G1 Device Software Release Notes 2.013.003

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Note: For the most up-to-date manuals, please download the latest version of this document on our customer portal: support.taranawireless.com

Intended Audience

This document is intended for use by system administrators and engineers interested in the design, daily management, operations, and troubleshooting of a Tarana G1 network including Base Nodes, Remote Nodes, and the Tarana Cloud Suite (TCS).

It is assumed that the reader has a good working knowledge of radio frequency (RF), wireless systems, and networking concepts.

The G1 products are designed for installation and use by trained professionals and require adherence to all relevant regulatory, safety, and telecom industry best practice guidelines for outdoor radios. It is assumed that the Tarana G1 Base Node and Remote Nodes have been installed onsite and are connected to the TCS.

Models Supported by Release 2.013.003

Frequency	Device Type	Part Number	Description
5 GHz	BN	30-0134-001	5 GHz Base Node
	RN	30-0128-001 30-0150-001 30-0160-001	5 GHz Residential Node
3.5 GHz	BN	30-0141-001	3.5 GHz CBRS Base Node
	RN	30-0142-001 30-0152-001	3.5 GHz CBRS Residential Node
6 GHz	BN	30-0171-001	6 GHz Base Node
	RN	30-0170-001	6 GHz Residential Node

Backward Compatibility

BN ---> / RN	0.989	0.997	1.205	1.400	2.011
0.989	✅	✅	✅	✅	✅
0.997	✅	✅	✅	✅	✅
1.205	✅	✅	✅	✅	✅
1.400	✅	✅	✅	✅	✅
2.011	✅	✅	✅	✅	✅

- Any BN with current software revision 1.205 or 1.400 can be directly upgraded to 2.013.003.
- Any BN with current software revision lower than 1.205 must be upgraded to 1.205 or 1.400 before upgrading to 2.013.003.
- Any RN with 0.989 or higher can be directly upgraded to 2.013.003. **If the RN is on 0.988 or below, it must first be upgraded to 0.997 before upgrading to 2.013.003**.
- It is recommended that the RNs be upgraded first followed by the BNs.
- 1.205.007 is the minimum required software version for 6 GHz devices (30-0171-001 and 30-0170-001). For 6 GHz RNs with part number 30-0170-001-**2.x** or higher the minimum software version is 2.013.003.
- Deprecated SW versions : Support / Defect fixes for the following versions will be deprecated:
    - 0.989 - March 31, 2024
    - 0.997 - June 30, 2024

Security Fixes

None

Key Features

#	Description
1	**4-carrier mode for the 6 GHz devices**
	- UNII-3, UNII-5, UNII-4* and UNII-7 bands are supported
	- 6 GHz BNs can be configured to be in 2-carrier or 4-carrier mode (from TCS)
	- 6 GHz RNs can be configured to be in 2-carrier or auto (default) mode (from TCS)
	[Please refer to the 6 GHz 4-Carrier Operation application note for the capabilities and tradeoffs of using the 4-carrier mode]
2	**Buffer Allocation Profiles**
	- A 'Maximum Size' buffer allocation profile is now supported in addition to the the Default profile
	- The 'Maximum Size' profile is applicable for specific traffic patterns like RFC2544 or similar
	- For normal user traffic, the Default profile is strongly recommended
3	**Support for IPv6 user traffic**
	- IPv6 traffic is now supported on the dataplane
	- SLAAC or DHCPv6 can be used network host configuration
4	**Regulatory updates**
	- Philippines support: UNII-1 (5180 - 5310 MHz), UNII-2 (5510 - 5660 MHz), UNII-3 (5740 - 5840 MHz)
	- Support for 5870 MHz channel in UNII-4 band

*Operators need to have an STA from the FCC to operate in UNII-4 (5.850–5.895 GHz)

Defects Fixed

#	Description
G1-19700	The RFC2544 tests will report lower than expected throughput. Deep buffer selection support is now available. Please select 'Maximum Size' as the Buffer Allocation Profile for running RFC2544 or similar tests.
G1-22890	In some rare cases, upgrading the BN software would fail.
G1-24419	In some rare cases the BN would drop the links and get into a locked up state and needed a power cycle to recover.
G1-22245	When running a round-trip throughput test from the BN Device UI, the latency was incorrectly reported. Note that both BN and RN should be running 2.011 software for the accurate results.
G1-24110	In rare cases, some 6 GHz RNs were reporting incorrect location coordinates.

Known Limitations

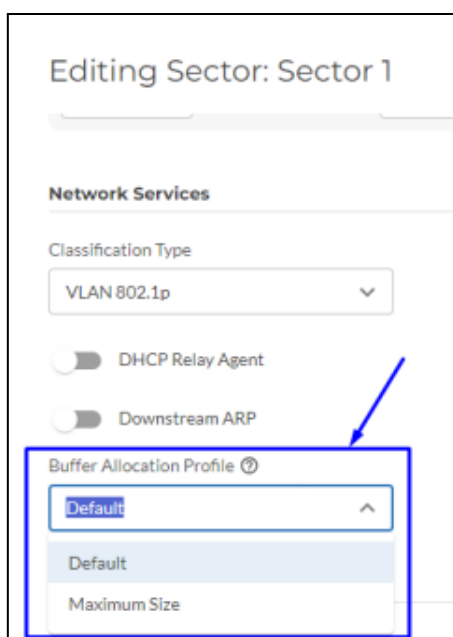| #	Description
G1-19650	Device UI logs the user out on browser refresh. Please login again.
G1-19069	While asymmetric grant allows RNs to have partial spectrum relative to the BN spectrum, in some cases there might be a brief (< 5 mins) link disruption.
G1-20784	Updating configuration parameters on BN/RN web UI spawned through TCS might result in inconsistent behavior. Recommended way is to use TCS UI to configure the parameters.
G1-21734	In heavy-interference environments, if a Speed test is executed to characterize link performance, the initial results might show lower than expected speeds. Please re-run the test multiple (4 to 5) times. The increased link utilization results in speeding up the link optimization.
G1-23317	It is observed (very rarely) that a few links have high capacity even if there is no user traffic. This potentially takes away certain air interface resources to be used by other users.
G1-21531	The ARP broadcast feature, if enabled downstream, will broadcast ARP packets to all RNs independent of the subscriber-VLAN configurations for the RNs.
G1-22898	Some CBRS BNs operating in high interference environments might undergo a radio reset due to calibration failure.
G1-20816	ARP broadcast feature is not supported in case of untagged data VLAN.

