

Introducing the all new LTE platform from Cambium Networks

Bringing extreme quality, necessary features, and the focus  
on fixed wireless that your network deserves.

cnRanger™

TRUST SOMEONE WHO'S BEEN THERE BEFORE

**cnRanger Introduction**



# cnRanger Portfolio





- **cnRanger 800 BBU**
- **8TX, 8RX**
- **Integrated EPC**
- **Built-in GPS**



- **3 GHz cnRanger 210 RRH**
- **Bands 42, 43, 48 (CBRS)**
- **2TX, 2RX**
- **1W per port**



- **cnRanger 201 SM**
- **2 GHz and 3 GHz options**
- **Bands 38, 40, 41**
- **Bands 42, 43 48 (CBRS)**
- **CAT6**
- **High gain dish antenna**

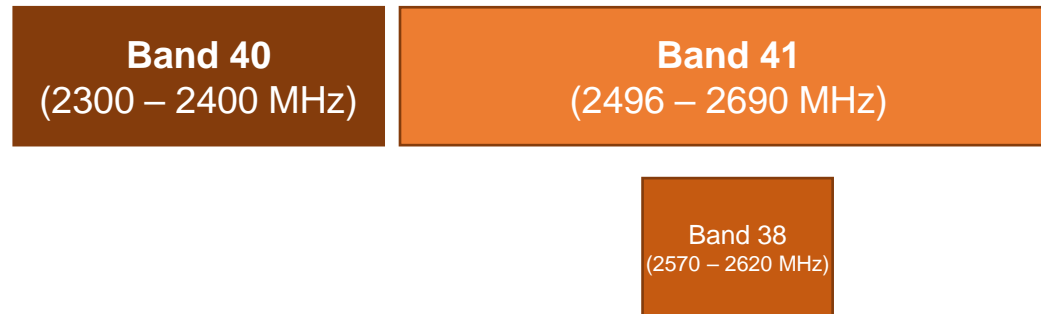


- **2 GHz cnRanger 210 RRH**
- **Bands 38, 40, 41**
- **2TX, 2RX**
- **2W per port**

