




RFP No 25-190

City and Borough of Juneau



www.northriverit.com

December 19, 2024





Transmittal Letter

RFP No 25-190 - Provision of Internet Services in the Juneau Maritime Industry Zone for the CBJ
North River IT Services Co.

Physical Address:

302 Gold Street
Juneau, AK 99801

Mailing Address:

PO Box 3027
Bismarck, ND 58502

Phone: 701-751-2341

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<https://www.northriverit.com>

Responsible Person for Contracts and Binding Authority:

Charles (Chaz) Hager – CEO (Additional Contacts in the Resumes Section).

701-390-9077

chaz.hager@northriverit.com

Signature:

A handwritten signature in black ink, appearing to be "CHAZ HAGER", written over a light blue horizontal line.

Northriver IT acknowledges all addenda published by CBJ and all accepted required addendums were accepted via the online Public Purchase platform.

The City and Borough of Juneau (CBJ) is trying to solve Internet connectivity challenges and congestion in the downtown maritime industry zone (MIZ). Residents and visitors are frequently unable to use their respective mobile devices while in the zone due to capacity and congestion in the area. Following the evaluation of this proposal CBJ will determine that Northriver IT is the most highly qualified partner for the provision of free public downtown Wi-Fi Internet Services in the Juneau MIZ. This will promote a more enjoyable Juneau traveler experience as requested in the RFP.

Northriver IT (NRIT) was founded in 2007 by Chaz Hager, its CEO. Starting in 2010, Northriver IT expanded into Alaska by working with the Kodiak Island Borough School District. Since that time Northriver IT has found success with several state and local entities (SLED) throughout Alaska including the migration of the City and Borough of Juneau to Microsoft 365. In September, Northriver IT opened its first local office in Juneau and is proud to have a local office!



Northriver IT will combine our experienced staff, strategic vendor relationships, and key subcontractor partners to ensure the project is completed successfully. An outline of our key relationships is featured below:

1. Northriver IT Staff. The resumes of our staff and their respective expertise are included in the appendix of our response.
2. Cambium Networks (wireless vendor). Our chosen vendor partner to provide the wireless backhaul and associated client Wi-Fi has certified the submitted design.
3. Frontera Consulting (subcontractor). Frontera specializes in outdoor, public Wi-Fi design and deployment. **Frontera will have local resources present to manage and ensure the system is installed in accordance with their design.** *Please note Frontera has updated the design that was part of the comprehensive frequency study.* *See references in Appendix.
[Frontera Consulting – Connecting Communities](#)
4. LinkUp Alaska (subcontractor). This is the local tower and wireless contractor that will be responsible for the physical installation, placement, and *ongoing maintenance/upgrades* of the equipment. *See references in Appendix. [LinkUp LLC - Pacific NW Telecom Construction](#)
5. Juneau School District. Through our partnership with the Juneau School District, career and technical education (CTE) students will gain hands-on experience by assembling masts, providing dock support, and ultimately gaining employment through this project. *See project sample pictures in the Appendix.



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Revised Design Overview:

Pictured below is the overview of all wireless backhaul locations serving MIZ Zone A & B. The original comprehensive RF study was missing part of Zone B. The updated design now has Wi-Fi coverage throughout all of Zone A & B of the MIZ.





Understanding & Methodology:

Technology Solution Details:

1. The design relies on City Hall as the central demarcation point as ACS our chosen carrier was able to commit to a 60-day or less activation of Internet service. *Thankfully the flexibility within the wireless mesh (self-healing) design will allow us to enter the mesh at any location. Upon award NRIT will work with CBJ to find the **most desirable location** where Internet service can be activated in a timely manner. Due to the possibility of a relocation of City Hall ([New City Hall – CBJ](#)) NRIT will agree to a one-time, relocation of the demarcation to a mutually agreeable location between NRIT, CBJ, and ACS.
2. The Internet bandwidth and associated equipment are entirely separate from all city networks. There is **no dependency** on city networks for this solution to be successful.
3. With agreement from CBJ City Hall will house the key uninterruptable power supplies (UPS), Internet gateway devices (firewalls), filtering appliances, and core network. *This can be adjusted to a mutually agreeable location as stated above.
4. It is believed CBJ has roof access rights at the Marine Way building. The updated design relies on this location as a wireless distribution center hub location. If facilities allow and ACS can deliver the same service into Marine Way, it is possible to use this as the demarcation point. Alternatively, IF Marine Way roof access rights are not available the library can still be used. The fiber Internet activation may not be guaranteed in 60 days.
5. Following review with AEL&P none of the proposed light poles are owned by AEL&P. NRIT has agreement to use poles from AEL&P if poles owned by AEL&P become a requirement.
6. Based on cruise ship numbers and expected usage, the service is expected to guarantee a minimum of 500Kbps - 1Mbps of bandwidth per client under **peak load**. Per the FCC bandwidth table this is adequate for general Internet access as requested by CBJ ([Broadband Speed Guide | Federal Communications Commission](#)). System backhaul latency is 1-3ms. Under normal operating conditions the end-user will consistently fall under the desired maximum of 70ms of latency.



7. Our solution design has a clear, immediate path to add 10Gbps of aggregate bandwidth. This is done by activating an additional circuit with our provider ACS. This would be an additional cost of \$10,000/month.
8. Wireless equipment on poles will be powered from a box manufactured by Solis. The Solis box taps into the respective light poles and for key distribution nodes includes a **built-in uninterruptable power supply** (UPS).
9. ALL wireless backhaul will be via Cambium Networks cnWave 60GHz, with self-healing capabilities and redundancy built throughout the design.
10. Outdoor Wi-Fi Access Points include a software-defined radio that can be deployed using a mix of 2.4GHz, dual 5GHz and the capability of 6GHz (6E). Our reporting and analytics can determine the amount of 6GHz (6E) capable clients to assist in the best use of spectrum.
11. Filtering is a consideration throughout the entire solution; every access point can filter OSI layers 3 through 7. Our chosen Internet filtering method is DNSFilter installed on an appliance at the gateway, DNSFilter specializes in public Wi-Fi filtering ([From 4G to 5G: Security Concerns and Public Wi-Fi | DNSFilter](#)) and is in production at Juneau School District. This service enables category filtering, reporting, and allows NRIT to place a local DNS appliance for the *most efficient DNS query response times*. Solutions lacking local DNS at the expected density will result in unnecessary latency and slower response times. The redundant firewalls installed in high availability can provide full traffic visibility, shaping, and maximize the end-user experience.
12. The service will exit redundant Internet gateway devices dedicated for this purpose. Installed in high availability (HA) the devices are rated for 39Gbps throughput to provide scalability. The Fortinet devices support 11 million concurrent TCP sessions and 400,000 new sessions/second.
13. SignalRoam is industry-proven for automatic cellular handover/offload (aka. PassPoint / HotSpot 2.0) that is seamlessly integrated into Cambium Networks equipment and *included with our solution*. All compatible cellular carriers will be supported for cellular offload. Based on the data provided in the comprehensive RF study regarding end-user device types, we expect greater than 75% of all visitors in the MIZ to connect *automatically* without any end-user configuration on their personal devices. More information: [SignalRoam](#).



14. ALL proposed equipment uses industry standard protocols and meets the latest security standards. Each piece of equipment will be managed from a centralized cloud portal and the ability to manage firmware/software upgrades and configuration changes throughout the entire system.
15. NRIT will retain ownership of the equipment and be responsible for **all** maintenance (physical and virtual), installation, and repair of the system. This is a complete solution.
16. As outlined in the appendix the management solution (cnMaestro X) possesses the software utilities to administer and manage user sessions, as well as the ability to manage captive portal pages. This platform can set connection time limits and will assist in maintaining network use integrity.
17. The network management capabilities include the ability to anonymously track, monitor, and analyze system performance. These metrics will drive system improvement.
18. The system can accommodate network scheduling based on the requirements of CBJ.
19. Upon agreement from CBJ NRIT will provide Wi-Fi signage that is like "No Parking" signs affixed to light poles as approved to CBJ.
20. Business Personal Property (BPP). The City and Borough of Juneau will be responsible for any assessed or required Business Personal Property tax.
21. Pricing is presented annually and all-inclusive of equipment, filtering, support, bandwidth, and installation services.
22. Each year the price will increase no more than 3% until contract termination.

Operational Plan:

1. The local NRIT office at 302 Gold Street will be the headquarters location for the installation of the solution. This downtown location is where all equipment will be staged and provisioned before being sent into the field.
2. Our local office will be set up with assembly stations including the hardware and masts to pre-assemble prior to installation on the designated roof or light pole. *Pictures of similar projects in the appendix.



3. Our local project manager will be responsible for coordinating and directing all resources in and subcontractors to complete their respective tasks and scope of work as outlined in the technology solution.
4. Frontera Consulting has extensive project management and implementation experience as outlined in the experience qualifications section. Frontera will work in conjunction with our local project manager and other local resources to ensure success throughout the project.
5. The solution timeline includes *pre-cruise activation* and stress testing to ensure real-world information is available in advance of the 2025 cruise ship season!
6. Wi-Fi Coaches. To ensure public success NRIT will rely on multiple "Wi-Fi Coaches" to be on the ground assisting the public in the first year of the deployment. This will ensure that residents and visitors have a seamless experience and allow NRIT to be hyper-proactive to any identified or known issues captured in real-time from experiences "on the ground". To provide community involvement and real-world experience, NRIT is excited to partner and deliver this valuable experience, with Juneau School District (JSD) students as an internship/learning/employment opportunity. JSD has been a network managed services customer of NRIT for over 5 years, and we are excited to offer this unique asset to the proposal that we feel will be a pillar of the success in the post deployment of this solution. Our staff have been part of the Wi-Fi coach concept in other deployments such as the Extreme Networks NFL end user experience. We plan to model this experience after the stadiums because of the high density and end user technical capabilities. If you would like to know more about what a Wi-Fi coach is and what do they do, please see the appendix.

