DATA SHEET

G1: CHANGING MARKET DYNAMICS

Overcoming the Limitations of Traditional Fixed Wireless Access (FWA)

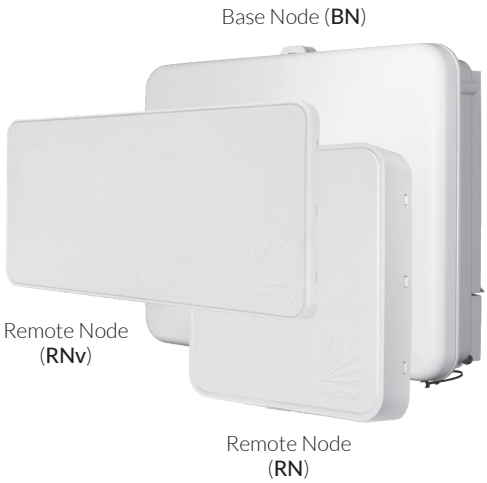
TARANA
BROADBAND REINVENTED®

Large portions of both developed and especially developing economies remain underserved in an ongoing digital divide that makes real broadband ever more urgent, as evolving modes of work, education, commerce, health care, and entertainment increase dependence on great connectivity. Copper-based fixed access networks are increasingly exhausted. Wireless alternatives continue to fail in the face of the significant technical challenges in carrier-class fixed access, including pervasive obstructions, spectrum scarcity, interference, changing conditions, and unworkable deployment models.

Tarana innovation has solved all these problems. Our Gigabit 1 platform (G1) is powered by the results of more than 10 years of focused R&D, and crafted from its custom silicon up to its cloud-based service automation with a completely fresh approach to fixed wireless. Extensively validated by tier-1 operators and well proven in carrier scale networks, our fundamental advances in multi-radio performance completely transform the economics of delivering gigabit-class access. The G1 platform features the base node (BN), remote node (RN), and Tarana Cloud Suite (TCS) for management.

- Up to 1.6 Gbps Aggregate Capacity per Link*
- Up to 3.2 Gbps Capacity per Sector*
- Up to 12.8 Gbps Capacity per Cell (4 BNs)*
- Up to 250 Clients per Sector
- Up to 1000 Clients per Cell (4 BNs)
- 5 or 6 GHz (unlicensed) or 3 GHz / CBRS (licensed)
- Works in NLoS and nLoS
- Cancels Interference
- Fiber-Class Reliability
- Fast to Deploy
- More Affordable than Fiber