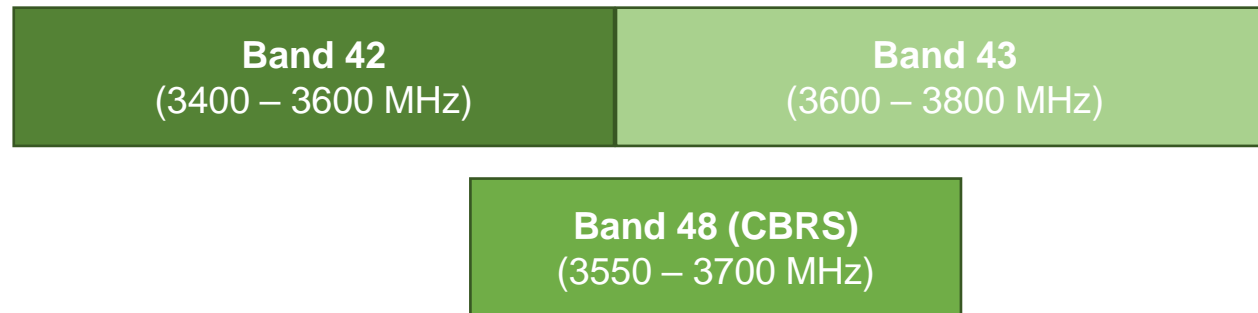


- **cnRanger 101 SM**
- **Bands 38, 40, 41**
- **CAT4**

## 2 GHz TDD Bands



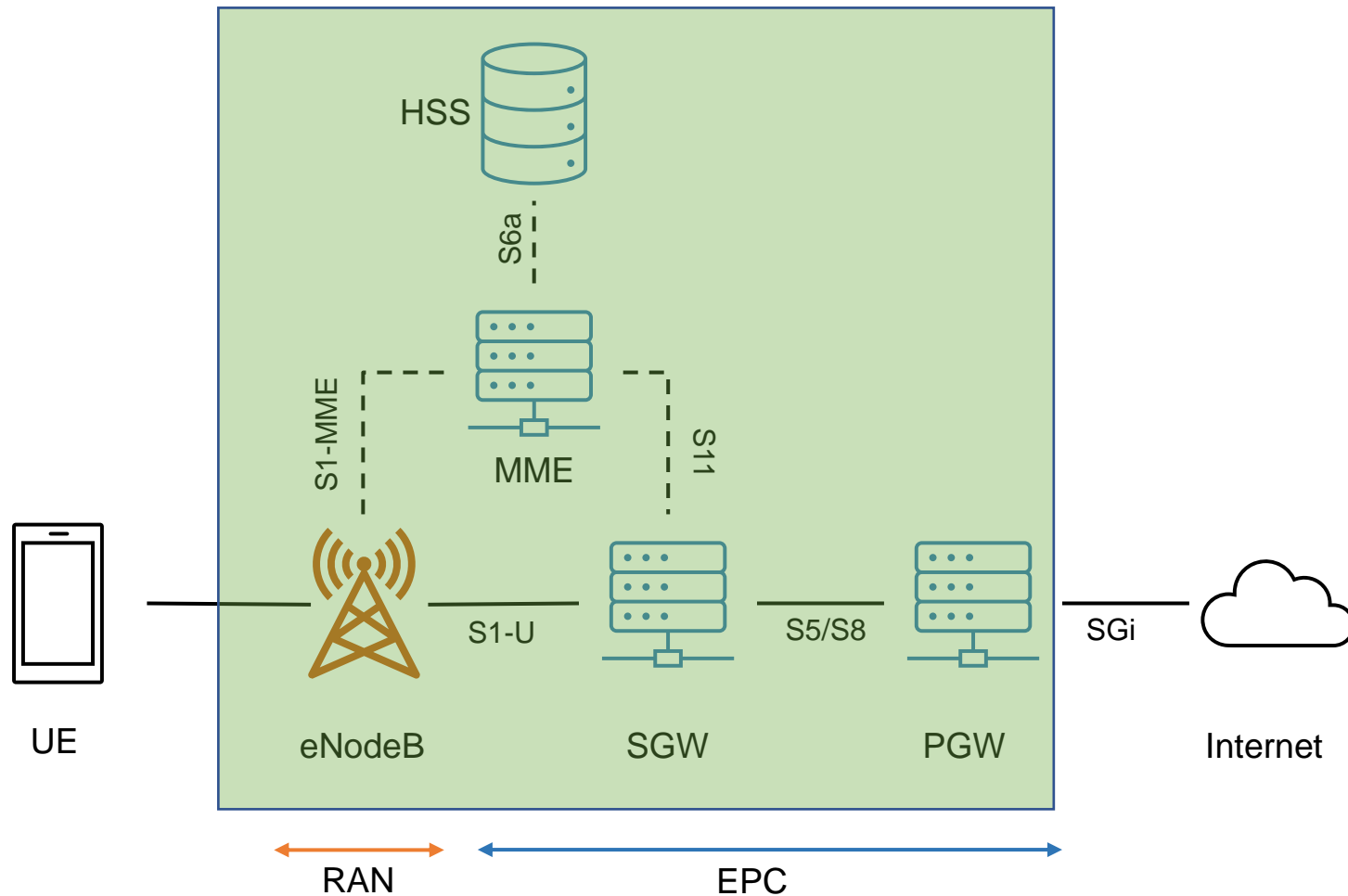
## 3 GHz TDD Bands



- 8TX, 8RX
- Up to 3 RRHs, 4 in future
- 192 SMs, 1024 in future
- Integrated EPC
- Built-in GPS
- Carrier Aggregation (Q3, 2021)
- 64 QAM downlink, 16 QAM uplink
- 19" Rack Mount
- - 48V DC