Management Plan

- NRIT will comply with all applicable Federal, State, and City laws.
- Below is an organization chart illustrating the authority and relationship between our project manager, internal resources, and associated subcontractor partners. The resources will be managed through our Professional Services Automation platform known as ConnectWise Manage. This management platform promotes accountability by including all phases, deliverables, and detailed tracking of associated work. NRIT will meet with CBJ on a

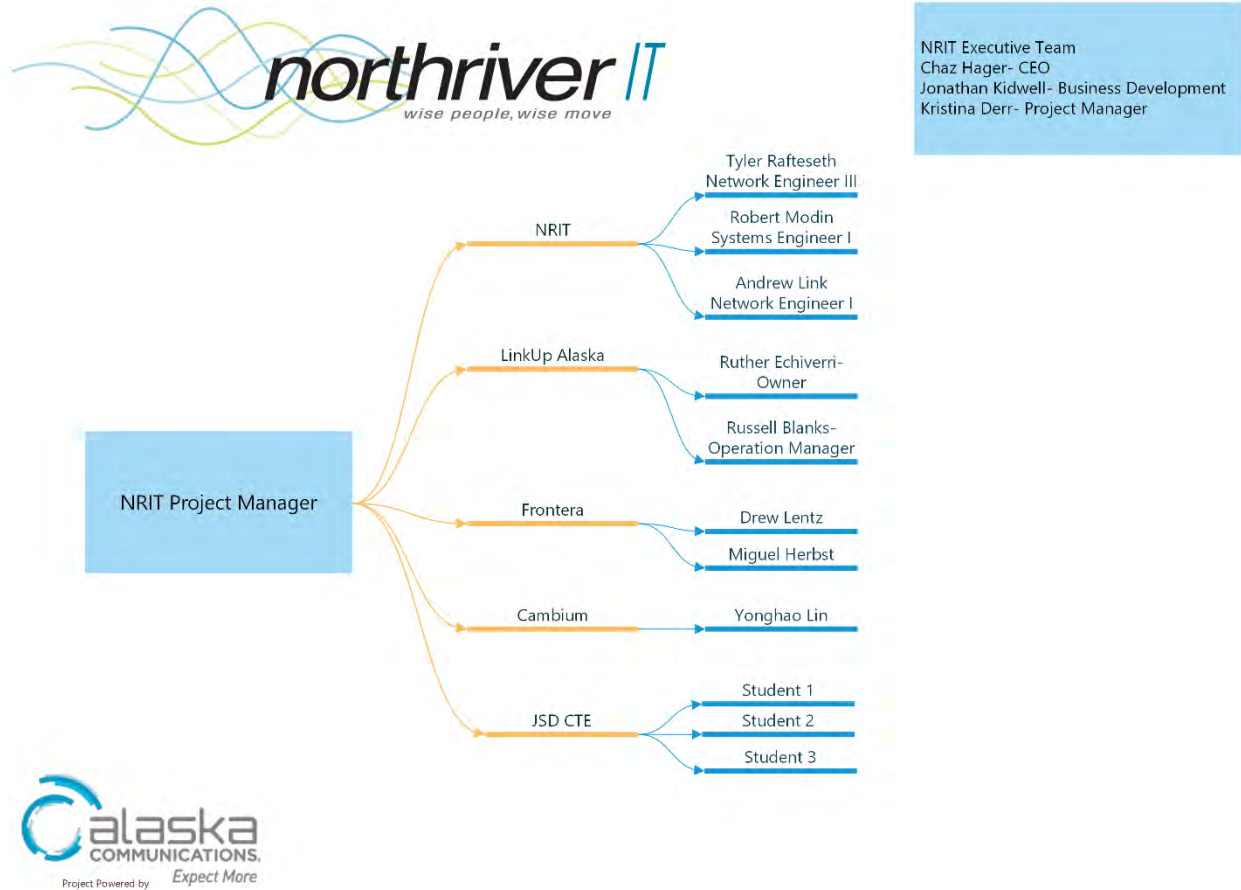


continuous cadence throughout the project to confirm timelines and ability to meet the deliverables within the desired timeline.

- The structure of our organization is specifically designed to install and support managed network services as required by this project. NRIT runs a world-class service desk consistently tracking customer satisfaction (live reviews listed on our website) combined with dedicated, certified, and experienced network engineers and project management.
- From staff additions in 2024 NRIT is properly equipped to install and support this project.
- Having experience with various SLED entities, NRIT understands the importance of staying within budget. For this reason, NRIT has elected to provide a simple, annual payment structure that is all-inclusive to the number of locations identified in our coverage maps.
- NRIT emphasizes the importance of on-site, local project management to mitigate contractual disputes. This approach involves proactive communication and real-time feedback through their project management platform, ConnectWise Manage. This platform promotes accountability by including all phases, deliverables, and tracking of associated work. NRIT plans to meet with the City and Borough of Juneau (CBJ) continuously throughout the project to confirm timelines and ensure deliverables are met within the desired timeframe.



Organizational Chart



- The organizational chart includes our experienced NRIT staff and experienced partners on this project.
- Kristina Derr, our project manager, will have complete decision-making authority (except scope changes impacting budget) and be accountable for the completion of the work. Kristina Derr will be a dedicated resource to CBJ throughout the duration of the project. Any scope changes impacting on the budget will require signing off from Chaz Hager, CEO.
- Frontera Consulting will play a crucial role in the management and training of staff throughout the project. Please refer to the experience of Miguel Herbst the Frontera project manager.



Project WBS

- Our work strategy is outlined below, followed by our proposed project schedule.
- Equipment details are highlighted in the technology solution details and appendix.

Work Breakdown Structure

1. Project Initiation

- 1.1 Project Kickoff Meeting
- 1.2 Stakeholder Identification
- 1.3 Approval of Project Charter

2. Planning

- 2.1 Review Scope of Work with CBJ
- 2.2 Validate Project Plan
- 2.3 Resource Allocation
- 2.4 Risk Management Planning
- 2.5 Communication Plan Development

3. Execution

- 3.1 Procurement of Equipment and Materials
- 3.2 Shipping and receiving
- 3.3 Collaboration with Partners
 - 3.3.1 Coordination with Cambium Networks
 - 3.3.2 Coordination with Frontera Consulting
 - 3.3.3 Coordination with LinkUp Alaska
 - 3.3.4 Coordination with Juneau School District
- 3.4 Installation of Wireless Backhaul and Associated Access Points
 - 3.4.1 Final Site Survey and Preparation
 - 3.4.2 Installation of Wi-Fi Access Points
 - 3.4.3 Configuration of Network Equipment
- 3.5 Deployment of Wi-Fi Coaches
 - 3.5.1 Training of Wi-Fi Coaches
 - 3.5.2 On-site Assistance for Residents and Visitors

4. Monitoring and Controlling

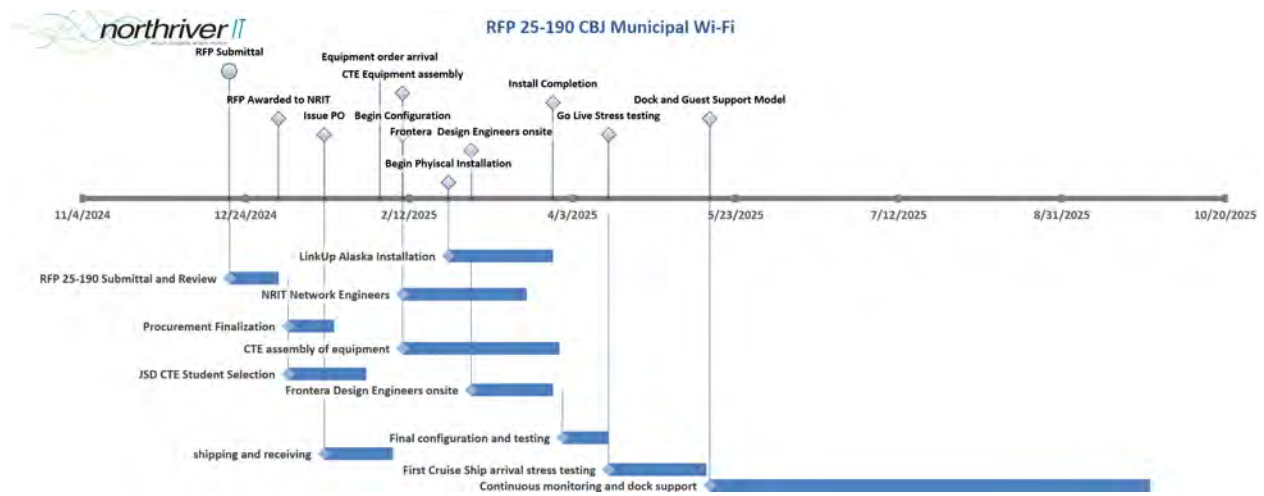


- 4.1 Performance Monitoring
- 4.2 Quality Assurance
- 4.3 Issue and Risk Management
- 4.4 Reporting and Documentation

5. Project Closure

- 5.1 Final Inspection and Testing
- 5.2 Acceptance from CBJ
- 5.3 Project Review and Lessons Learned
- 5.4 Project Closure Report

Project Schedule



Support

With a local office in Juneau, AK and headquarters in Bismarck, ND Northriver IT will provide administrative and support services both during and before normal CBJ work hours. Northriver IT will provide 24-hour assistance for troubleshoot outages, and other network service issues via an escalation path established for CBJ. Please note our references for significant documented experience with mid-to-large organizations providing similar technology upgrades and implementations and meeting or exceeding contractual performance.



Experience & Qualifications

NRIT has assembled the most qualified resources for the successful completion of this project. Each resource and partner were intentionally chosen due to their past performance, related project experience, and proven track record with NRIT. To demonstrate our complimentary efforts mutual projects are listed before individual references. Separately, each resume articulates individual experience and qualifications to be assigned to this project. Our combined experience illustrates significant documented experience with mid-to-large organizations providing similar technology upgrades and implementations. This experience also proves a satisfactory record of meeting or exceeding satisfactory contractual performance.

