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Data Sheet

NetCloud Private Networks

2023 - 12 - 05

Cradlepoint's NetCloud Private Networks (NCPN) is an end-to-end private cellular network solution designed for the needs of today's dynamic enterprise IT ecosystems. Initially based on the 4G LTE Citizens Broadband Radio Service (CBRS) spectrum in the USA, NetCloud Private Networks is a cloud-native solution packaged to make it easy for enterprises to prioritize security and Quality of Service (QoS) while also enabling plug-and-play deployments that scale with an API-first design philosophy.
NetCloud Private Networks provides an added layer of security over and above SIM-based authentication. The added layer of security is built from the ground up using zero-trust principles and is based on a granular and dynamic policy framework that is core to the architecture. The policies are applied based on the connection's context which includes network, user, device, environment, application, and cellular attributes.

Solution Architecture and Capabilities

NetCloud Interoperability

NetCloud Private Networks utilizes a unified cloud management and orchestration experience that delivers SD-WAN, enterprise-class security, cellular intelligence, and advanced analytics at the edge through full interoperability with NetCloud Manager — all managed through a single pane of glass. NetCloud Manager intelligently integrates the CBRS Spectrum Access System (SAS) to manage and prevent interference. To optimize network coverage and QoS, RF planning tools are included as part of NetCloud Manager.

Mobility Gateway

Built around a converged 4G cellular core, NetCloud Private Networks have the flexibility to be deployed on the enterprise premises, thus enabling enterprises to maintain their data locally while still benefitting from the power of cloud-based configuration and policy management. With this inherent flexibility, the NetCloud Private Networks Mobility Gateway enables secure access to enterprise data services from authenticated cellular endpoints.

Cellular Access Points

The NetCloud Private Network solution includes plug-and-play Cellular Access Points (CAPs) that support the 4G LTE CBRS spectrum band 48. Sometimes referred to as small cells, these CAPs form the private Radio Access Network (RAN) that cellular endpoints and clients connect to and are authenticated through the Mobility Gateway. CAPs rated for indoor locations (A2400) and outdoor environments (A2405) work together to create contiguous private network connectivity across the entire enterprise location.

NetCloud Private SIM-Enabled Routers and Endpoints

Notable benefits

- Implemented as an integrated system including edge to core single pane of glass visibility
- Inherent cellular-based security with unified policy management of access, network, SIM, and traffic from edge to core
- Extensibility leveraging RESTful APIs for dashboarding, custom applications, and integrations
- Leverage a large portfolio of Cradlepoint routers with features including ruggedization, Wi-Fi 6, gigabit ethernet, containers, GNSS, PoE, and more

Subscriber Identity Module (SIM) cards are critically required by every cellular network to authenticate edge devices such as cellular routers/adapters and cellular clients such as cell phones, tablets, and barcode scanners. In fact, any device that incorporates a Cradlepoint Private SIM card or Private eSIM can gain controlled access to the NetCloud Private Networks — including third-party endpoints and routers. However, to realize the benefits of a fully converged and centrally managed system, Cradlepoint CBRS routers and adapters are the preferred endpoint solution for connections to the LAN or SIM-less edge devices.

WAN Edge Router

The WAN Edge Router connects the on-premises equipment, including the Mobility Gateway and Cellular Access Points (CAPs), to the Internet and remote data centers. Depending on the deployed NetCloud Private Network architecture, the WAN Edge Router may also connect remote CAPs at a site to a centralized Mobility Gateway in a datacenter. For the best end-to-end management, policy orchestration, and user experience, this WAN Edge Router may be a Cradlepoint device, but third-party devices are also compatible with NCPN and may be a better fit for some network architectures.

Product Page

NetCloud Service

Quick Start Guide

Mobility Gateway Specifications

The Mobility Gateway is a virtual machine image that is installed on customer provided third-party hardware which meets the following system requirements.