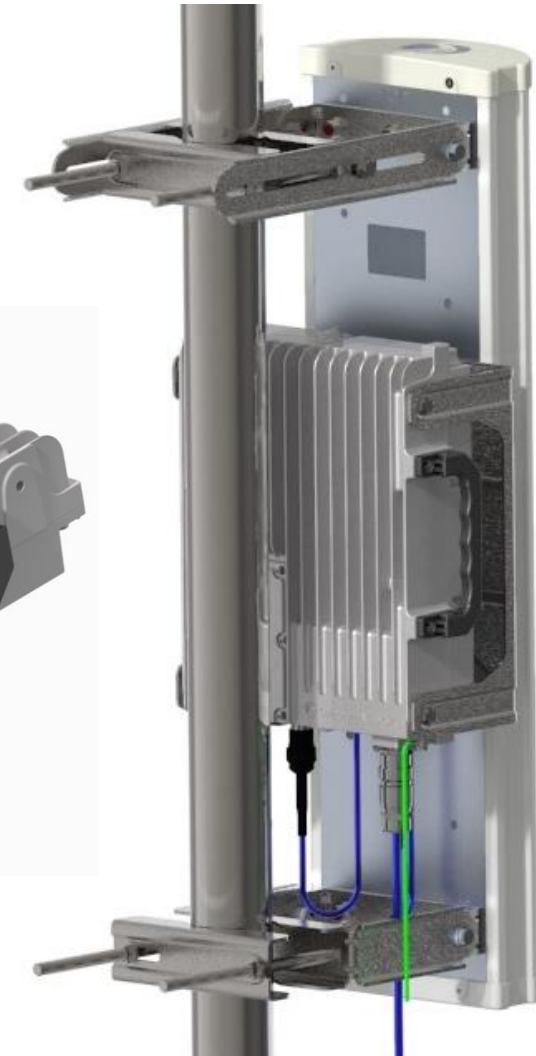
# BBU includes eNodeB and EPC



- UE – User Equipment
- MME – Mobility Management Entity
- HSS – Home subscriber server
- SGW – Serving gateway
- PGW – Packet data network gateway

# 3 GHz cnRanger 210 RRH

- LTE Bands 42, 42, 48 (3.4 – 3.8 GHz)
- 2TX, 2RX
- 1W per Port
- IP66/IP67
- 2 Carrier Aggregation (Q3, 2021)
- 10, 15, 20 MHz bandwidth
- 17 dBi Antenna
- Mount RRH on antenna
- - 48V DC



# 2 GHz cnRanger 220 RRH

- LTE Bands 38, 40, 41 (2.3 – 2.7 GHz)
- 2TX, 2RX
- 2W per Port
- IP66/IP67
- 2 Carrier Aggregation (Q3, 2021)
- 5, 10, 15, 20 MHz bandwidth
- 16 dBi Antenna
- Mount RRH on antenna
- - 48V DC