Here is a list of projects we have partnered on:

1. NRIT and Cambium Networks at Juneau School District.
2. NRIT and LinkUp Alaska at Juneau School District.
3. NRIT joined Frontera on-site during the comprehensive RF study in Juneau.
4. Cambium Networks and Frontera for the City of McAllen, TX.

Next to each reference are listed the most relevant projects of similar size and complexity. Please note Frontera Consulting will carry the burden of organizing the wireless deployment and ensuring the success of the design. As a result, for a reference to their approach to previous projects please see pages four – six of the previous MIZ RF study report. Reference here: [Contract No. 24-370 Radio Frequency Analysis Study - Final report.pdf](#).

Resumes for personnel are included in the Appendix.



Northriver IT:

City and Borough of Juneau: Migration and implementation of Microsoft 365 from premises Exchange to Microsoft 365 GCC. Integrate legacy Active Directory with Microsoft Entra and incorporate InTune Device Management.

Chris Murray

CBJ IT Director

chris.murray@juneau.gov

907-957-2245

Matanuska Susitna Borough School District: Co-manage network of ~1,600 wireless access points and ~600 network switches. Supporting 20,000 daily users.

Justin Michaud

Senior Program Manager, IT

justin.michaud@matsuk12.us

907-317-2721

Juneau School District: Managed service of ~400 wireless access points and ~225 network switches. Supporting 5,000 daily users.

Dylan Jobsis

IT Officer

dylan.jobsis@juneauschools.org

907-957-1772

Cambium Networks:

1. City of San Jose, CA: [City of San José Launches Downtown Public Wi-Fi](#)
2. City of McAllen, TX: [McAllen, Texas Launches Public Wi-Fi](#)
3. City of Aurora, CO: [Municipal Network in Aurora, CO](#)



Frontera Consulting:

City of McAllen WiFi Deployment: Performed the design, configuration, and implementation to install over 900 access points and subscriber modules combined with 24 base stations in under 60 days!

Contact: Robert Acosta
Director of Information Technology
racosta@mcallen.net
956-681-1115

City of Pharr WiFi and Video Surveillance for City Parks

Jose J. Pena
IT & Media Director
jose.pena@pharr-tx.gov
956-402-4900

City of Pharr / PSJA School District

Jose J. Pena
IT & Media Director
jose.pena@pharr-tx.gov
956-402-4900

LinkUp Alaska

Bartlett Regional Hospital IT

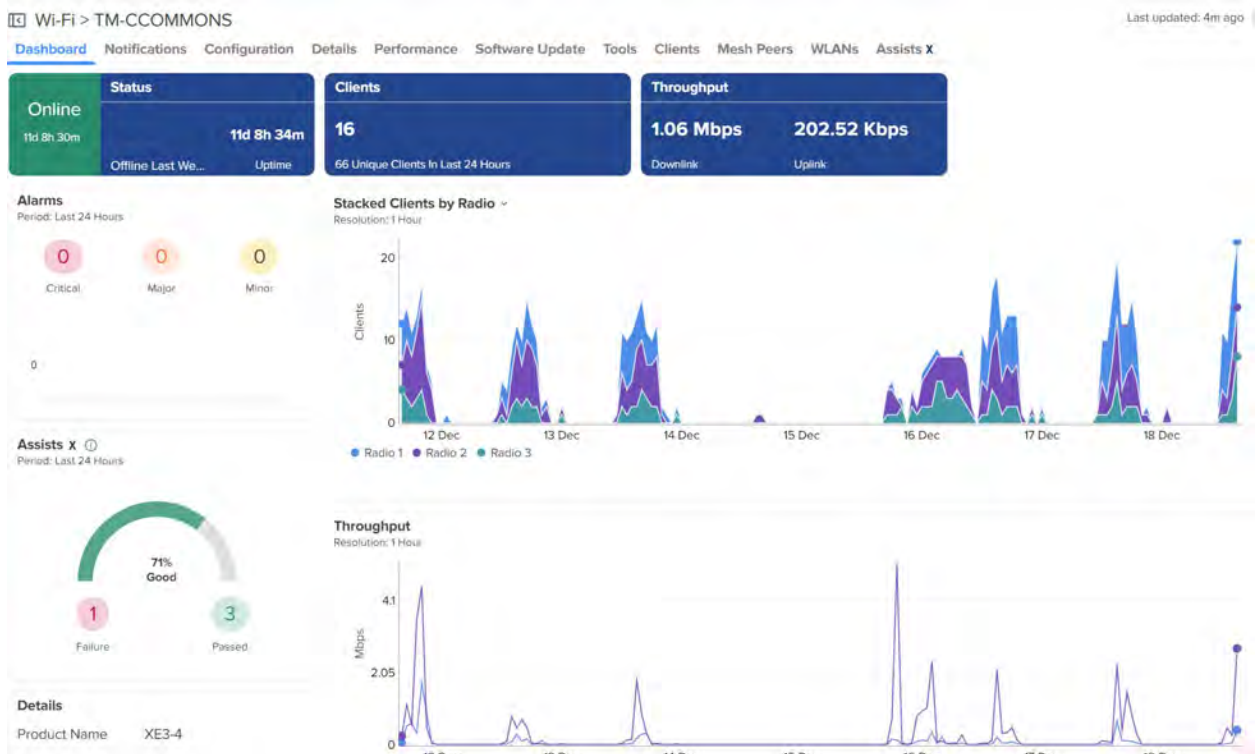
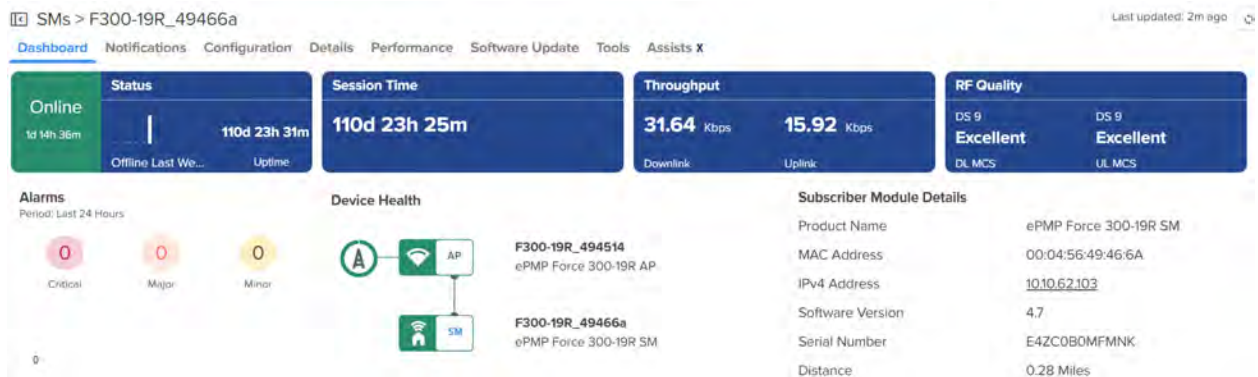
James Banda
907-209-7510
jbanda@bartletthospital.org

Juneau School District Maintenance

Mark Ibias
907-321-2251

Reporting Requirements:

- Reporting will be derived from a combination of FortiCloud (Internet gateway), cnMaestro X the cloud management for the Cambium Networks equipment, and DNSFilter.
- The client behavior including signal strength measurements and other data is defined in the reporting section of cnMaestro X. The Appendix contains a datasheet of cnMaestro X and below is a basic visual sampling of the data that is derived from the dashboard.





Price Proposal:

This is a full-service solution based on the requirements of CBJ and as a result the pricing is presented as a complete solution instead of a part-number, line-item quote. To ease CBJ in possible scope changes NRIT can provide a per-location number. The current design for desired coverage relies on 102 individual pole locations. In the event CBJ determines they must own the equipment (not indicated in the RFP) NRIT can provide an alternative buyout during contract negotiations.

NRIT understands that funding must be allocated annually and has presented an annual payment schedule for renewals in subsequent years matching the term of the five (5) year contract. Each year represents an annual 3% increase.

Year 1: \$749,000.00

Year 2: \$771,470.00

Year 3: \$794,614.10

Year 4: \$818,452.52

Year 5: \$843,006.10



Appendix:

1. Personnel Resumes.
2. Manufacturer datasheets.
 - a. FortiGate 200G.
 - b. Cambium Networks V2000/V3000/V5000 and XE3-4TN.
 - c. DNSFilter.
 - d. SignalRoam.
 - e. Solis LPT 148 and UPS 12090.
3. Definition of a Wi-Fi Coach.
 - A Wi-Fi Coach is an individual that assists passengers and residents with the accessibility, usability, and reliability of the city's large scale high-density wireless network.
 - Enhance the passenger and resident experience! It is incredibly important to the city, cruise lines, and NRIT, that a visitor off ship experience is positively memorable in every way - and network connectivity is key to ensuring this experience. A high-density cruise port could have the largest, fastest network with the best applications, but support does not matter if the guests or visitors don't know about it, why it exists, and how to connect to it.
 - Wi-Fi Coaches not only help promote and communicate the availability of the Wi-Fi network, but they also assist passengers and residents when connecting mobile devices to the Wi-Fi Network especially If they are not connected automatically with SignalRoam.
 - Wi-Fi Coaches are up to speed on the latest OS software bug and feature enhancements that are related to Wi-Fi connectivity concerns
 - Wi-Fi Coaches can troubleshoot and diagnose client problems and will communicate any unresolved issues to the NRIT network management team
4. Photos of past installations.

Chaz Hager

Passionate leader of managed services provider that focuses on secure and reliable network connectivity.