Buffer Allocation Profile

The 2.013 software version adds support to select the buffer allocation profiles. The following 2 profiles are supported:

- Default
  - Uses standard buffer sizes similar to previous software versions.
  - Tarana strongly recommends using this profile for regular user traffic.
- Maximum Size
  - Uses large buffer sizes to reduce packet loss at the expense of increased latency.
  - Only recommended for RFC2544 or similar benchmarking tests

Selecting the buffer allocation profiles

To set the Buffer Allocation Profile, go to the **Admin → Network Configuration** section in TCS. Navigate to the **Sector level** and click Edit. Select the desired value, then click DONE.

Downstream multicast support

Multicast traffic in the downstream direction is now supported to allow IPv6 on the data plane along with other select multicast protocols.

- SLAAC and DHCPv6 for IPv6

  - Currently available in TCS for configuration.

- Multicast protocols: OSPF-v4, LDP, v6-all-nodes, OSPF-v6, CDP, ROMON, STP, PBSTP, CPVST, LLDP

  - Please contact Tarana support for enabling multicast traffic.

Appendix A: RN Installation Guidance (added in 1.205.007)

Operator ID	Unique operator ID assigned by Tarana. Please ensure that it is correctly configured (i.e. matches with the BN).
Primary BN (P-BN)	If primary BN (P-BN) is configured, this will be the BN preferred by the RN. If the P-BN is found, the RN will stop searching and connect to the P-BN. If the P-BN is not found by the end of search, the best BN with the highest search metric is selected, as shown in the BN Search History. [Diagnostics Page] Note: 1. Set the P-BN only if you know the exact BN that the RN should connect to. 2. Setting an incorrect P-BN will result in the RN waiting 15 minutes (default) to find the P-BN before moving on to alternate BNs. 3. Please delete the P-BN if you didn't intend to set it.
Priority Search List	RN's search time depends on the number of frequencies it has to scan. To shorten the search time, you can select specific frequencies that are used by the nearby BNs. If no BNs are found on the configured prioritized search list, the RN will continue doing the full search on the rest of the frequencies. Note: 1. The priority search list doesn't persist across reboots.
RN Search Process	1. The RN will only search for BNs matching the configured operator ID. 2. The RN will first search for its previously connected BN (any BN the RN was previously connected to for at least 6 minutes). 3. Next, the RN will start searching all the frequencies on the "Priority Search List" (if configured). If P-BN is found (if configured), it is selected. Otherwise, the BN with the highest search metric is selected. Note: 1. Clicking on 'Search for BNs' will skip step (2) above. 2. Tarana strongly recommends clicking on 'Search for BNs' once the RN is aligned with the intended BN.
Radio States	**Searching:** The RN will scan through all frequencies and select a BN to connect to. 5 GHz frequencies for full search: 36, Typical time: 3 minutes CBRS frequencies for full search : 29, Typical time: 2.5 minutes 6 GHz frequencies for full search : 55, Typical time 4.5 minutes Note: If the search takes more than 5 minutes, check if the RN is searching for the correct operator ID, is pointed in the right direction, and that the BN is transmitting. Then, click 'Search for BNs'. **Calibrating:** The RN will tune the transmit and receive radio chains. Typical time: 2 minutes **Spectrum Authorization:** For CBRS and AFC bands, the spectrum needs to be authorized before transmission. Typical Time: 1 minute Note: 1. If the CBRS SAS responds with IAP or ICP, the spectrum authorization might take longer. 2. If CBRS grants are not authorized, check if the install parameters and the CPI-ID are inputted correctly. **Connected:** The RN has successfully connected to the selected BN and a dedicated control

	channel is assigned. Note: 1. If the total time to connect takes more than 25 minutes or if the RN does not connect within this time, please contact Tarana Support.
Alignment	During the install, the RN should be aligned in the horizontal (azimuth) and vertical (tilt) direction to maximize the performance of the link. The 'Alignment Metric' gauges the optimal aiming of the RN towards the BN. Installers must aim to maximize this metric to the highest possible value. The minimum recommended value is "10" for the alignment metric. Range - 0 to 30. Note: 1. Changing the RN tilt during alignment may have more impact than azimuth. It is recommended to uptilt in steps of 1 degree, whereas the azimuth can be adjusted in steps of 10 degrees. 2. The alignment metric is a relative metric for aligning the RN at a given location and is not an absolute indicator of performance. The value of the alignment metric could be affected by interference. 3. The actual link quality should be estimated based on the Traffic Test results, which display DL/UL SINR, pathloss, and the DL/UL throughput with latency.
Configuration	All of the configurations can also be changed/updated from TCS. If any of the above configurations are changed from TCS, the configurations made at the device will be overwritten by the TCS configuration.