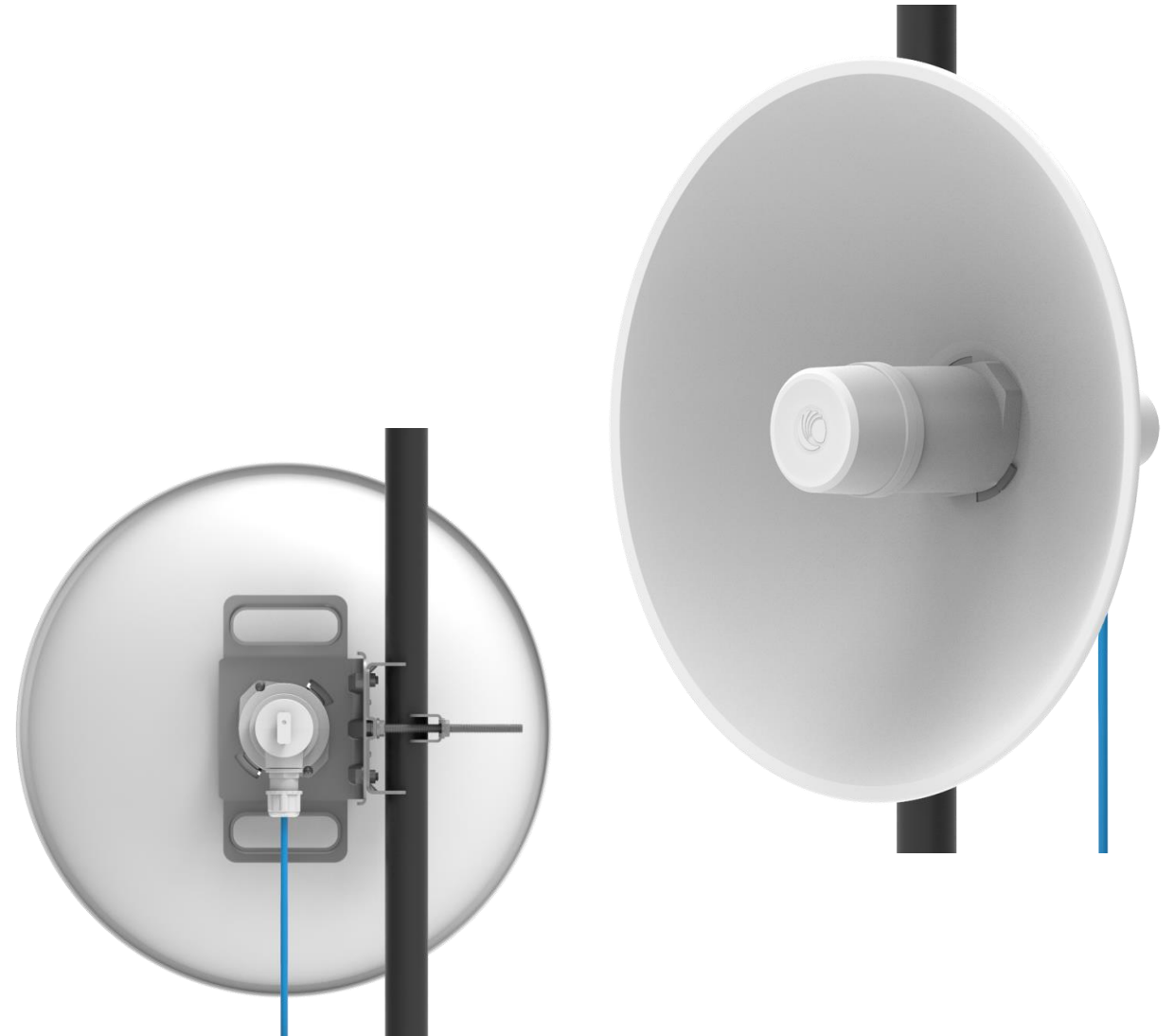
- **3 GHz SKU**

- LTE bands 42, 43, 48 (CBRS)
- 23 dBm Tx power
- 21 dBi antenna gain

- **2 GHz SKU**

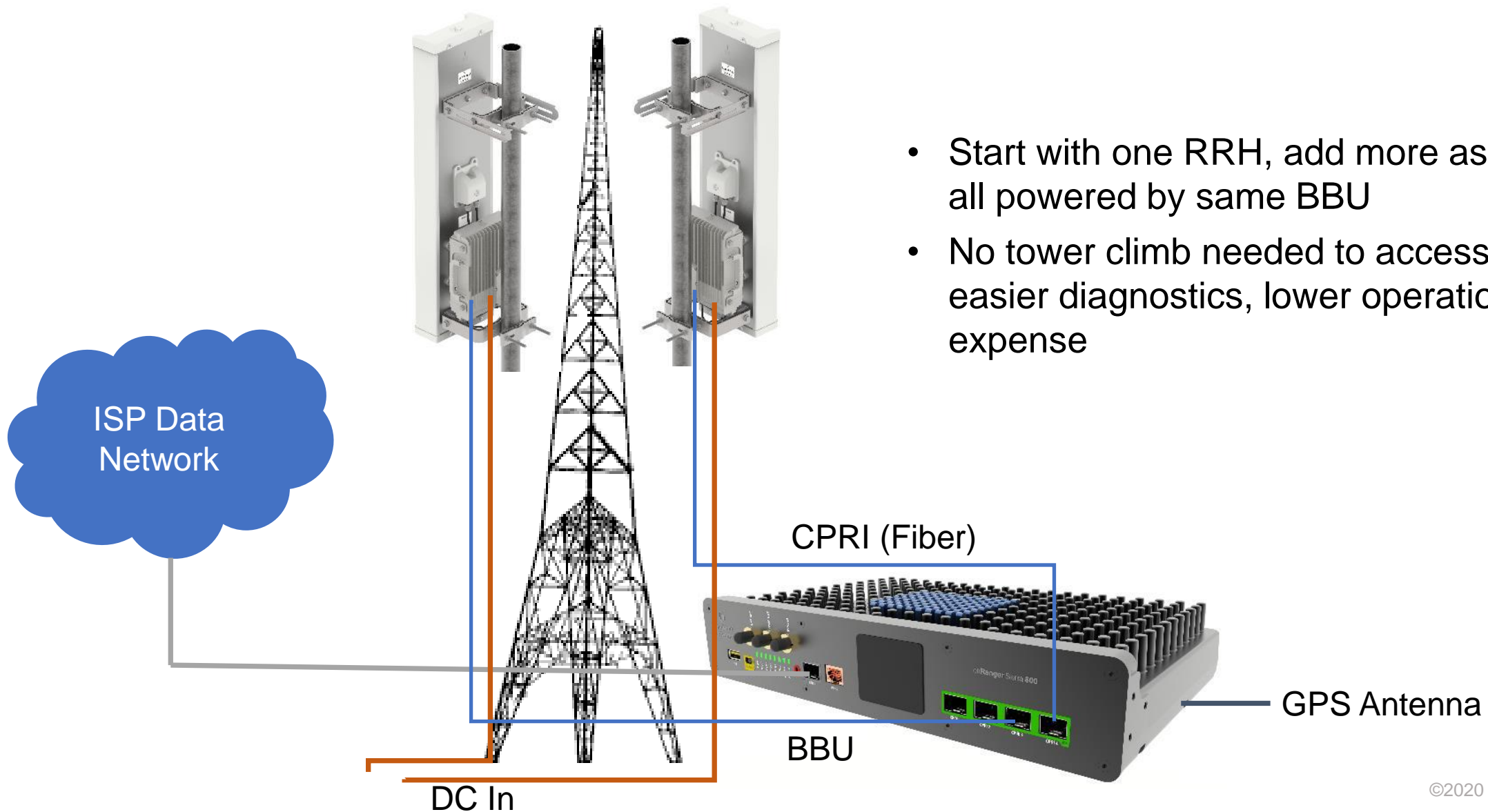
- LTE Bands 38, 40, 41
- 26 dBm Tx power
- 17.5 dBi antenna gain