Experience

January 2007 - PRESENT

CEO/Northriver IT

- Hands on leader of Managed Services Provider that specializes in installing, configuring, and managing client networks.
- The team is responsible for thousands of network devices including switches, wireless access points, backhaul, firewalls, and associated connected services.
- Leads team of fifteen individuals that provide world-class service to customers spread from Virginia to Alaska each day
- Supporting thousands of end-users and network devices across a customer base of over thirty different, diverse organizations
- Consistently achieving double-digit percentage growth year-over-year for the past five years

Education

December 2008

Master of Business Administration/University of Mary, Bismarck, ND

Certificates

MCSA 70-346: Managing Office 365 Identities

*CCNA Completed Coursework

Jonathan Kidwell

Experienced Senior Sales Director with a demonstrated history of working in the networking, security and wireless industry. Strong sales professional skilled in Enterprise Risk Management, Sales, Wireless, Data Center, and Software as a Service (SaaS). Specific skills in both State & Local Government Sales environments as well as Education.

Experience

December 2023 - PRESENT

Dir of Business Development / North River IT

- Oversee Sales Strategy – Marketing – Business Outreach & Development

August 2019 – December 2023

Sr Director of Enterprise Sales North America / Cambium Networks

- Lead North America sales teams for All Cambium Wi-Fi and Switching Portfolios
- Lead the SLED Vertical Go to Market for North America

November 2004 – July 2019

Dir Educational Sales & Solutions / Extreme Networks

- Lead State & Local and Educational Sales for United States

Education

2004

Master of Business Administration / Wayland Baptist University

1997

Bachelor Computer Science / Campbellsville University

Certificates

- Cambium cnMatrix Switches Fundamentals Certified
- Cambium Enterprise Wi-Fi Fundamentals Certified
- Cambium cnMaestro Essentials Certified
- Extreme Networks Professional Sales Certification

Kristina Derr

Professional Project manager who focuses on planning, executing and overseeing projects to ensure they are completed on time, within budget, and to a high quality of standards.

Experience

September 2024- Present

Project Manager/ Northriver IT

- Managing accounts for medium to large clients, ranging from construction companies to school districts.
- Highly organized, timeline and budget driven decision maker.
- Highly effective communicative team lead, facilitating problem solving, increased efficiency and higher morale among team members.

September 2015- August 2024

Information Technology Officer / Juneau School District

- Oversee employees on implementation and maintenance of IT infrastructure, coordinated with various departments to meet their technological needs.
- Co-Managed JSD school consolidation and restructuring.
- Ensuring security and efficiency of IT systems.
- Managed a team of 12 internal IT staff

User Support Lead- 08/2018-04/2022

- Coordinated and managed IT User Support for all departments and schools.
- Managed all summer IT site maintenance and upgrade projects.
- Managed Infrastructure and wireless upgrade with NRIT summer 2019
- Successfully planned and implemented 1:1 program during COVID.

User Support Technician- 09/2015-08/2018

April 2010- February 2015

Station Supervisor / Alaska Airlines Juneau Station

- Managed airline operations, customer service, and cargo.
- Schedules for all union employees.
- Participated in airport emergency safety board.

Certificates

CompTIA A+

*CompTIA Project + Completed Coursework

*ITIL V4 Completed Coursework

Tyler Rafteseth

Experience

September 2017 - PRESENT

Network Engineer III/Northriver IT

- Installed, configured, and supported hundreds of Extreme Networks switches, wireless access points, and support/configuration of Extreme Management Center.
- Installed, configured, and supported hundreds of Cambium Networks switches, access points, and support/configuration of cnMaestro Cloud. *Direct engagement with Cambium developers and engineers on code improvements and releases.*
- Installed, configured, and supported hundreds of Fortinet firewalls. Includes integration of FortiCloud.
- Installed, configured, and supported hundreds of Cisco firewalls (FTD), switches, and wireless access points. Includes support of Firepower Management Center.

2015 - 2016

Tech Support I/TMI Communications

- Managed PBX Systems of Hotels Nationwide.
- On-site install of PBX/routers/switches
- Documented All Work Progress, Findings, and Results of all tickets.

Education

May 2015

Associate's in Information and Communication Technology/North Dakota State

College of Science

Certificates

- Extreme Certified Network Associate
- Extreme Control Certified
- Extreme Wireless Cloud Certified
- Extreme Wireless Core Certified
- Extreme Campus Fabric Certified
- Extreme Wireless/Site Engine/Installation/Switching/Control Certified
- Cambium Certified Security and SD-WAN Fundamentals
- Cambium cnMaestro X Advanced Certified
- Cambium cnMaestro X Fundamentals Certified
- Cambium cnMatrix Switches Fundamentals Certified
- Cambium Enterprise Wi-Fi Fundamentals Certified
- Cambium cnMaestro X Certified Administrator
- Cambium cnMaestro Essentials Certified

Andrew Link

Experience

May 2022 - PRESENT

Network Engineer I/Northriver IT

- Installed, configured, and supported hundreds of Extreme Networks switches, wireless access points, and support/configuration of Extreme Management Center.
- Installed, configured, and supported hundreds of Cambium Networks switches, access points, and support/configuration of cnMaestro Cloud. *Direct engagement with Cambium developers and engineers on code improvements and releases.*
- Installed, configured, and supported hundreds of Fortinet firewalls. Includes integration of FortiCloud.

August 2021 – April 2022

Help Desk Agent/Dynamic Campus

- Assisted staff and administration with desktop support
- Password resets and computer management through AD and SCCM
- Shadowed lead network engineer and assisted with basic networking support.

Education

May 2025

Bachelors in Cybersecurity Administration/University of Mary

Certificates

- Extreme Certified Network Associate
- Extreme Control Certified
- Extreme Wireless Cloud Certified
- Extreme Wireless Core Certified
- Extreme Campus Fabric Certified
- Extreme Wireless/Site Engine/Installation/Switching/Control Certified
- Cambium XMS-Cloud Administrator Certified
- Cambium cnMatrix Switches Fundamentals Certified
- Cambium Enterprise Wi-Fi Fundamentals Certified
- Cambium cnMaestro X Certified Administrator
- Cambium cnMaestro Essentials Certified

Robert Modin

Experience

May 2022 - PRESENT

Systems Engineer I/Northriver IT

- Installed, configured, and supported hundreds of Cambium Networks switches, access points, and support/configuration of cnMaestro Cloud.
- Installed, configured, and supported Cisco FTD firewalls and Firepower Management Center.
- Installed, configured, and supported DNSFilter for several customers across thousands of devices.
- Installed, configured, and supported Microsoft 365 Entra, InTune, and the rest of the M365 ecosystem for thousands of users across several customers.

October 2021 – April 2022

Computer Operator Tech/State of North Dakota

- Assisted staff and administration with desktop support.
- Monitor active jobs on mainframe.
- Complete backups for multiple systems.
- Answer help desk support calls.

Education

August 2023

Bachelors of Cybersecurity and Information Technology/Bismarck State College

Certificates

- Microsoft 365 Certified: Administrator Expert
- Fortinet NSE 3

Miguel Herbst

Phone 956-821-2194

E-mail: mherbst01@gmail.com

I have over twenty-five years of experience in technical/network design, deployment and support. I am a CBRS Certified Professional Installer (CPI) and specialize in providing end-to-end solutions, from consultation, technical design, implementation, and continuous support for data networks across diverse platforms.

Skills:

- Proficient in designing, configuring, and managing data networks on various platforms.
 - Excellent communication skills, enabling effective collaboration with individuals from diverse backgrounds.
 - Extensive knowledge of hardware and software configuration and troubleshooting.
 - Bilingual in English and Spanish, with proficiency in reading, writing, and speaking.
 - Extensive experience in interfacing with Government and Law Enforcement Agencies such as DEA, ICE, DHS, SJPD, LFPD, etc.
 - Expertise in multiple broadband wireless platforms and equipment.
 - Extensive knowledge of IP cameras and NVR platforms.
 - Skilled in designing and implementing user-specific network configurations using equipment from various vendors, including Cisco, Mikrotik, HP, Cambium, and Ubiquiti.
 - Extensive knowledge of Windows Server (2008/2008R2/2012/2019), Active Directory, Group Policy, Domain Controllers, DHCP Servers, File Servers, VMWare, and Hyper-V.
-

Experience:

Frontera Consulting Group - McAllen, TX (2018 - Present)

COO / Solutions Engineer

Recent Projects Overview:

- **August 2023: NACISD PLTE Deployment**

Designed and installed a Proof of Concept Private LTE solution to facilitate connectivity to students.

- **July 2023: Edwards Vacuum PLTE Deployment**

Designed and installed a Private LTE solution to facilitate video surveillance within the company parking lot.

- **January 2023: PTP Tower Deployment**

Oversaw the permitting, engineering, and construction of a 90ft self-supporting tower to facilitate cross-border Point-to-Point wireless backhaul.

- **July 2022: Plainview ISD PTP**

Designed a Wireless Point-to-Point solution, including a 120 ft tower installation, to facilitate end-to-end connectivity for a PLTE solution.

- **December 2021 - 2023: MEAA WiFi / PLTE Deployment**

Surveyed and upgraded WiFi infrastructure for autonomous vehicle driving in an R&D setting, deploying a Private LTE system to expand coverage and improve connectivity.

- **August 2021 - 2022: Bungalows on Shary WiFi Deployment**

Oversaw the design, procurement, and deployment of a fiber and WiFi network for a boutique-style residential hotel, providing reliable high-speed WiFi coverage throughout the campus.

- **July 2021: ABC Inc 60Ghz Parking Lot Deployment**

Deployed a 60 GHz fixed wireless and outdoor WiFi network in a distribution center trucking yard environment, facilitating vehicle tracking and potential autonomous vehicle deployment.

- **February 2021: McAllen CBRS Traffic Deployment**

Designed and configured CBRS connectivity for 97 traffic intersections in McAllen, improving traffic light control and reducing operational costs.

- **July 2020: McAllen CBRS Deployment**

Managed the deployment of a community-wide fixed wireless broadband and outdoor WiFi access network, leveraging CBRS Spectrum to provide internet access during the COVID pandemic.

- **February 2020: Sugarland PtMP & PTP Deployment**

Led the design and deployment of a citywide backhaul infrastructure upgrade and Point-to-MultiPoint network relocation, improving connectivity for 22 intersections and completing the city's wireless backhaul ring.