*In x2 (4-carrier) mode with select 6 GHz product models

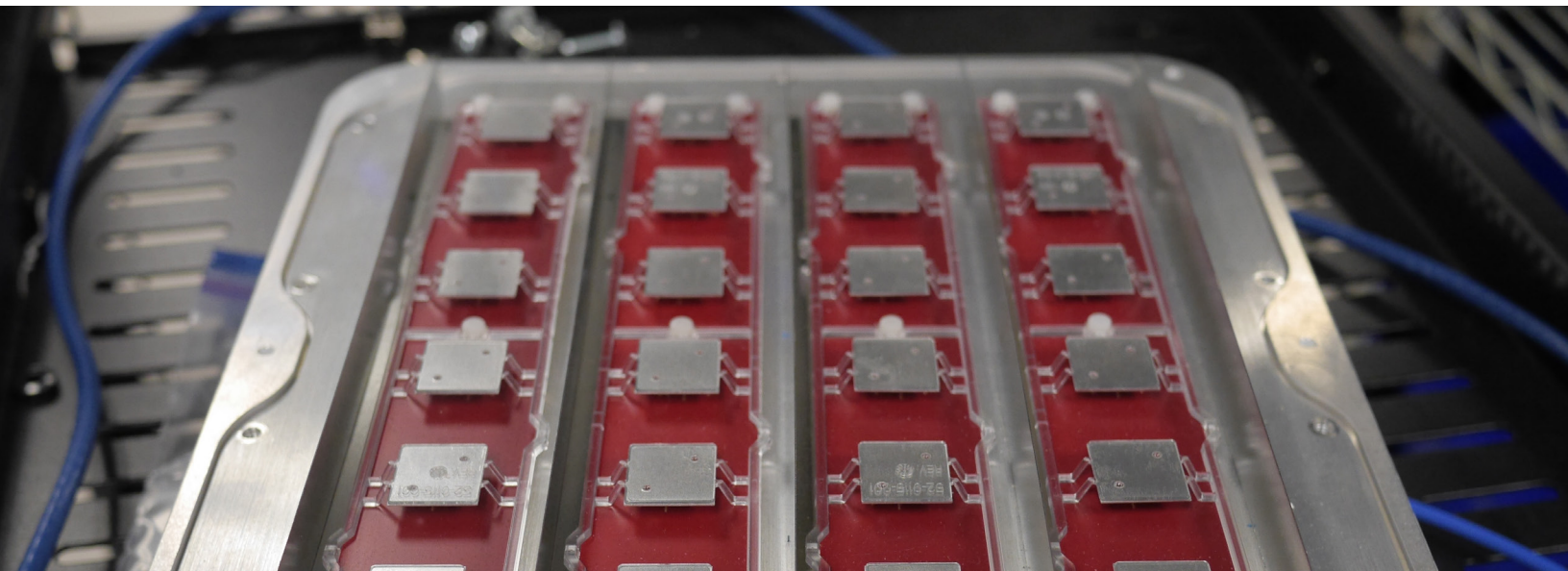


Next-Generation FWA (ngFWA)

Short for next-generation fixed wireless access, ngFWA is an entirely new technology that addresses the drawbacks of traditional fixed wireless access (FWA). Existing FWA approaches are based on technologies that fulfill their original purpose well (4G/5G for mobility and Wi-Fi for indoor networks), but are not as successful at scalable fixed access in mainstream markets. ngFWA delivers fiber-class speeds, high capacity, NLoS/nLoS capabilities, interference cancellation, quick time to market, cost efficiency, and more. To offer fast, affordable access more broadly, the industry needs this new generation of FWA to augment last-mile fiber by meeting a clear set of new requirements.