- CAT 6 – 2 carrier aggregation
- 5, 10, 15, 20 MHz bandwidth support
- Up to 200 Mbps throughput
- IP67
- 30V PoE (Canopy-style)



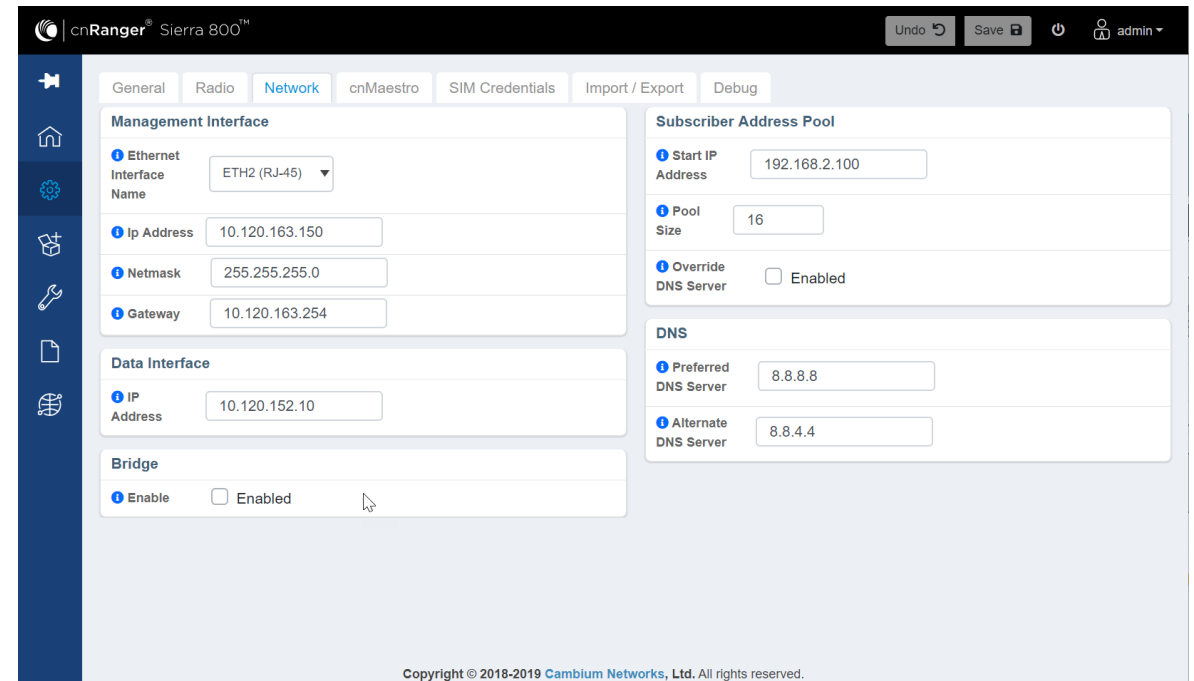
- LTE Bands 38, 40, 41 (2.3 – 2.7 GHz)
- CAT4
- 26 dBm Tx Power
- 14 dBi Integrated Antenna
- 5, 10, 15, 20 MHz bandwidth support
- Up to 100 Mbps throughput
- IP55
- 30V PoE (Canopy-style)





- Start with one RRH, add more as you grow, all powered by same BBU
- No tower climb needed to access BBU – easier diagnostics, lower operational expense

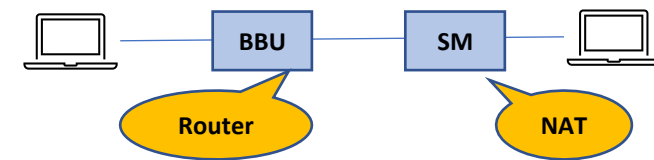
- Use familiar fixed wireless terminology and networking model – no LTE knowledge required
- Integrated EPC is automatically configured without exposing complexity