- **December 2019: City of Pharr Parks PtMP**

Designed, configured, and oversaw the deployment of a citywide Point-to-Multipoint network, providing WiFi, video surveillance, and emergency call-back system connectivity to city parks.

Rioplex Broadband - McAllen, TX (2003 – 2017)

Network Administrator

Managed a network spanning over 1000 square miles with 500+ wireless clients, overseeing design, implementation, and maintenance of the entire network infrastructure.

SatComHSI - McAllen, TX (2001 - 2003)

Lead Technician

Reported directly to the Company Owner and Network Administrator, developing a continuing education curriculum and maintaining the helpdesk ticketing system.

Acnet / Tiagris Corporation - McAllen, TX (1999-2001)

Technical Support Supervisor

Managed technical support operations, interfaced with various company departments, and maintained shift scheduling in accordance with company policies.

This revision aims to provide a clearer and more structured presentation of your skills and experience. Feel free to further customize based on your preferences and specific requirements.

Education:

Diploma 1997-2001 McAllen Memorial High School McAllen, TX

References listed on next page.

References:

Drew Lentz

Senior Solutions Architect @ Eero

956-607-5850

drewlentz@gmail.com

Art Adams

Chief Information Officer at Gila Corporation

956-458-4653

artadams@gmail.com

Jason Aaberg

Senior Systems Engineer @ SP Plus

956-648-1737

jaaberg@spplus.com

Drew Lentz

McAllen, TX 78503 | 956-607-5850 | drew@drewlantz.com

[LinkedIn Profile](#)

Executive Wireless Solutions Leader

Driving Community Infrastructure, Bridging the Digital Divide, and Leading Wireless Innovation

Visionary wireless strategist and business leader with 20+ years of experience across global technology firms including **Cisco**, **Meta**, and **Comcast**, as well as founding and leading **Frontera Consulting**. Expert in designing and implementing large-scale connectivity solutions for enterprises, municipalities, school districts, and underserved regions. Proven ability to deliver measurable outcomes through scalable, cost-effective wireless infrastructure.

Professional Experience

Co-Founder and Wireless Solutions Architect | Frontera Consulting | McAllen, TX | 2009 – Present

- **Community Infrastructure:** Led the deployment of citywide wireless solutions, including a 1,000+ access point CBRS network in McAllen, Texas, completed within 60 days to expand public broadband access.
- **Bridging the Digital Divide:** Partnered with municipalities and school districts to deliver high-speed internet for remote learning, enhancing access for thousands of students and families.
- **Technology Leadership:** Collaborated with leading technology manufacturers to implement customized connectivity solutions for education, public safety, and enterprise clients.
- **Award-Winning Solutions:** Projects have received national recognition for innovation in connectivity and for serving as a replicable model for other communities.
- **Thought Leadership:** Actively engaged in speaking at industry events, webinars, and forums to share insights on community infrastructure development and the future of wireless communications.

Key Achievements:

- Deployed 1,000 Wi-Fi/CBRS access points citywide in record time to address critical public connectivity needs.

- Enabled remote learning initiatives through robust connectivity solutions during the COVID-19 pandemic.

- Drove business growth by expanding Frontera Consulting's reputation as a trusted wireless solutions partner for enterprises and municipalities.

Wireless Engineering Product Manager | Cisco | Jan 2023 – Apr 2024

- Led product roadmap for enterprise wireless solutions across Catalyst and Meraki platforms.

- Enhanced connectivity infrastructure for large public venues, enterprises, and smart cities globally.

- Delivered customer-centric solutions via strategic partnerships and industry engagements.

Connectivity Ecosystems Engineer | Meta | Jan 2021 – Jan 2023

- Expanded connectivity access for underserved regions using OpenWiFi and OpenRoaming technologies.

- Achieved 1500% YoY growth by scaling partnerships with Tier-1 operators and global enterprises.

- Championed large-scale trials of Wi-Fi 6E and next-gen wireless tech for public infrastructure.

Senior Wireless Solutions Architect | Comcast Business | Jul 2018 – Dec 2021

- Designed and deployed multi-million-dollar wireless solutions for theme parks, public safety networks, and Fortune 100 enterprises.

- Spearheaded initiatives that enhanced connectivity for smart cities, education, and hospitality sectors.

Certifications

- Cisco CCNA | CWNP CWNA | Aruba ACMP | Ekahau | Cambium | LTE Alliance

The Bottom Line

As the co-founder of Frontera Consulting and a wireless technology leader with experience at Cisco, Meta, and Comcast, I specialize in transforming community infrastructure and deploying scalable connectivity solutions. My expertise drives innovation and measurable outcomes for municipalities, school districts, enterprises, and underserved regions.

Victoria Elizabeth De La Cerda Salazar

victoriaelizabethdelacerda@gmail.com | (956) 325-6624

Experienced project manager with a background in network infrastructure, IT support, and software development. Proven success in managing and deploying technology solutions for both commercial and community-based projects.

JOB & INTERNSHIP EXPERIENCE

- **Frontera Consulting LLC | Network Support Specialist & Project Assistant**

July 2020 - October 2020: McAllen, TX City CBRS Deployment

- Managed and Participated in the McAllen Free WiFi initiative. I was the Team Lead for the group responsible for building and configuring the CBRS equipment. I was in charge of inventory, task delegation, timeline management and team management.
- Aided in the configuration and deployment of equipment throughout the city during the COVID pandemic to offer free WiFi for the community.

- **WiFiStand LLC | General Manager & Customer Service Lead**

October 2019 - Present

- Management and distribution of products worldwide through Shopify online store.
- I'm responsible for management and distribution of products worldwide through the online store as well as customer service and sales. I'm also responsible for finance and office management of the company. The devices that we sell are WiFiStand AP deployment brackets and specialized kits for rapid temporary WiFi deployment.

- **Expanding Frontiers | Software Developer**

February 2022 - June 2023

- Worked with a software development team with the goal to streamline and improve the organization's international online competitions, specifically establishing software integrated with the communications programs.
- Created software programs integrated to the app Discord where the organization's international competitions took place. The software facilitated the categorization of communications channels and set parameters to avoid misconduct during the competitions.

- **Space Coders Program by Expanding Frontiers | Software Developer**

October 2021 - January 2022

- I was part of a software development team that takes on project challenges with the goal to strengthen our programming and teamwork skills. The programming challenges vary from machine learning based, web development, specialized software, etc.

- **PSJA ISD Management Information Systems Department | IT Assistant intern**

February 2019 - May 2019

- I worked with many different departments within this internship like the cybersecurity of the school district, maintenance and installation of devices, and IT desk help for students and staff of the PSJA school district.

EDUCATION

- **South Texas College** | Graduated 2020
 - Associate's degree in Mathematics
 - Internet and Computer Specialist Certification
- **The University of Texas at Rio Grande Valley** | Graduated 2022
 - Bachelor's degree in Computer Science, Cum Laude

CERTIFICATIONS

- CompTIA IT Fundamentals Certified.
- CompTIA A+ ce Certified.
- Microsoft Technology Associate- Windows Operating Systems Fundamentals Certified.
- Microsoft Technology Associate - Network Fundamentals Certified.
- Google Technical Support Fundamentals Certified.

HONORS AND AWARDS

- 2018 AP Scholar with Honor.
- 2019 Hispanic Scholarship Fund Scholar.
- 2019 National Hispanic Recognition Program College Board Award. –Granted to Hispanic students with a high percentile on the PSAT/NMSQT.

SKILLS

- **Project Management:** Team leadership, task delegation, inventory management, resource planning.
- **Network Infrastructure:** AP deployment, network design, troubleshooting, and configuration.
- **Technical Proficiencies:** C++, Python, Assembly, Linux-based systems, Microsoft Office Suite.
- **Bilingual:** Fluent in English and Spanish.

Ruther Echiverri

OWNER/TELECOM CONSTRUCTION TECHNICIAN

EDUCATION

Centralia Community College
Centralia, WA
Associates in Technical Arts
Electronic Technology

REFERENCES

Available upon request

CERTIFICATIONS

BICSI RCDD - Registered Communication Distribution Designer
BICSI Technician
Journeyman Telecom Inside and Outside Construction

FUNCTIONAL SKILLS

Structured Cabling - Catx/Coax/Fiber
Copper and Fiber Splicing
Underground and Line Construction
Familiar and Knows how to use various Test Equipment -
OTDR, Fluke Catx/Coax/Fiber Tester

EXPERIENCE

April 2004 to February 2018
IBEW Telephone Inside and Outside Construction
• Juneau, AK

February 2018 to Present
Owner/CEO/Installer • Linkup Alaska

RUSSELL BLANKS

907 617 - 1039 | RUSSELL.BLANKS@LINKUPALASKALLC.COM

OPERATIONS MANAGER

Entrepreneurially-minded project driver building synergy between stakeholders to keep deadlines, scope, and budget on target

VALUE OFFERED:

- ✓ Customer cultivator who collaboratively works with clients to determine project needs (articulated / unarticulated), manages details from inception to close-out, and maintains scope to stay within expectations and deliverables.
- ✓ Contains material and personnel costs to keep project P&Ls on target; communicates deviances immediately to clients to ensure transparency and to facilitate customer decision-making.
- ✓ Compliance-driven project manager who navigates through difficult site terrain, expensive and complicated logistics, and multi-agency regulatory oversight to meet all applicable guidelines, rules, and laws.
- ✓ Timeline-focused deadline coordinator who accurately forecasts milestones for projects to provide achievable targets.