ngFWA Defined

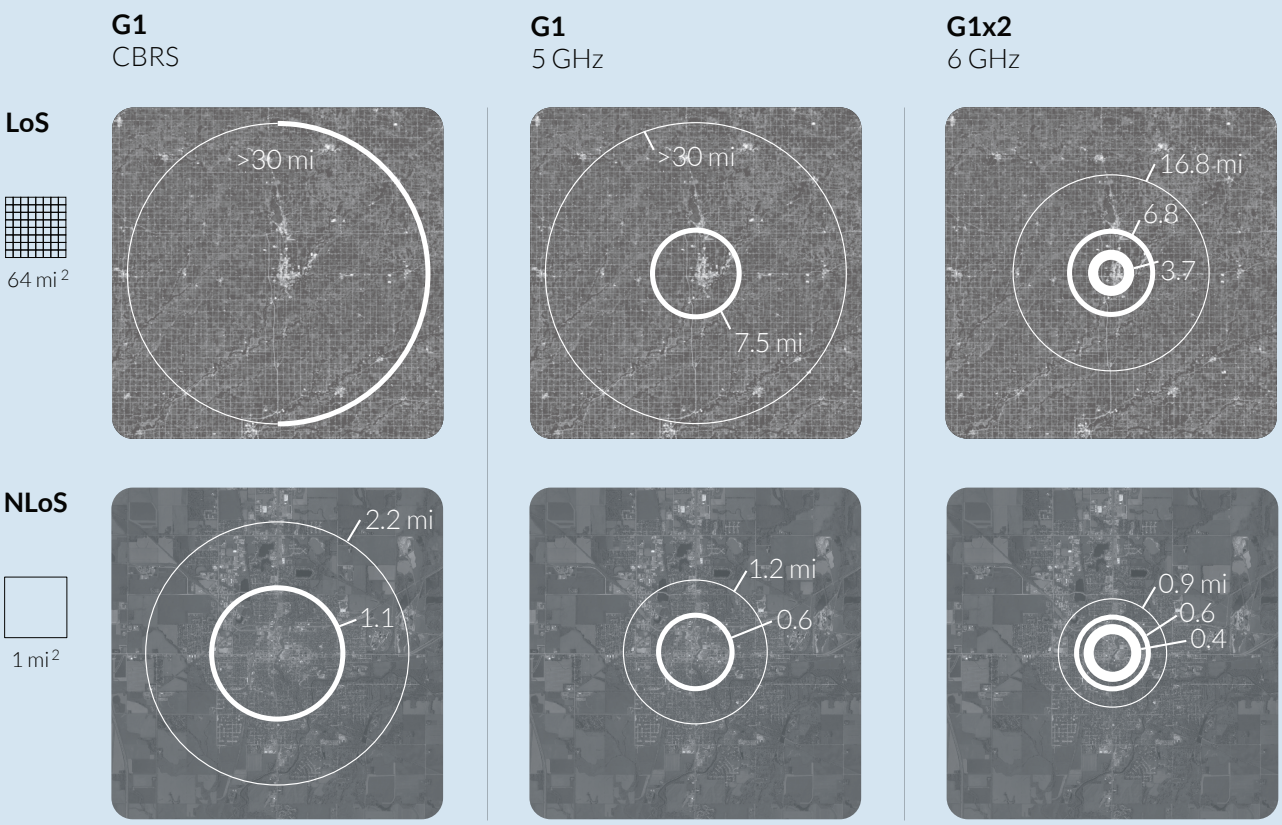
- Fiber-class (100 Mbps to 1.6 Gbps) per-household speeds and low latency at long range, with support for nearly symmetric service where desired
- High capacity per neighborhood for economically scalable deployment
- Solid connections despite obstacles in the way (like other houses, trees, and vehicles moving on the streets) and interference from other wireless networks
- Consistent service quality throughout the neighborhood, to support clean subscription plan marketing, sales, and fulfillment
- High-quality service delivery in licensed and unlicensed spectrum
- Simple installation at the home, and ideally customer self-installation