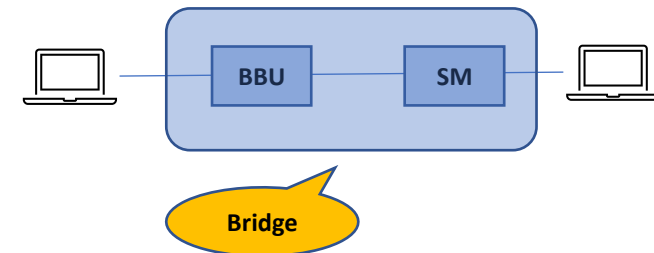


- Standard LTE is an “all IP” network, and does not support Ethernet frames
- cnRanger adds Ethernet bridging support, allowing flexible deployments

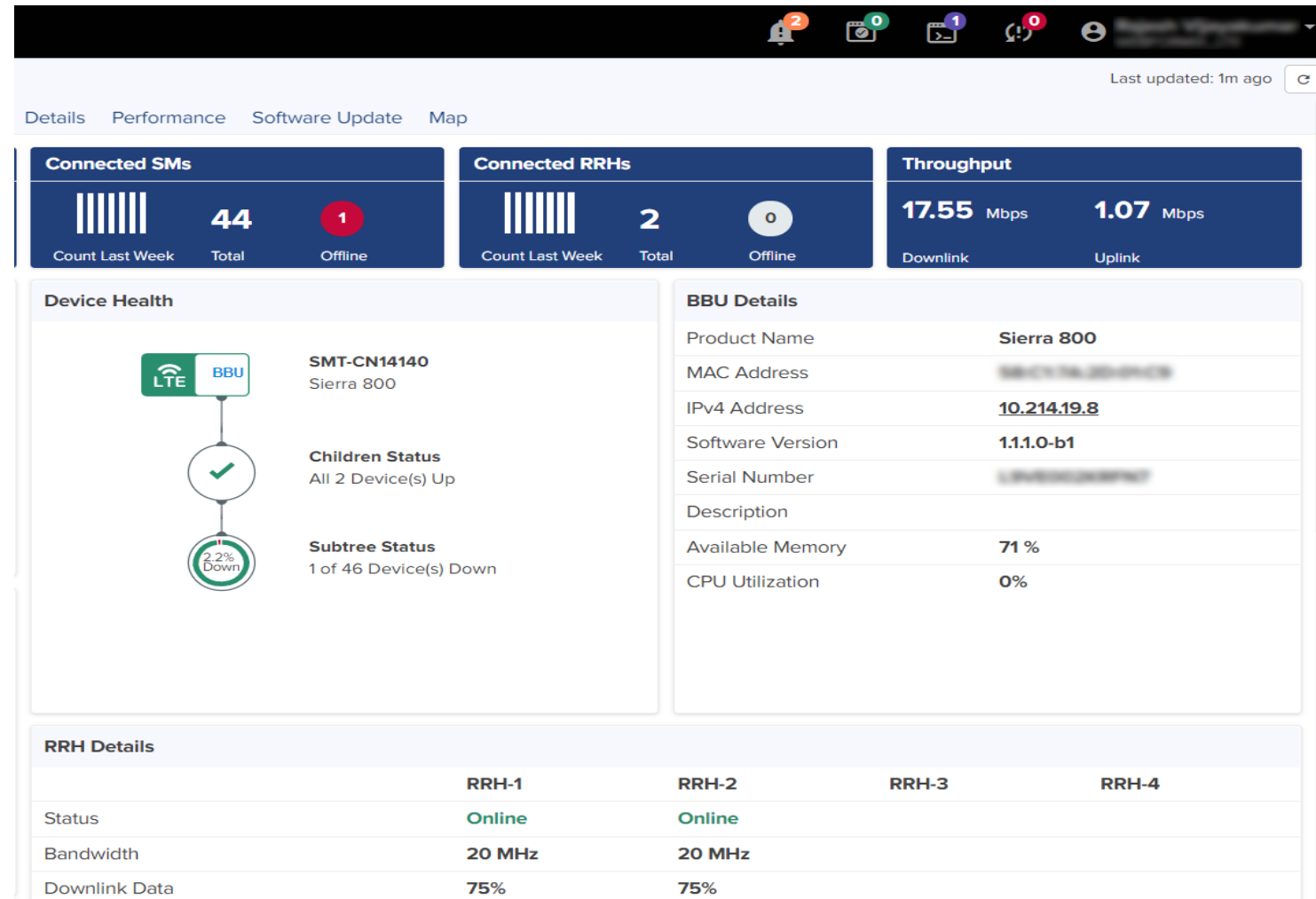
Bridge mode disabled



Bridge mode enabled



- Manage SIM credentials
- Mass firmware upgrades
- Dashboards
- Performance Monitoring
- Events and Alarms
- Domain Proxy for CBRS