Quality Assurance | Timeline / Deadline Management | Cost Reduction | Project P&Ls | Budget Tracking | Project Scope Management | Risk Assessments | Compliance | Mitigation Plans | Material Logistics | Vendor Management | Construction Starts | Process Improvements | Efficiencies | Contracts | Client Relations | Reporting / Updates | Troubleshooting | Change Orders | Financial Analysis | Planning | Zoning | Permitting | Site Development

NOTABLE ACHIEVEMENTS:

Eagle Ascend Award, MasTec Network Solutions (2016)

CONSTRUCTION / PROJECT MANAGEMENT EXPERIENCE

Linkup Alaska LLC

Operations Manager 01/2023–Current

MasTec Network Solutions

Program Manager 11/2017–12/2022

Sr Project Manager, 3/2016–11/2017

Construction Project Manager, 01/2014–03/2016

Progressively promoted based on construction project management acumen and ability to break projects down into detailed components. Complete 250 projects / year valued at \$18-20 million; transform project ideas provided by clients into executable designs and logistics that involve integration of new technology into system without causing disruptions. Create project frameworks and deadlines around contract details, then allocate staff and financial resources accordingly. Oversee 35 field technicians and 7 managers.

- › **Increased project margins 20%** per project by hiring additional internal staff and eliminating use of sub-contractors.
- › **Won renewal of \$20 million client contract** after stepping in to clean up documentation and ensure that close-outs were completed property which persuaded client to renew, based on company professionalism.
- › **Boosted company's core strengths by rehiring entire crew of construction managers** to start with clean slate; recruited more competent personnel in order to fulfill rapidly rising project pipeline.
- › **Eliminated 50-project backlog by filling in staffing gaps and training new personnel** on time management techniques which helped team achieve more efficient results.
- › **Restored client's faith in company work quality** by repairing damaged relationship by reviewing historical issues and then concentrating that all milestones and deliverables were met.
- › **Captured 5% in material cost savings** by ordering items in bulk; developed usage forecasts to determine overall purchasing power.

ADDITIONAL BACKGROUND:

Tower Operations, Alaska Power and Telephone – Ketchikan, AK (2005- 2013)

EDUCATION

Colorado Technical University – Colorado Springs, CO

Program coursework in Bachelor in Science in Networking and Communication Management

FortiGate 200G Series



Highlights

Gartner® Magic Quadrant™ Leaders for both Network Firewalls and WAN Edge Infrastructure

Secure Networking with FortiOS for converged networking and security

State-of-the-art unparalleled performance with Fortinet's patented SPU and vSPU processors

Enterprise security with consolidated AI/ML-powered FortiGuard services

Deep visibility into applications, users, and devices beyond traditional firewall techniques

Artificial Intelligence, Machine Learning Security with Deep Visibility

The FortiGate 200G series next-generation firewall (NGFW) combines artificial intelligence (AI)-powered security and machine learning (ML) to deliver threat protection at any scale. Get deeper visibility into your network and see applications, users, and devices before they become threats.

Powered by Fortinet ASIC technology, the 200G series delivers industry-leading threat detection capabilities, allowing for faster identification and mitigation of cyberthreats. Powered by a rich set of AI/ML security capabilities that extend into an integrated Security Fabric platform, the FortiGate 200G series delivers secure networking that is broad, deep, and automated. Secure your network end to end with advanced edge protection that includes web, content, and device security, while network segmentation and secure SD-WAN reduce complexity and risk in hybrid IT networks.

Universal zero-trust network access (ZTNA) automatically controls, verifies, and facilitates user access to applications, reducing lateral threats by providing access only to validated users. Ultra-fast threat protection and SSL inspection provides security at the edge you can see without impacting performance.

IPS	NGFW	Threat Protection	Interfaces
9 Gbps	7 Gbps	6 Gbps	Multiple GE RJ45, 5GE RJ45, 10GE SFP+ Slots, GE SFP Slots

Use Cases



Next Generation Firewall (NGFW)

- FortiGuard Labs' suite of AI-Powered Security Services, natively integrated with your NGFW, secures web, content, and devices and protects networks from ransomware, malware, zero days, and sophisticated AI-powered cyberattacks
 - Real-time SSL inspection (including TLS 1.3) provides full visibility into users, devices, and applications across the attack surface
 - Fortinet's patented SPU technology provides industry-leading high-performance protection
-



Secure SD-WAN

- FortiGate WAN Edge powered by one OS and unified security and management framework and systems transforms and secures WANs
 - Delivers superior quality of experience and effective security posture for hybrid working models, SD-Branch, and cloud-first WAN use cases
 - Achieve operational efficiencies at any scale through automation, deep analytics, and self-healing
-



Universal ZTNA

- Control access to applications no matter where the user is and no matter where the application is hosted for universal application of access policies
 - Provide extensive authentications, checks, and enforce policy prior to granting application access every time
 - Agent-based access with FortiClient or agentless access via proxy portal for guest or BYOD
-



Segmentation

- Dynamic segmentation adapts to any network topology to deliver true end-to-end security from the branch to the data center and across multi-cloud environments
- Ultra-scalable, low latency, VXLAN segmentation bridges physical and virtual domains with Layer 4 firewall rules
- Prevents lateral movement across the network with advanced, coordinated protection from FortiGuard Security Services, detects and prevents known, zero-day, and unknown attacks



FortiGuard AI-Powered Security Services

FortiGuard AI-Powered Security Services is part of Fortinet's layered defense and tightly integrated into our FortiGate NGFWs and other products. Infused with the latest threat intelligence from FortiGuard Labs, these services protect organizations against modern attack vectors and threats, including zero-day and sophisticated AI-powered attacks.

Network and file security

Network and file security services protect against network and file-based threats. With over 18,000 signatures, our industry-leading intrusion prevention system (IPS) uses AI/ML models for deep packet/SSL inspection, detecting and blocking malicious content, and applying virtual patches for newly discovered vulnerabilities. Anti-malware protection defends against both known and unknown file-based threats, combining antivirus and sandboxing for multi-layered security. Application control improves security compliance and provides real-time visibility into applications and usage.

Web/DNS security

Web/DNS security services protect against DNS-based attacks, malicious URLs (including those in emails), and botnet communications. DNS filtering blocks the full spectrum of DNS-based attacks while URL filtering uses a database of over 300 million URLs to identify and block malicious links. Meanwhile, IP reputation and anti-botnet services guard against botnet activity and DDoS attacks. FortiGuard Labs blocks over 500 million malicious/phishing/spam URLs weekly, and blocks 32,000 botnet command-and-control attempts every minute, demonstrating the robust protection offered through Fortinet.

SaaS and data security

SaaS and data security services cover key security needs for application use and data protection. This includes data loss prevention to ensure visibility, management, and protection (blocking exfiltration) of data in motion across networks, clouds, and users. Our inline cloud access security broker service protects data in motion, at rest, and in the cloud, enforcing compliance standards and managing account, user, and cloud app usage. Services also assess infrastructure, validate configurations, and highlight risks and vulnerabilities, including IoT device detection and vulnerability correlation.

Zero-Day threat prevention

Zero-day threat prevention is achieved through AI-powered inline malware prevention to analyze file content to identify and block unknown malware in real time, delivering sub-second protection across all NGFWs. The service also integrates the MITRE ATT&CK matrix to speed up investigations. Integrated into FortiGate NGFWs, the service provides comprehensive defense by blocking unknown threats, streamlining incident response, and reducing security overhead.

OT security

With over 1000 virtual patches, 1100+ OT applications, and 3300+ protocol rules, integrated OT security capabilities detect threats targeting OT infrastructure, perform vulnerability correlation, apply virtual patching, and utilize industry-specific protocol decoders for robust defense of OT environments and devices.

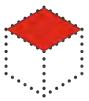




Available in



Appliance



Virtual



Hosted



Cloud



Container

FortiOS Everywhere

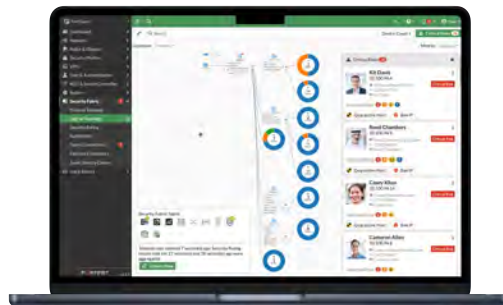
FortiOS, Fortinet's Real-Time Network Security Operating System

FortiOS is the operating system that powers Fortinet Security Fabric platform, enabling enforcement of security policies and holistic visibility across the entire attack surface. FortiOS provides a unified framework for managing and securing networks, cloud-based, hybrid, or a convergence of IT, OT, and IoT. FortiOS enables seamless and efficient interoperation across Fortinet products with consistent and consolidated AI-powered protection across today's hybrid environments.

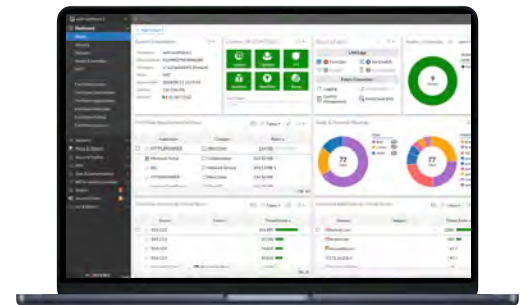
Unlike traditional point solutions, Fortinet adopts a holistic approach to cybersecurity, aiming to reduce complexities, eliminate security silos, and improve operational efficiencies. By consolidating security functions into a single platform, FortiOS simplifies management, reduces costs, and enhances overall security posture. Together, FortiGate and FortiOS create intelligent, adaptive protection to help organizations reduce complexity, eliminate security silos, and optimize user experience.

By integration generative AI (GenAI), FortiOS further enhances the ability to analyze network traffic and threat intelligence, detects deviations or anomalies more effectively, and provides more precise remediation recommendations, ensuring minimum performance impact without compromising security.

Learn more about what's new in FortiOS. <https://www.fortinet.com/products/fortigate/fortios>

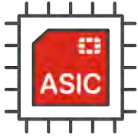


Intuitive easy to use view into the network and endpoint vulnerabilities



Comprehensive view of network performance, security, and system status

Fortinet ASICs: Unrivaled Security, Unprecedented Performance



Powered by the only purpose-built SPU

Traditional firewalls cannot protect against today's content and connection-based threats because they rely on off-the-shelf general-purpose central processing units (CPUs), leaving a dangerous security gap. Fortinet's custom SPUs deliver the power you need to radically increase speed, scale, and efficiency while greatly improving user experience and reducing footprint and power requirements. Fortinet's SPUs deliver up to 520 Gbps of protected throughput to detect emerging threats and block malicious content while ensuring your network security solution does not become a performance bottleneck.