SYSTEM REQUIREMENTS (ALL CAPACITIES)	KVM	VMware
Software Version:	Ubuntu 18.04	ESXi 6.7 or newer
Instance:	N/A	N/A
vCPUs:	8 Refer to hardware compatibility.	8 Refer to hardware compatibility.
Memory:	16 GB	16 GB
Minimum Disk Space:	24 GB	24 GB
vNICs:	4 Refer to DPDK Hardware Compatibility.	4 Refer to DPDK Hardware Compatibility.
Minimum NetCloud Private Network Release:	7.22.120	7.22.120
PERFORMANCE		
Concurrent Cellular Access Points:	Up to 100	Up to 100
Concurrent Cellular Clients:	Up to 3,000	Up to 3,000

Maximum Throughput (Subscription Options)†:	— 500 Mbps — 2 Gbps — 5 Gbps	— 500 Mbps — 2 Gbps — 5 Gbps

†Maximum throughput is bidirectional UDP traffic and assumes MTU 1500-byte packets.

SYSTEM REQUIREMENTS (ALL CAPACITIES)		
Deployment:	AWS	Azure
Software Version:	Ubuntu 18.04	Ubuntu 18.04
Instance:	c5.2xlarge	Standard_D8S_v3
vCPUs:	8	8
Memory:	16 GB	32 GB
Minimum Disk Space:	24 GB	24 GB
vNICs:	4	4
Minimum NCX Service Gateway Release:	7.23.50	7.23.60
PERFORMANCE		
Concurrent Cellular Access Points:	Up to 100	Up to 100
Concurrent Cellular Clients:	Up to 3,000	Up to 3,000
Maximum Throughput (Subscription Options)†:	— 500 Mbps — 2 Gbps — 5 Gbps	— 500 Mbps — 2 Gbps — 5 Gbps

†Maximum throughput is bidirectional UDP traffic and assumes MTU 1500-byte packets.

Cellular Access Point Specifications

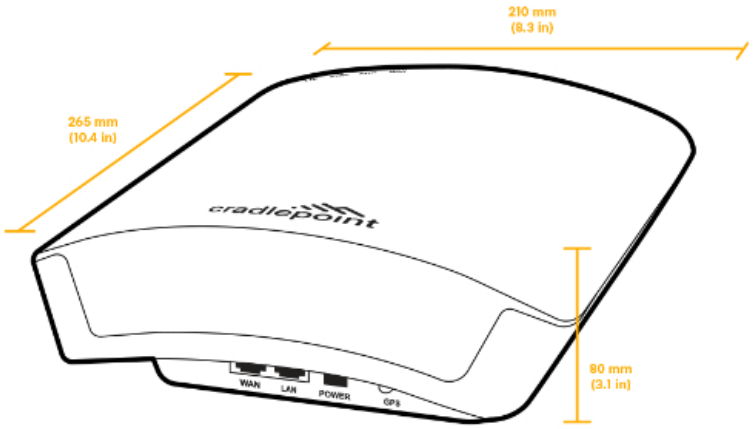
The Cellular Access Point (CAP) is a TDD-LTE small cell with integrated antennas that provides connectivity to the SIM-authenticated devices in the private network.

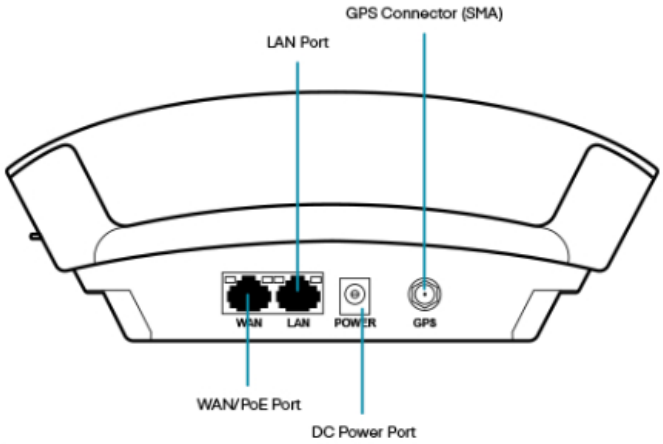
INTERFACES	A2400 (Indoor)	A2405 (Outdoor)
Ethernet:	2 x GbE	2 x GbE
GNSS / GPS:	Inbuilt with external antenna support through SMA	Inbuilt with internal antenna
ENVIRONMENTAL		
Temperature:	— Operating: -5 °C to 40 °C (23 °F to 104 °F) — Storage: -40 °C to 70 °C (-40 °F to 158 °F)	— Operating: -40 °C to 55 °C (-40 °F to 131 °F) — Storage: -40 °C to 70 °C (-40 °F to 158 °F)
Humidity:	— Operating: 5% to 90% non-condensing — Storage: 5% to 95% non-condensing	— Operating: 5% to 90% non-condensing — Storage: 5% to 95% non-condensing
Ingress Protection:	IP30	IP65