The screenshot displays the cnMaestro Cloud interface with the following sections:

- Connected SMs:** 44 Total, 1 Offline.
- Connected RRHs:** 2 Total, 0 Offline.
- Throughput:** 17.55 Mbps Downlink, 1.07 Mbps Uplink.
- Device Health:** SMT-CN14140 (Sierra 800) with Children Status (All 2 Device(s) Up) and Subtree Status (1 of 46 Device(s) Down).
- BBU Details:** Product Name (Sierra 800), MAC Address, IPv4 Address (10.214.19.8), Software Version (1.1.1.0-b1), Serial Number, Description, Available Memory (71%), CPU Utilization (0%).
- RRH Details Table:**

	RRH-1	RRH-2	RRH-3	RRH-4
Status	Online	Online		
Bandwidth	20 MHz	20 MHz		
Downlink Data	75%	75%		



## • What Is It?

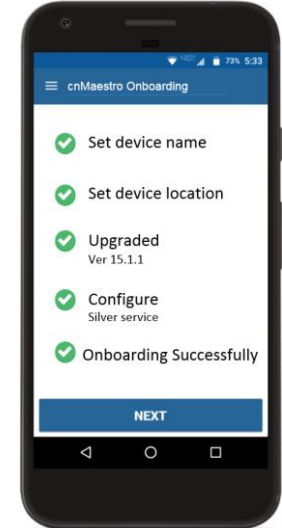
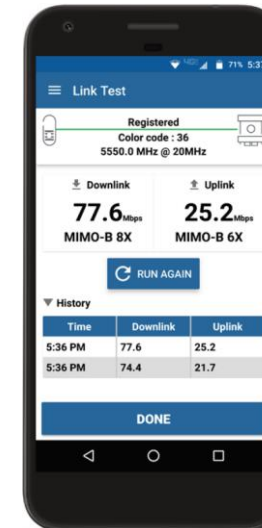
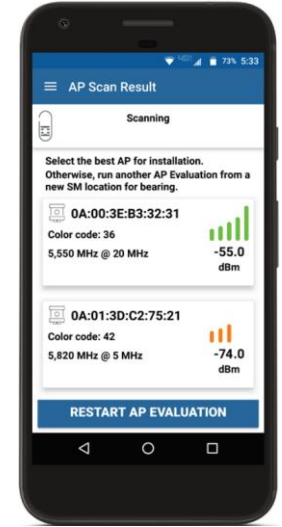
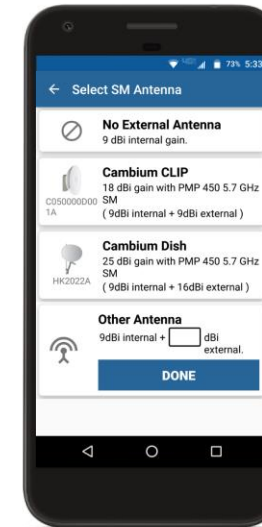
- Android and iOS App for Cambium Radios
- Supports both PMP 450, ePMP, cnRanger

## • What Does It Do?

- Pre-Configure all required parameters
- SM Alignment
- Upgrade Device Software
- Complete SM Configuration
- Record baseline performance of installed link