Fortinet ASICs are designed to be energy-efficient, leading to lower power consumption and improved TCO. They deliver industry-leading throughput, handle more traffic and perform security inspections faster, reduce latency for quicker packet processing and minimize network delays.

Fortinet SPUs are designed with integrated security functions like zero trust, SSL, IPS, and VXLAN to name but a few, dramatically improving the performance of these functions that competitors traditionally implement in software.

Network processor NP7Lite

Fortinet's new, breakthrough SPU NP7Lite network processor works in line with FortiOS functions delivering:

- Superior firewall performance for IPv4/IPv6, SCTP, and multicast traffic with ultra-low latency
- VPN, CAPWAP, and IP tunnel acceleration
- Anomaly-based intrusion prevention, checksum offload, and packet defragmentation
- Traffic shaping and priority queuing

Content processor CP10

Content processors act as co-processors to offload resource-intensive processing of security functions. The tenth generation of the Fortinet Content Processor, the CP10, accelerates resource-intensive SSL (including TLS 1.3) decryption and security functions while delivering:

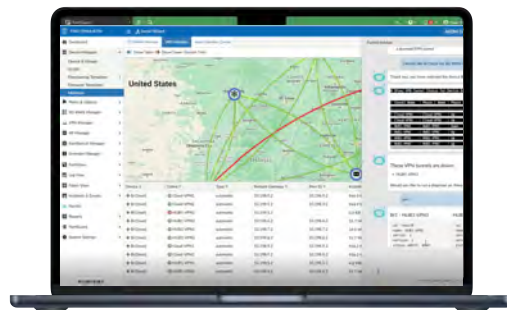
- Pattern matching acceleration and fast inspection of real-time traffic for application identification
- IPS pre-scan/pre-match, signature correlation offload, and accelerated antivirus processing

FortiManager

Centralized management at scale for distributed enterprises



FortiManager, powered by FortiAI, is a centralized management solution for the Fortinet Security Fabric. It streamlines mass provisioning and policy management for FortiGate, FortiGate VM, cloud security, SD-WAN, SD-Branch, FortiSASE, and ZTNA in hybrid environments. Additionally, FortiManager provides real-time monitoring of the entire managed infrastructure and automates network operation workflows. Leveraging GenAI in FortiAI, it further enhances Day 0–1 configurations and provisioning, and Day N troubleshooting and maintenance, unlocking the full potential of the Fortinet Security Fabric and significantly boosting operational efficiency.



GenAI in FortiManager helps manage networks effortlessly—generates configuration and policy scripts, troubleshoots issues, and executes recommended actions.

FortiConverter Service

Migration to FortiGate NGFW made easy



The FortiConverter Service provides hassle-free migration to help organizations transition quickly and easily from a wide range of legacy firewalls to FortiGate NGFWs. The service eliminates errors and redundancy by employing best practices with advanced methodologies and automated processes. Organizations can accelerate their network protection with the latest FortiOS technology.

FortiCare Services

Expertise at your service

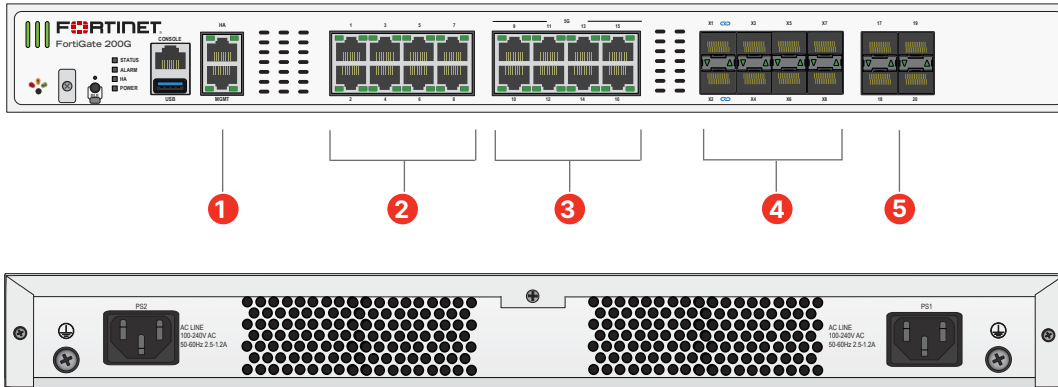


Fortinet prioritizes customer success through FortiCare Services, optimizing the Fortinet Security Fabric solution. Our comprehensive life-cycle services include Design, Deploy, Operate, Optimize, and Evolve. The FortiCare Elite, one of the service offerings, provides heightened SLAs and swift issue resolution with a dedicated support team. This advanced support option includes an extended end-of-engineering support of 18 months, providing flexibility and access to the intuitive FortiCare Elite portal for a unified view of device and security health, streamlining operational efficiency and maximizing Fortinet deployment performance.



Hardware

FortiGate 200G Series



Interfaces

1. 2 x GE RJ45 MGMT/HA Ports
2. 8 x GE RJ45 Ports
3. 8 x 5/2.5/GE RJ45 Ports
4. 8 x 10 GE SFP+/SFP FortiLink Slots
5. 4 x GE SFP Slots

Hardware Features



Trusted Platform Module (TPM)



The FortiGate 200G series features a dedicated module that hardens physical networking appliances by generating, storing, and authenticating cryptographic keys. Hardware-based security mechanisms protect against malicious software and phishing attacks.

Dual power supply



Power supply redundancy is essential in the operation of mission-critical networks. The FortiGate 200G series offers dual built-in non-hot swappable power supplies.

Access layer security



FortiLink protocol enables you to converge security and network access by integrating the FortiSwitch into the FortiGate as a logical extension of the firewall. These FortiLink-enabled ports can be reconfigured as regular ports as needed.

Signed Firmware Hardware Switch



The signed firmware switch is a physical security switch. It is by default set to the highest security level. The highest security level ensures that only an appropriately validated FortiOS firmware can be loaded on the FortiGate. This feature adds an additional physical layer of security to the FortiGate, acting as a key deterrent to and reducing risk of compromise.

Specifications

	FORTIGATE 200G	FORTIGATE 201G
Interfaces and Modules		
GE RJ45 Ports		8
GE RJ45 Management / HA		1 / 1
5/2.5/GE RJ45 Ports		8
GE SFP Slots		4
10/GE SFP/+ FortiLink Slots (default)		8
USB Port		1
Console Port		1
Onboard Storage	0	1× 480 GB SSD
Trusted Platform Module (TPM)		☑
Bluetooth Low Energy (BLE)		☑
Signed Firmware Hardware Switch		☑
Included Transceivers		0
System Performance — Enterprise Traffic Mix		
IPS Throughput ²		9 Gbps
NGFW Throughput ^{2,4}		7 Gbps
Threat Protection Throughput ^{2,5}		6 Gbps
System Performance and Capacity		
IPv4 Firewall Throughput (1518 / 512 / 64 byte, UDP)		39 / 39 / 26.5 Gbps
IPv6 Firewall Throughput (1518 / 512 / 64 byte, UDP)		39 / 39 / 26.5 Gbps
Firewall Latency (64 byte, UDP)		4.36 μs
Firewall Throughput (Packet per Second)		39.75 Mpps
Concurrent Sessions (TCP)		11 Million
New Sessions/Second (TCP)		400 000
Firewall Policies		10 000
IPsec VPN Throughput (512 byte) ¹		36 Gbps
Gateway-to-Gateway IPsec VPN Tunnels		2000
Client-to-Gateway IPsec VPN Tunnels		16 000
SSL-VPN Throughput ⁶		3 Gbps
Concurrent SSL-VPN Users (Recommended Maximum, Tunnel Mode)		500
SSL Inspection Throughput (IPS, avg. HTTPS) ³		7 Gbps
SSL Inspection CPS (IPS, avg. HTTPS) ³		7100
SSL Inspection Concurrent Session (IPS, avg. HTTPS) ³		900 000
Application Control Throughput (HTTP 64K) ²		27.8 Gbps
CAPWAP Throughput (HTTP 64K)		37.5 Gbps
Virtual Domains (Default / Maximum)		10 / 10
Maximum Number of FortiSwitches Supported		64
Maximum Number of FortiAPs (Total / Tunnel)		256 / 128
Maximum Number of FortiTokens		5000
High Availability Configurations	Active-Active, Active-Passive, Clustering	

	FORTIGATE 200G	FORTIGATE 201G
Dimensions and Power		
Height x Width x Length (inches)	1.75 × 17.0 × 15.0	
Height x Width x Length (mm)	44.45 × 432 × 380	
Weight	14.11 lbs (6.4 kg)	14.33 lbs (6.5 kg)
Form Factor (supports EIA/non-EIA standards)	Rack Mount, 1 RU	
AC Power Consumption (Average / Maximum)	145 W / 175 W	145 W / 176 W
AC Power Input	100–240V AC, 50/60Hz	
AC Current (Maximum)	2A @100VAC, 1.2A @240VAC	
Heat Dissipation	597.12 BTU/h	600.54 BTU/h
Power Supply Efficiency Rating	80Plus Compliant	
Redundant Power Supplies	☑ (Default dual non-swappable AC PSU for 1+1 Redundancy)	
Operating Environment and Certifications		
Operating Temperature	32°F to 104°F (0°C to 40°C)	
Storage Temperature	-31°F to 158°F (-35°C to 70°C)	
Humidity	5% to 90% non-condensing	
Noise Level	LPA 48 dBA / LWA 55 dBA	
Forced Airflow	Side and Front to Back	
Operating Altitude	Up to 10 000 ft (3048 m)	
Compliance	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB	
Certification	USGv6/IPv6	

Note: All performance values are “up to” and vary depending on system configuration.

¹ IPsec VPN performance test uses AES256-SHA256.