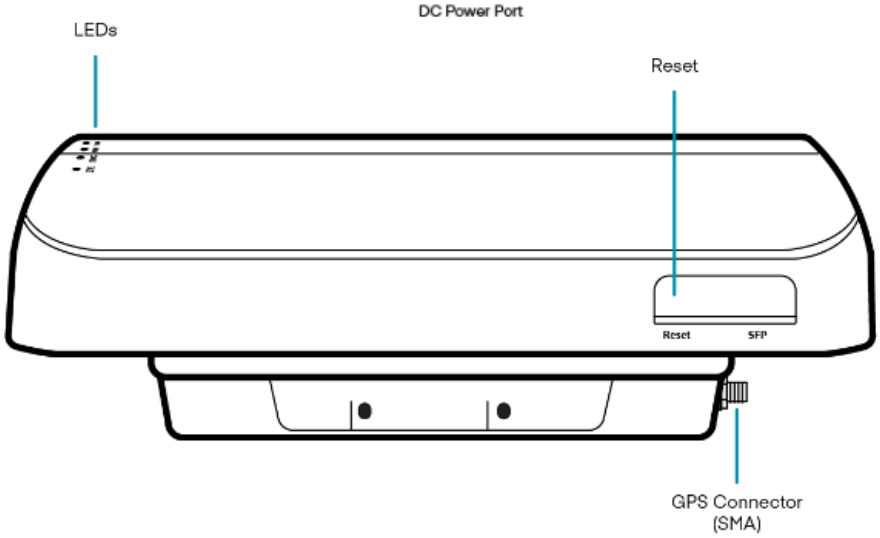
PHYSICAL		
Size:	265 mm x 210 mm x 80 mm (10.4 in x 8.3 in x 3.1 in)	410 mm x 286 mm x 115 mm (16.14 in x 11.25 in x 4.5 in)
Weight:	2.2 kg (4.9 lbs)	5.5 kg (12.1 lbs)
POWER		
Input:	One of the following: — 12 VDC constant voltage (100-240 VAC input, 12 V/2.5 A DC power adapter cable included) — PoE+ 802.3at Type 2	One of the following: — 12 VDC constant voltage — PoE+ 802.3at Type 2 (30 W max PoE+ power injector included)
Maximum Load:	21 W	21 W
RADIO SPECIFICATIONS		
Active Clients:	Up to 64	Up to 64
Peak Downlink Rates:	— Up to 110 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 2 — Up to 80 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 1	— Up to 110 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 2 — Up to 80 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 1
Peak Uplink Rates:	— Up to 14 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 2 — Up to 28 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 1	— Up to 14 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 2 — Up to 28 Mbps – based on 20 MHz BW, 64 QAM, 2 x 2, TDD config 1
Carrier Aggregation:	Up to 2CA	Up to 2CA
MIMO:	2x2	2x2
Modulation:	— Up to 64 QAM DL — Up to 64 QAM UL	— Up to 64 QAM DL — Up to 64 QAM UL
4G/LTE Bands:	B48	B48
Cellular Power:	30 dBm EIRP	40 dBm EIRP
Cellular Antennas:	4 internal (omni-directional)	4 internal (60 degree semi-directional)
Channel Bandwidth:	10, 20 MHz	10, 20 MHz