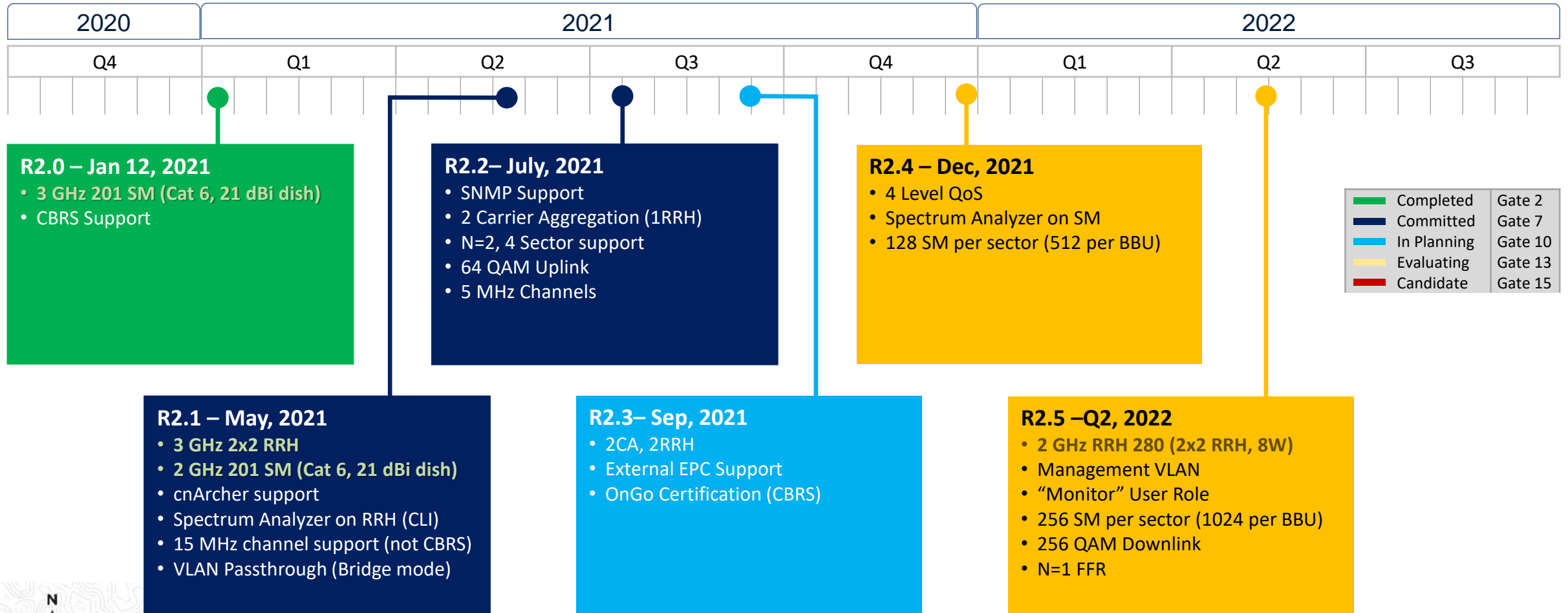
## • Why Do You Want It?

- Reduce Installation Time
- Reduce Installation Tasks
- Eliminate warehouse pre-configuration
- Eliminate Configuration/Deployment Errors
- Eliminate requirement for laptop and SM GUI



# Cambium cnRanger Plan of Intent

PLAN OF INTENT  
SUBJECT TO CHANGE  
April, 2021



**R2.0 – Jan 12, 2021**

- 3 GHz 201 SM (Cat 6, 21 dBi dish)
- CBRS Support

**R2.2– July, 2021**

- SNMP Support
- 2 Carrier Aggregation (1RRH)
- N=2, 4 Sector support
- 64 QAM Uplink
- 5 MHz Channels

**R2.4 – Dec, 2021**

- 4 Level QoS
- Spectrum Analyzer on SM
- 128 SM per sector (512 per BBU)

**R2.1 – May, 2021**

- 3 GHz 2x2 RRH
- 2 GHz 201 SM (Cat 6, 21 dBi dish)
- cnArcher support
- Spectrum Analyzer on RRH (CLI)
- 15 MHz channel support (not CBRS)
- VLAN Passthrough (Bridge mode)

**R2.3– Sep, 2021**

- 2CA, 2RRH
- External EPC Support
- OnGo Certification (CBRS)

**R2.5 –Q2, 2022**

- 2 GHz RRH 280 (2x2 RRH, 8W)
- Management VLAN
- “Monitor” User Role
- 256 SM per sector (1024 per BBU)
- 256 QAM Downlink
- N=1 FFR

Completed	Gate 2
Committed	Gate 7
In Planning	Gate 10
Evaluating	Gate 13
Candidate	Gate 15





Part Number	Description	MSRP (USD)
LTE-BBU-800	cnRanger 800 Baseband unit, 8x8	\$7,995
2LTE-RRH-220	2 GHz cnRanger 220 RRH, 2x2, 2W per port	\$3,499
2LTE-ANT-90	2 GHz cnRanger Sector Antenna – 90/120 degree, 16 dBi	\$895
3LTE-RRH-210	3 GHz cnRanger 210 RRH, 2x2, 1W per port	\$3,499
3LTE-ANT-90	cnRanger Sector Antenna – 90/120 degree, 17 dBi	\$895
2LTE-SM-101-US	2 GHz cnRanger 201 SM, CAT4, 14 dBi (US PSU and AC Line Cord)	\$219
2LTE-SM-201-US	2 GHz cnRanger 201 SM, CAT6, 20 dBi (US PSU and AC Line Cord)	\$319
3LTE-SM-201-US	3 GHz cnRanger 201 SM, CAT6, 21 dBi (US PSU and AC Line Cord)	\$319



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