends normal data transfer, and then sends test data from the base node to the remote node to determine the downlink speed. During the downlink test, the remote node reports the signal-to-noise ratio (SNR) to TCS. When the downlink test is complete, TCS displays the following information in a report dialog:

- Downlink throughput in megabits per second (Mbps)
- Downlink SNR
- Carrier (Carrier 0 for the downlink)
- Carrier frequency in megahertz (MHz)
- Carrier bandwidth (MHz)
- RF Range in meters (m)
- Pathloss in decibels (dB)

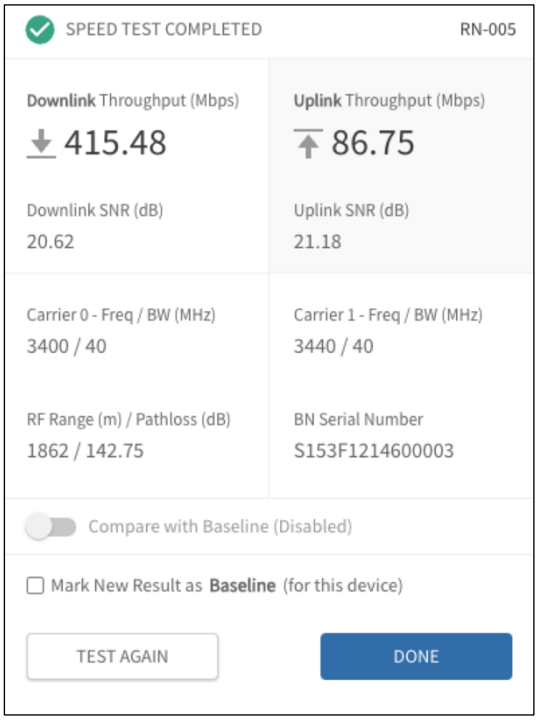

Figure 3: Speed test report dialog

TCS then begins the uplink speed test, which takes about an addition 30 seconds. TCS continues to suspend normal data traffic, and then sends test data from the remote node to the base node. During the uplink test, the base node reports the SNR of the incoming signal to TCS. When the uplink test is complete, TCS displays the speed test report dialog with the following information:

- Uplink throughput (Mbps)
- Uplink SNR
- Carrier (Carrier 1 for the uplink)
- Carrier frequency (MHz)
- Carrier bandwidth (MHz)

Speed Test Procedure in TCS

Before you perform a speed test, ensure that the link you want to test is an active link with a base node and a remote node that can communicate, can send and receive data, and are visible in TCS as active devices. The speed test suspends normal traffic and can disrupt the current active network traffic. Ensure that affected subscribers or network users are aware that the speed test scheduled.

To begin the speed test, do the following:

1. Log in to TCS with Op Admin privileges.
2. Navigate to **Devices > List**, and then select **RN** to display the complete list of remote nodes in the table.
3. Click the Serial Number link of the remote node whose link you want to test.
4. In the tool menu, select **Diagnostics ( )** > **Speed Test**. TCS displays a warning that the speed test can affect subscriber traffic.
5. In the warning dialog, select **Start Test**.

During the speed test, the dialog displays a progress bar and an estimated time remaining for the current test—downlink or uplink—to complete. As information is confirmed or calculated, it appears in the dialog. Carrier information is given, so the carrier number, frequency, and bandwidth appear first in both the downlink and uplink sections, along with the RF range and the pathloss.

If you need to stop the test, you can select **Stop Test**.

Mark a Result as Baseline

When a speed test is complete, you can set a particular speed test result as a baseline. You can conduct speed test during the installation as you make adjustments to the network. When you find an optimal configuration, you can establish the speed test of the configuration as the baseline speed test against which you can compare

future speed tests. To establish a baseline result, conduct a speed test as described above, and then do the following when the speed test completes:

1. Select **Mark New Result as Baseline (for this device)**.
2. Select **Done**.

TCS stores the result with previous speed tests, but marks it as the baseline, so that you can compare future speed test with it without needing to search for it in the speed test history.

You can also set a previous speed test as a baseline independent of the speed test dialog. Previous speed tests appear on the remote node page. To set a previous speed test as a baseline, do the following:

1. Log in to TCS with Op Admin privileges.
2. Navigate to **Devices > List**, and then select **RN** to display the complete list of remote nodes in the table.
3. Click the Serial Number link of the remote node whose speed test you want to set as a baseline.
4. If the Speed Test results table does not appear, select **Load More Items** to reveal it (Figure 4).
5. Select **Set Baseline**, choose the result you want to mark as the new baseline speed test using the radio button, and then select **Set Baseline**. The new baseline entry appears in green text.