Physical Measurements & Features

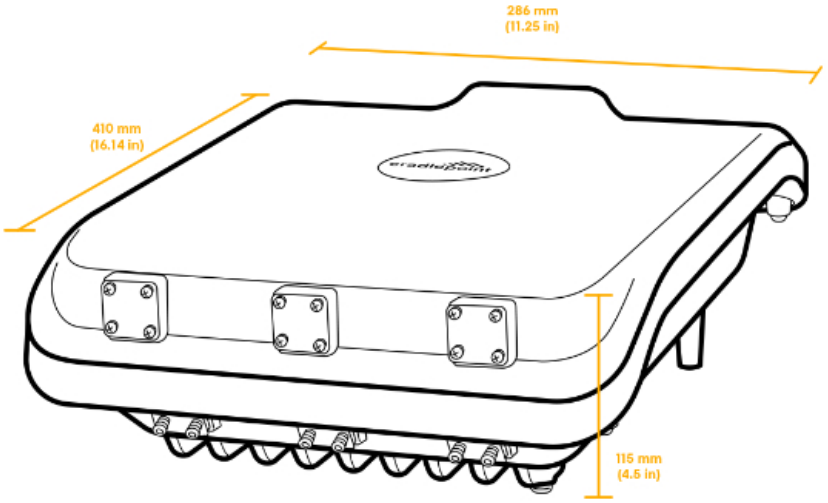
A2400

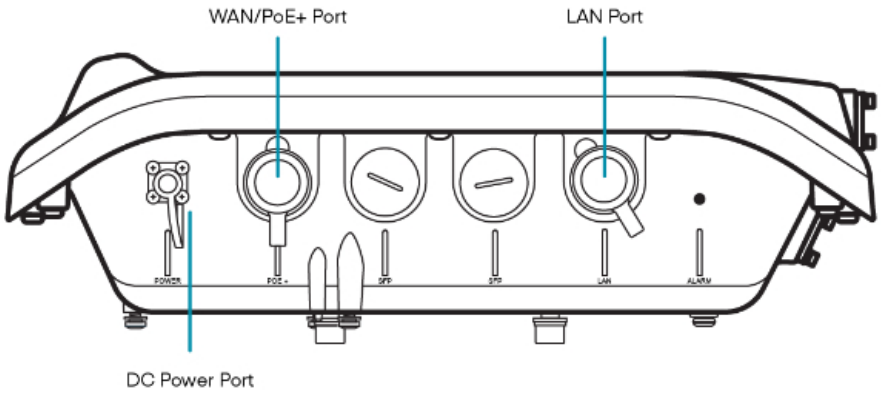






A2405



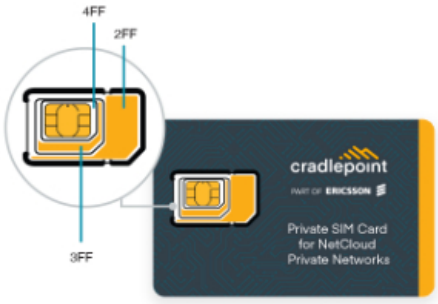


Private SIM Specifications

Private SIMs are required for each edge device that participates in the private network. SIMs for NetCloud Private Networks can be traditional physical SIMs (Private SIM) or digital eSIMs (Private eSIM). Private eSIMs can be downloaded onto a device that has consumer Embedded Universal Integrated Circuit Card (eUICC) capability (for example, an iPhone® 14 or a Google Pixel™). Once installed, Private SIMs and Private eSIMs have the same functionality and can be activated and managed from the Private SIMs page in NetCloud Manager.