G1 and G1x2 (4-Carrier Mode) Rate and Reach Profiles

- Mason City, IA (~10k Households)
- 40 m Vertical Asset

Download Speeds
200 Mbps
500 Mbps
1 Gbps

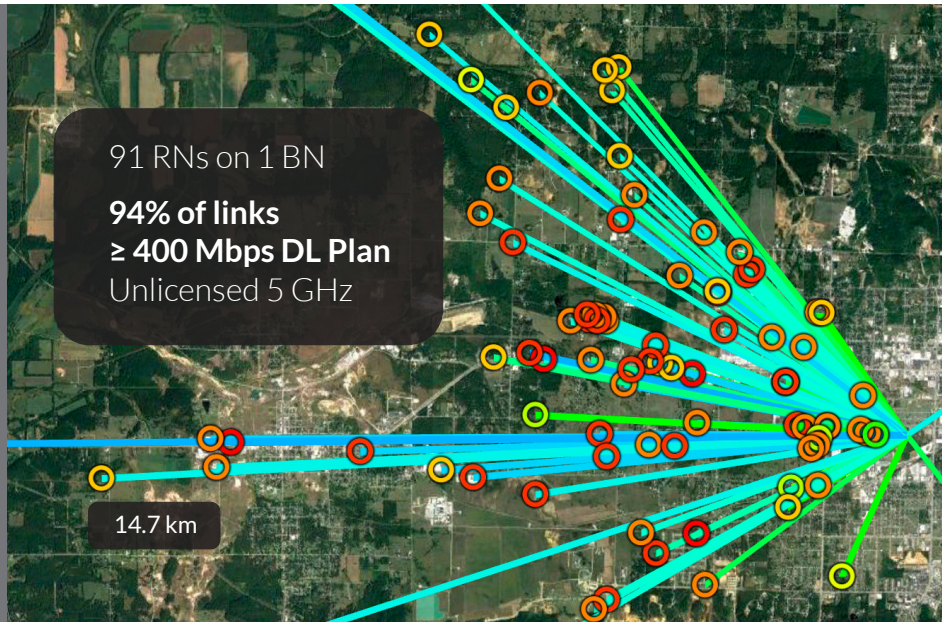


Degree of Link Obstruction

- RN Interference
- Link Interference

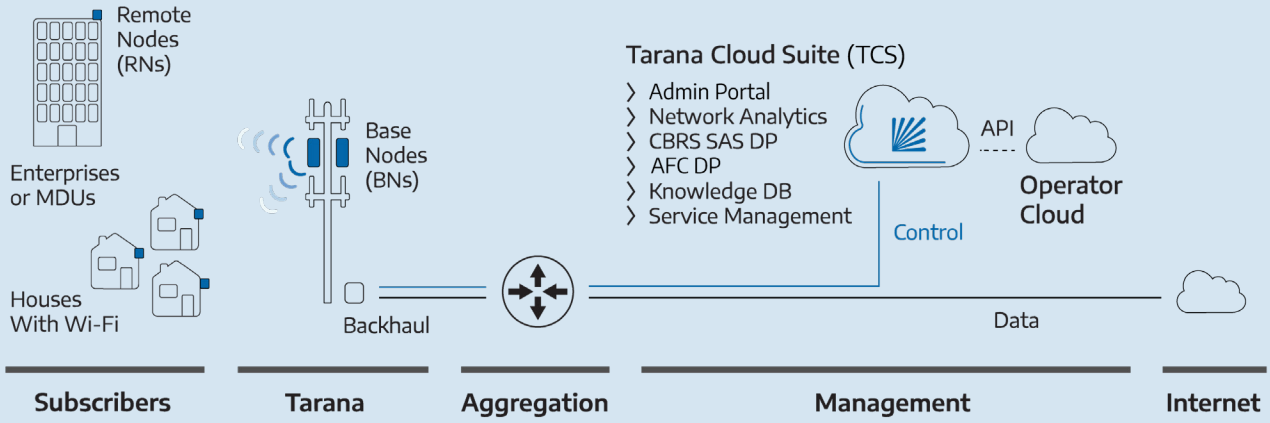
35 dB EPL
NLoS
nLoS
0 dB

As measured by Tarana Cloud Suite (TCS).



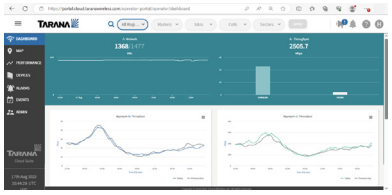
Network Architecture

Simple, Ethernet-based network architecture, supported by the Tarana Cloud Suite (TCS), enables multiple subscriber access models for highly cost-efficient residential and enterprise service.



Tarana Cloud Suite (TCS)

TCS powers efficient network planning, zero-touch provisioning, SDN management, and support automation.



Subscriber Service Activation

- API support for zero-touch deployment configuration
- Infrastructure authentication
- QoS management

Management and Maintenance

- 24 x 7 x 365 KPI monitoring and management, including historic data
- Fault logging, correction, and reporting
- Firmware & configuration management automation
- End-user login and management with role-based access

Radio and Network Planning Integration (U.S. only, requires HH data)

- Spectrum management — CBRS, SAS, and AFC domain proxy
- Coverage footprint prediction (heatmap in Google Earth)
- Capacity usage for each sector
- Cell densification analysis*