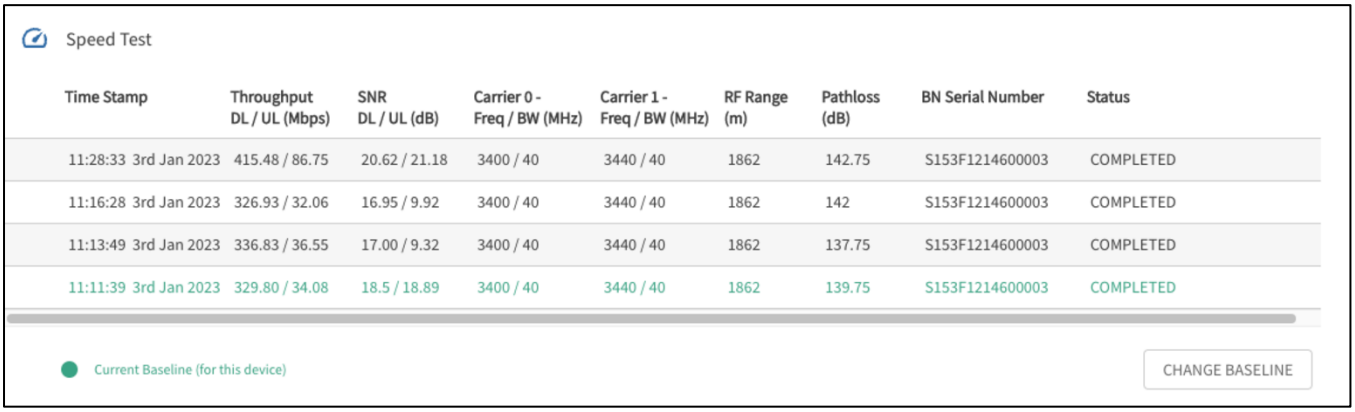

Figure 4: Speed Test results table in TCS with the baseline speed test in green text

Compare Result to a Baseline

As you monitor, audit, or troubleshoot your network, you can compare periodic or ad hoc speed tests with the baseline speed test. To compare your current speed test with the baseline, conduct a speed test as described above, and then do the following when the speed test completes:

1. Enable **Compare with Baseline**.
2. Select **Done**.

When you enable Compare with Baseline, the Speed Test report dialog displays the results from the current test in normal-color text followed by the baseline values in green text (Figure 5).

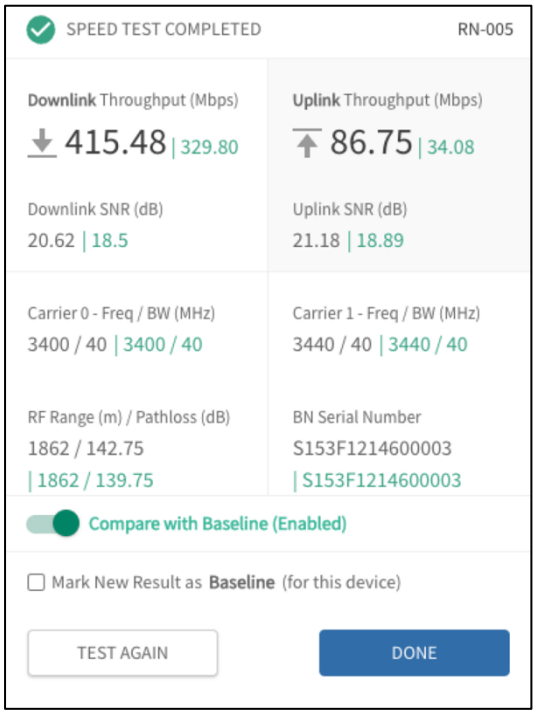

Figure 5: Speed Test result compared with baseline values

Usability Enhancements

Devices Table Default Values

This version of TCS defines new default columns for the Devices table. To view the currently selected column, navigate to **Devices > List**, and then select **Customize** to open the Customize Table dialog. The selected check boxes indicate the currently visible columns. You can select **Reset** to choose only the factory-default columns. Select **Done** to commit the change and view only the factory-default columns, or **Cancel** to return to the previous visible columns without committing changes.

Default Base Node Column	Default Remote Node Columns
Link Metrics • Rx Signal Carrier 0 • Rx Signal Carrier 1 • Active Connections **System Metrics** • Hostname • Sector • Cite • Management IP • Alarms Count • System **Uptime** **Hardware Metrics** • Serial Number **Planning Metrics** • [None] **Location Metrics** • [None]	**Link Metrics** • Rx Signal Carrier 0 • Rx Signal Carrier 1 • RF Range • Path Loss • Link Uptime • DL SINR • UL SINR • DL Peak (24 hrs) • UL Peak (24 hrs) **System Metrics** • Hostname • Alarms Count • System Uptime **Hardware Metrics** • Serial Number **Planning Metrics** • [None] **Location Metrics** • Primary BN • Sector BN

Tooltip Column Descriptions

Device table column headers often contain much information and with limited space in a table cell, lengthy or complex information must be collapsed into acronyms and initialisms to save space, which can make them difficult to understand. You can now hover your mouse pointer over column headers to view a tooltip description of the column.

Map Device Overflow Notification

Because the map view only supports 1024 visible devices, some devices might be hidden when more than 1024 devices are available to appear. Where there are more than 1024 devices available to appear on a map, TCS now prompts you to refine your selection so that fewer than 1024 devices are visible.

SLA Profile Configuration Improvement

SLA Profile drop-down list now displays the current SLA profile in edit mode, along with a Cancel (⊗) button to opt out of the edit.

To edit the SLA profile, navigate to **Devices > List**, select the serial number of a device, and then select the SLA Profile edit icon in the green system status card.

Refine Network Selection Message Clarification

If the current Devices table view contains more than 1024 entries, TCS cannot display them and you must refine your device selection to include 1024 or fewer devices. To make this clearer in TCS, the notification has been updated.

Devices Table Column Change

The Management IP column has been removed from the remote node Devices table and is no longer available to select in the Customize dialog.

Base Node Status Card Change

In the base node status card, the Backhaul IP has been renamed to Mgmt IP to more helpfully reflect how the information is used when testing network connectivity.

About Tarana

Tarana Wireless, Inc. is the performance leader in fixed wireless access network solutions, powered by a number of industry-first and well-proven breakthroughs in perfect, multidimensional optimization of radio signals. Its Gigabit 1 fixed access system overcomes previously insurmountable network economics challenges for service providers in both mainstream broadband and underserved markets, using free unlicensed spectrum. The company is headquartered in Milpitas, California, with additional research and development in Pune, India. For more information, visit taranawireless.com.