PHYSICAL SIM CARD SPECIFICATIONS	
Form Factor:	Tri-cut (2FF, 3FF, 4FF)
Temperature Range:	-25 °C to 85 °C (-13 °F to 185 °F)
eSIM SPECIFICATIONS	
Edge Device Compatibility:	eUICC consumer eSIM capable

Physical SIM Card Info



Ordering Guide

NetCloud Private Networks is comprised of a Mobility Gateway, Cellular Access Point(s), and Private SIMs which all have corresponding NetCloud Service plans. For a complete end-to-end management solution, Cradlepoint routers and adapters should be added to the system. For details on NCPN features, refer to the summary on the NetCloud Service webpage and the detail in the NetCloud Service Features document. For more details on how to order NetCloud Private Networks, refer to the following:

Step 1: Select NCPN **Mobility Gateway** capacity for entire solution

Step 2: Select NCPN **Cellular Access Point(s)** (selection of one or more indoor/outdoor models)

Step 3: Select NCPN **Private SIMs** for connected endpoints (selection of one or more Plastic or Digital SIMs)

Step 4 (optional): Select supported **Cradlepoint CBRS endpoints**

Step 5 (optional): Select compatible **Cradlepoint WAN edge router**

STEPS	COMPONENT	DESCRIPTION
1	Mobility Gateway	— 500 Mbps throughput — 2 Gbps throughput — 5 Gbps throughput
2	Cellular Access Point(s)	— A2400 Indoor Cellular Access Point — A2405 Outdoor Cellular Access Point
3	Private SIMs — Plastic Private eSIMs — Digital	— Packs of 10 — Single eSIM

4 (optional)	Cradlepoint CBRS endpoints	— R500-PLTE Series Ruggedized Router — IBR1700 Series Ruggedized Router — R920 Series Ruggedized Router — R1900 Series 5G Ruggedized Router — R2100 Series 5G Ruggedized Router — E100 Series Enterprise Router — E300 Series Enterprise Router — E3000 Series Enterprise Router — L950 Series LTE Adapter — W1850 Series 5G Wideband Adapter — W2005 Series 5G Wideband Adapter — W4005 Series 5G Wideband Adapter
5 (optional)	Cradlepoint WAN edge router	— E100 Series Enterprise Router — E300 Series Enterprise Router — E3000 Series Enterprise Router — R1900 Series 5G Ruggedized Router

NetCloud Service Plans

REGION	NCPN PACKAGE PLAN	DESCRIPTION†	PART NUMBER
U.S. only:	Mobility Gateway (self-hosted virtual appliance)	PROMO — 500 Mbps PROMO — 2 Gbps PROMO — 5 Gbps	NCPN-000y-MG500MBPS NCPN-000y-MG2GBPS NCPN-000y-MG5GBPS
	SIM Management for Plastic SIMs	PROMO — Private SIMs (10 pack)	SA0y-SIM10-CB
	SIM Management for Digital eSIMs	Private eSIM (1 eSIM)	SA0x-SIM-DIGITAL-CB
	CBRS Cellular Access Points — Essentials	PROMO — Indoor A2400 CAP with AC power supply and line cord PROMO — Outdoor A2405 CAP with PoE injector and line cord	PA0y-2400NM-CN PB0y-2405NM-CC
	Renewal — Mobility Gateway	500 Mbps — 1 year	NCPN-0001-MG500MBPS-R
	Renewal — Cellular Access Point	Indoor — 1 year Outdoor — 1 year	PA01-NCESS-R PB01-NCESS-R
	Renewal — SIM Management for Plastic SIMs	Private SIMs (10 pack) — 1 year	SA01-NCPNSIM10-R
	Renewal — SIM Management for Digital eSIMs	Private eSIM (1 eSIM) — 1 year	SA01-NCPNSIM-DIGITAL-R

x = 3 or 5 years
y = 4 or 6 years
†PROMO SKUs (promotional SKUs) are available for a limited time and add an extra year to the standard 3 or 5-year NetCloud Service Plan. Starting 01/01/2024, new subscriptions revert to the standard 3 or 5-year NetCloud Service Plan. All renewals have a 1-year duration.

Support & Warranty

All NCPN hardware and software are sold as part of a NetCloud Service package, which includes:

- Cradlepoint Global Support for the full subscription term.
- Hardware limited lifetime warranty for as long as they have a subscription license to an active NetCloud Service Plan.

More Information

Learn more at cradlepoint.com/netcloud-private-networks