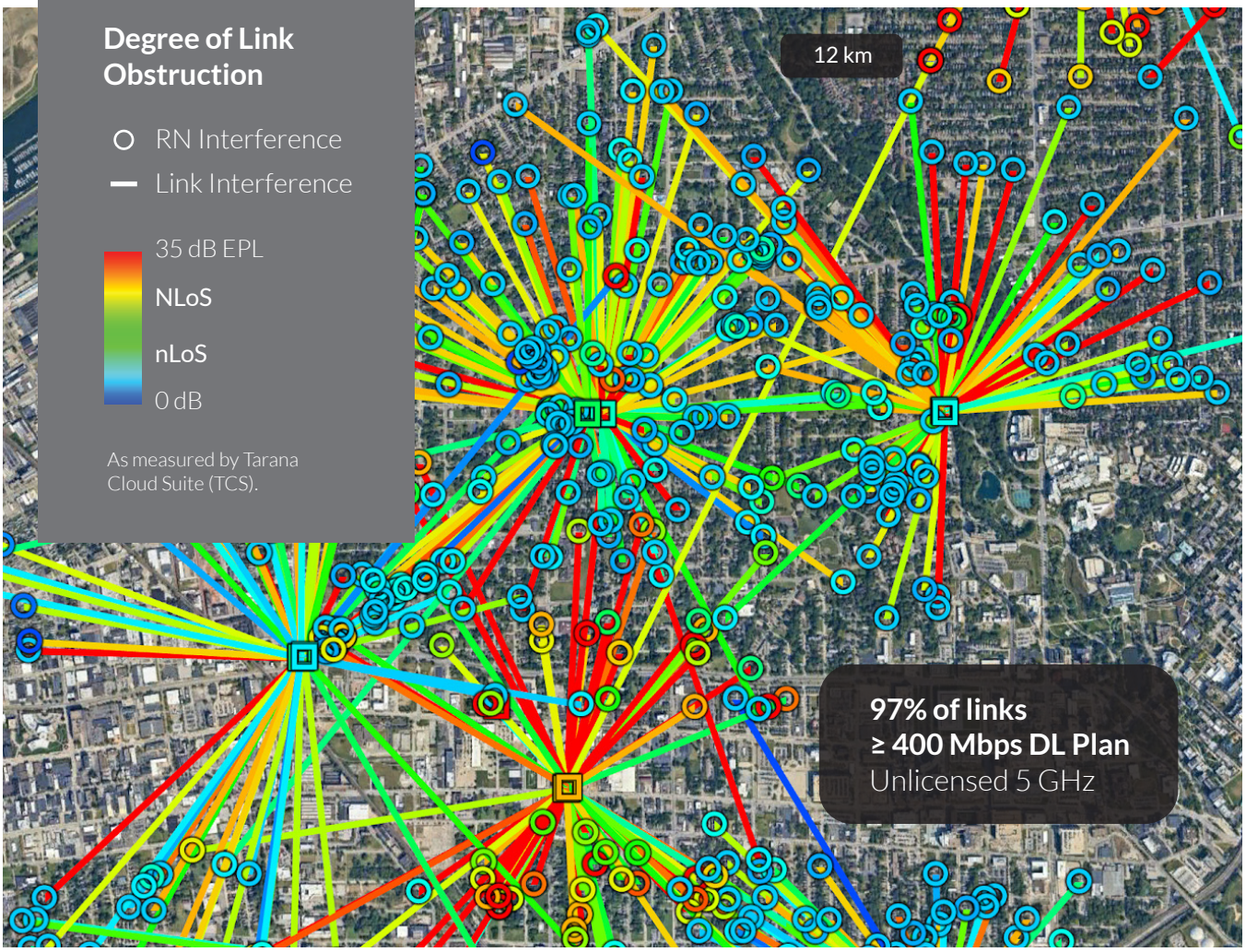
Fault Management and Network Analytics

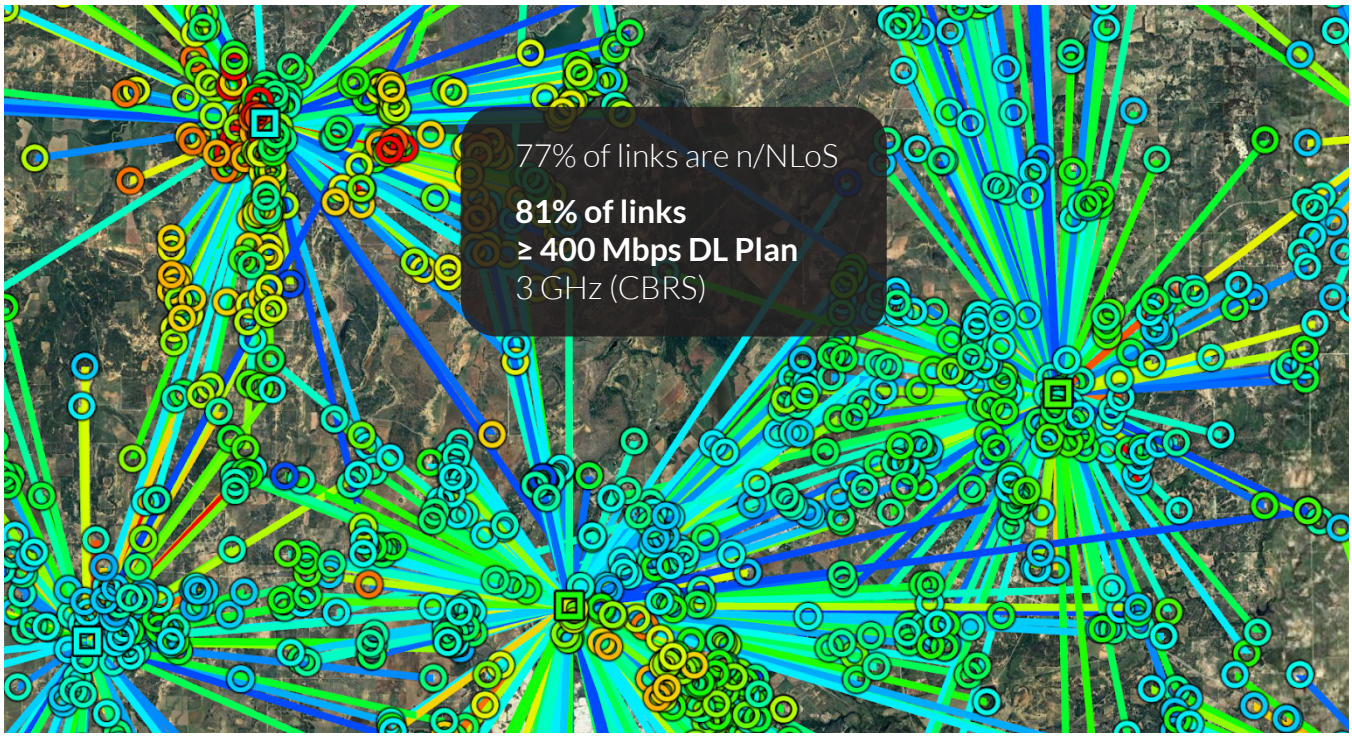
- Alarms and historic events with e-mail alerts and webhook notifications
- User-defined threshold-based alerts*
- Alarm correlation, capacity expansion, anomaly detection*

REST API for Carrier System Integration

- Device inventory, and network topology
- Subscriber provisioning and billing integration
- Geo-mapping information

*Available in future software release


Degree of Link Obstruction
RN Interference
Link Interference
35 dB EPL
NLoS
nLoS
0 dB
As measured by Tarana Cloud Suite (TCS).
12 km
97% of links
≥ 400 Mbps DL Plan
Unlicensed 5 GHz


77% of links are n/NLoS
81% of links
≥ 400 Mbps DL Plan
3 GHz (CBRS)

Specifications

General

G1 radio network platform		Base node (BN) Remote node (RN) Tarana Cloud Suite (TCS)
Topology		Scheduled, concentrated multi-point
Duplexing		TDD
Downlink/uplink ratios (configurable network-wide)		Network profile 1 (up to 15 km range) → 4.5:1 Network profile 2 (up to 30 km range) → 4:1 Network profile 5 (up to 15 km range) → 2.67:1 Network profile 6 (up to 15 km range) → 1.75:1
SLA profiles		Configurable per RN
Modulation		QPSK 1/2 to 256QAM 7.35/8 UL/DL
Spectral efficiency		30 bps/Hz per BN, up to 90 bps/Hz per band, configuration dependent
Range (full rate, frequency dependent)	NLoS (not applicable to RNv product model)	Up to 3 km (varies depending on vertical asset height, frequency band, morphology, and target cell-edge data rate)
	LoS	Up to 30 km (varies depending on vertical asset height, frequency band, morphology, and target cell-edge data rate)
Recommended frequency reuse factor		Universal frequency reuse (k=1), enabled by advanced self-interference cancellation
Beamforming		Auto-convergent, retro directive
Interference management		Self-interference cancellation, Advanced Burst Interference Cancellation (ABIC)
VLANs		Per BN or RN for user data, and management VLAN, Subscriber VLAN pass through
QoS		DSCP, VLAN 802.1p
Latency (one-way average)		<5 ms
Max Ethernet MTU		2048 bytes
Compliance		RSS-247, FCC 15E, FCC Part 96, WINNF-TS-0122
Standards and safety		IEC 62368-1, IEC 60529, IEC 60950-1, IEC 60950-22
Data plane security	RF Link Encryption	AES-128
Tarana Cloud Suite (TCS)	Scalable microservices based multi-tenant network management Zero-touch provisioning and control of radios with streaming telemetry Firmware and configuration management 24x7x365 KPI monitoring and management Fault management and historical events Network analytics SAS and AFC domain proxy Northbound Rest-API for customer and operator portal (B/OSS)	
Operating temperature range		-40°C to 55°C (-40°F to 131°F)

Remote Nodes (RNs)

	RN 3 GHz CBRS	RN 5 GHz	RN 6 GHz	RNv 6 GHz
Frequency support	3.550–3.700 GHz (US CBRS, Cat B)	5.150–5.250 GHz (UNII-1 FCC/ISED) 5.725–5.850 GHz (UNII-3 FCC/ISED) 5.850–5.895 GHz (UNII-4 FCC)**	5.725–5.850 GHz (UNII-3 FCC/ISED) 5.850–5.895 GHz (UNII-4 FCC)** 5.925–6.425 GHz (UNII-5 FCC) 6.525–6.865 GHz (UNII-7 FCC)	5.725–5.850 GHz (UNII-3 FCC/ISED) 5.850–5.895 GHz (UNII-4 FCC)** 5.925–6.425 GHz (UNII-5 FCC) 6.525–6.865 GHz (UNII-7 FCC)
Deployment Morpohology / Use Case	LoS, nLoS, NLoS (Highest range)	LoS, nLoS, NLoS (Free licensed spectrum available)	LoS, nLoS, NLoS (Gigabit speeds & largest spectrum selection)	LoS, nLoS (Value offering & largest spectrum selection)
Throughput (aggregate)	800 Mbps	800 Mbps	1.6 Gbps*	800 Mbps
Channel bandwidth	80 MHz (2 x 40 MHz)	80 MHz (2 x 40 MHz)	80 MHz (2 x 40 MHz) / 160 MHz (4 x 40 MHz)*	80 MHz (2 x 40 MHz)
MIMO streams	1x1, 2x2	1x1, 2x2	1x1, 2x2, 4x4*	1x1, 2x2
Model numbers	G1-RN3AHB012	G1-RN5AHB012 G1-RN5ASI012	G1-RN6AHB012	G1-RN6AHI042
Compatible BNs (base nodes)	CBRS	5 GHz & 6 GHz	5 & 6 GHz (only UNII-3,4 for 5 GHz)	5 & 6 GHz (only UNII-3,4 for 5 GHz)
Weight	6 lbs (2.7 kg)	4.9 lbs (2.2 kg) (G1-RN5AHB012) 6.5 lbs (2.9 kg) (G1-RN5ASI012)	5 lbs (2.3 kg)	6 lbs (2.7 kg)
Dimensions (H x W x D)	11 x 12.5 x 3.3 in (279 x 318 x 84 mm)	11.5 x 11.2 x 2.9 in (292 x 284 x 74 mm) (G1-RN5AHB012) 11 x 12.5 x 3 inches (279 x 318 x 76 mm) (G1-RN5ASI012)	10.3 x 11.3 x 2.1 in (262 x 287 x 53 mm)	17.5 x 8.7 x 2.2 in (445 x 221 x 56 mm)
Power consumption (typical at 55°C)	45 W	40 W	40 W	32 W
Power input	48V 802.3bt PoE, type 3, part #44-0027-001 or #44-0037-001 (For G1-RN5ASI012, use 48V PoE part #44-0017-001)			
Mounting	Band clamp for pole mount (1.5–2.5 inches OD); mount weights 1.2 lbs			
Form factor	Outdoor, single enclosure with fully-integrated antenna, RF, and baseband			
Antenna	Fully integrated			
Interfaces	1 Gbps Ethernet interface with PoE support, RJ45 pinout T568B			
Environmental rating	IP66			

*In x2 (4-carrier) mode with select 6 GHz product models
**Operators need to have an STA from the FCC to operate in UNII-4 (5.850–5.895 GHz)

Base Nodes (BNs)

		BN 3 GHz CBRS	BN 5 GHz	BN 6 GHz
Frequency support		3.550–3.700 GHz (US CBRS, Cat B)	5.150–5.250 GHz (UNII-1 FCC/ISED) 5.725–5.850 GHz (UNII-3 FCC/ISED) 5.850–5.895 GHz (UNII-4 FCC)**	5.725–5.850 GHz (UNII-3 FCC/ISED) 5.850–5.895 GHz (UNII-4 FCC)** 5.925–6.425 GHz (UNII-5 FCC) 6.525–6.865 GHz (UNII-7 FCC)
Throughput (aggregate PHY maximum)	Per link	800 Mbps	800 Mbps	800 Mbps / 1.6 Gbps*
	Per BN	2.4 Gbps	2.4 Gbps	2.4 Gbps / 3.2 Gbps*
	Per cell (4 BNs)	9.6 Gbps	9.6 Gbps	9.6 Gbps / 12.8 Gbps*
Maximum number of RNs	Per BN	250	250	250
	Per cell (4 BNs)	1000	1000	1000
Channel bandwidth		80 MHz (2 x 40 MHz)	80 MHz (2 x 40 MHz)	80 MHz (2 x 40 MHz) / 160 MHz (4 x 40 MHz)*
MU-MIMO streams (maximum)	Per BN	6	6	6 / 4*
	Per cell (4 BNs)	24	24	24 / 16*
Antenna		Fully integrated		
Model numbers		G1-BN3ASI001	G1-BN5ASI002	G1-BN6ASI002
Weight		42 lbs (19 kg)	42 lbs (19 kg)	42 lbs (19 kg)
Dimensions (H x W x D)		16.6 x 21.2 x 5.1 in (422 x 539 x 130 mm)	16.6 x 21.2 x 4.7 in (422 x 539 x 119 mm)	16.6 x 21.2 x 4.7 in (422 x 539 x 119 mm)
Power consumption (typical at 55°C)		275 W	275 W	275 W
Power input		-48V DC typical (-44 to -58V DC operating range)		
Mounting		Saddle clamp, band clamps for pole mount (2.375–5 inches OD); mount weighs 12 lbs		
Form factor		Outdoor micro enclosure with fully-integrated antenna, RF, and baseband; 360° coverage with 4 BNs		
Interfaces		Dual 10 Gbps SFP+ and single 1 Gbps data interfaces, additional 1 Gbps management Ethernet interface, -48V DC power		
Environmental rating		IP67		

*In x2 (4-carrier) mode with select 6 GHz product models
**Operators need to have an STA from the FCC to operate in UNII-4 (5.850–5.895 GHz)

Tarana's mission is to accelerate the deployment of fast, affordable internet access around the world. Through a decade of R&D and more than $400M of investment, the Tarana team has created a unique next-generation fixed wireless access (ngFWA) technology instantiated in its first commercial platform, Gigabit 1 (G1). It delivers a game-changing advance in broadband economics in both mainstream and underserved markets, using either licensed or unlicensed spectrum. G1 has been embraced by more than 200 operators in 23 countries and 45 states. Tarana is headquartered in Milpitas, California, with additional research and development in Pune, India.

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