² IPS (Enterprise Mix), Application Control, NGFW and Threat Protection are measured with Logging enabled.

³ SSL Inspection performance values use an average of HTTPS sessions of different cipher suites.

⁴ NGFW performance is measured with Firewall, IPS and Application Control enabled.

⁵ Threat Protection performance is measured with Firewall, IPS, Application Control and Malware Protection enabled.

⁶ Uses RSA-2048 certificate.



Subscriptions

Service Category	Service Offering	A-la-carte	Bundles		
			Enterprise Protection	Unified Threat Protection	Advanced Threat Protection
FortiGuard Security Services	IPS — IPS, Malicious/Botnet URLs	•	•	•	•
	Anti-Malware Protection (AMP)—AV, Botnet Domains, Mobile Malware, Virus Outbreak Protection, Content Disarm and Reconstruct ³ , AI-based Heuristic AV, FortiGate Cloud Sandbox	•	•	•	•
	URL, DNS and Video Filtering — URL, DNS and Video ³ Filtering, Malicious Certificate	•	•	•	
	Anti-Spam		•	•	
	AI-based Inline Malware Prevention ³	•	•		
	Data Loss Prevention (DLP) ¹	•	•		
	Attack Surface Security — IoT Device Detection, IoT Vulnerability Correlation and Virtual Patching, Security Rating, Outbreak Check	•	•		
	OT Security—OT Device Detection, OT vulnerability correlation and Virtual Patching, OT Application Control and IPS ¹	•			
	Application Control			included with FortiCare Subscription	
	Inline CASB ³		included with FortiCare Subscription		
SD-WAN and SASE Services	SD-WAN Underlay Bandwidth and Quality Monitoring	•			
	SD-WAN Overlay-as-a-Service	•			
	SD-WAN Connector for FortiSASE Secure Private Access	•			
	SASE connector for FortiSASE Secure Edge Management (with 10Mbps Bandwidth) ²	•			
NOC and SOC Services	FortiConverter Service for one time configuration conversion	•	•		
	Managed FortiGate Service—available 24×7, with Fortinet NOC experts performing device setup, network, and policy change management	•			
	FortiGate Cloud—Management, Analysis, and One Year Log Retention	•			
	FortiManager Cloud	•			
	FortiAnalyzer Cloud	•			
	FortiGuard SOCaas—24×7 cloud-based managed log monitoring, incident triage, and SOC escalation service	•			
Hardware and Software Support	FortiCare Essentials ²	•			
	FortiCare Premium	•	•	•	•
	FortiCare Elite	•			
Base Services	Device/OS Detection, GeolPs, Trusted CA Certificates, Internet Services and Botnet IPs, DDNS (v4/v6), Local Protection, PSIRT Check, Anti-Phishing		included with FortiCare Subscription		

1. Full features available when running FortiOS 7.4.1.

2. Desktop Models only.

3. Not available for FortiGate/FortiWiFi 40F, 60E, 60F, 80E, and 90E series from 7.4.4 onwards.



FortiGuard Bundles

FortiGuard AI-Powered Security Bundles provide a comprehensive and meticulously curated selection of security services to combat known, unknown, zero-day, and emerging AI-based threats. These services are designed to prevent malicious content from breaching your defenses, protect against web-based threats, secure devices throughout IT/OT/IoT environments, and ensure the safety of applications, users, and data. All bundles include FortiCare Premium Services featuring 24×7×365 availability, one-hour response for critical issues, and next-business-day response for noncritical matters.

Ordering Information

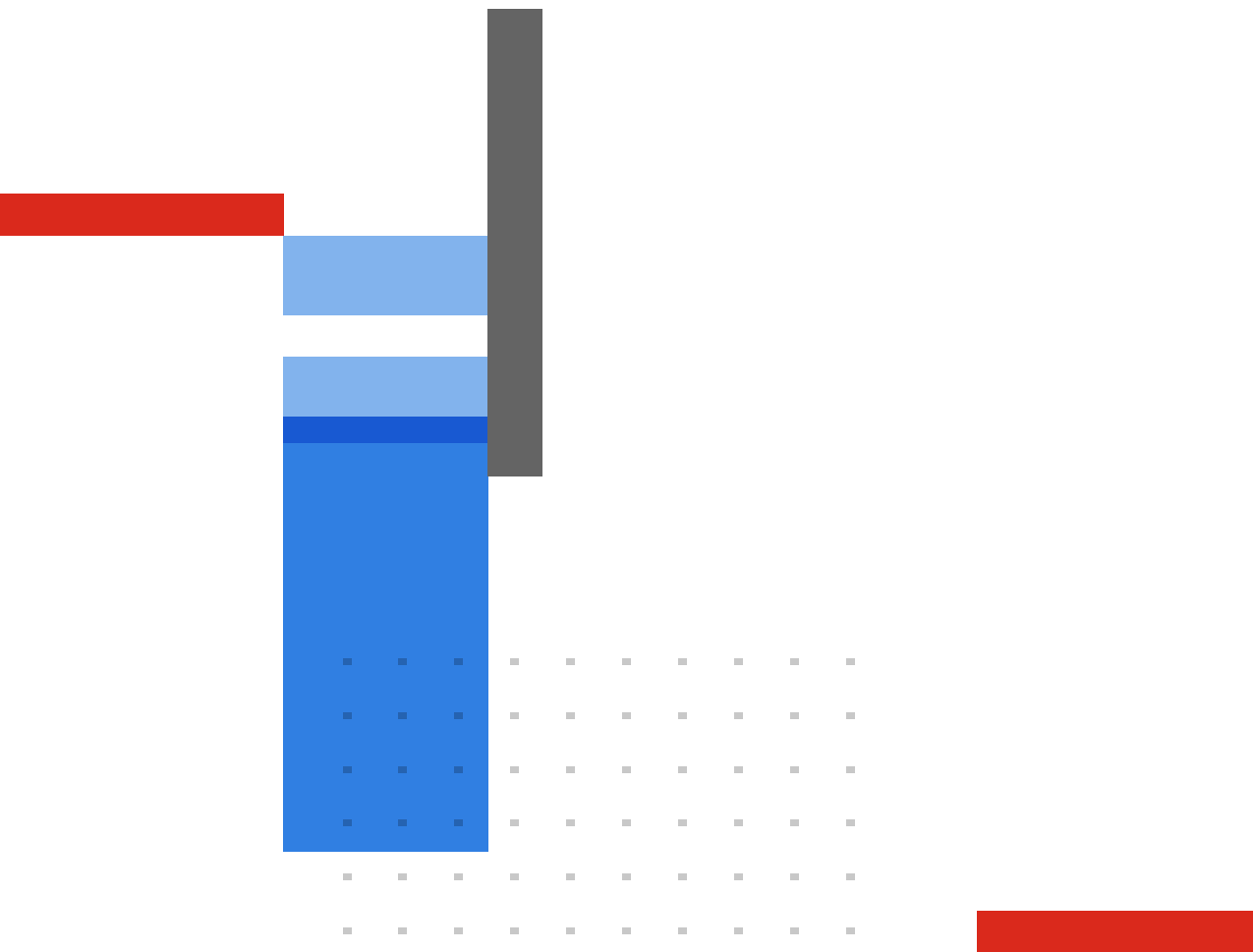
Product	SKU	Description
FortiGate 200G	FG-200G	10x GE RJ45 (including 1x MGMT port, 1x HA port, 8x switch ports), 4x GE SFP slots, 8x 5GE RJ45, 8x 10GE SFP+ slots, NP7Lite and CP10 hardware accelerated.
FortiGate 201G	FG-201G	10x GE RJ45 (including 1x MGMT port, 1x HA port, 8x switch ports), 4x GE SFP slots, 8x 5GE RJ45, 8x 10GE SFP+ slots, NP7Lite and CP10 hardware accelerated, 480GB onboard SSD storage.
Transceivers		
1 GE SFP SX Transceiver Module	FN-TRAN-SX	1 GE SFP SX transceiver module for all systems with SFP and SFP/SFP+ slots.
1 GE SFP LX Transceiver Module	FN-TRAN-LX	1 GE SFP LX transceiver module for all systems with SFP and SFP/SFP+ slots.
10 GE SFP+ RJ45 Transceiver Module	FN-TRAN-SFP+GC	10 GE SFP+ RJ45 transceiver module for systems with SFP+ slots.
10 GE SFP+ Transceiver Module, Short Range	FN-TRAN-SFP+SR	10 GE SFP+ transceiver module, short range for all systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver Module, Long Range	FN-TRAN-SFP+LR	10 GE SFP+ transceiver module, long range for all systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver Module, Extended Range	FN-TRAN-SFP+ER	10 GE SFP+ transceiver module, extended range for all systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver Module, 80km Extreme Long Range	FN-TRAN-SFP+ZR	10GE SFP+ transceiver module, 80km extreme long range, for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver Module, 30km Long Range	FN-TRAN-SFP+BD27	10GE SFP+ transceiver module, 30km long range single BiDi for systems with SFP+ and SFP/SFP+ slots (connects to FN-TRAN-SFP+BD33, ordered separately).
10 GE SFP+ Transceiver Module, (connects to FN-TRAN-SFP+BD27, ordered separately)	FN-TRAN-SFP+BD33	10GE SFP+ transceiver module, 30km long range single BiDi for systems with SFP+ and SFP/SFP+ slots (connects to FN-TRAN-SFP+BD27, ordered separately).
25 GE SFP28 Transceiver Module, Short Range	FN-TRAN-SFP28-SR	25 GE SFP28 transceiver module, short range, compatible with 10 GE SFP/SFP+ slots.
Cables		
10 GE SFP+ Passive Direct Attach Cable 1m	FN-CABLE-SFP+1	10 GE SFP+ passive direct attach cable, 1m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Passive Direct Attach Cable 3m	FN-CABLE-SFP+3	10 GE SFP+ passive direct attach cable, 3m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Passive Direct Attach Cable 5m	FN-CABLE-SFP+5	10 GE SFP+ passive direct attach cable, 5m for systems with SFP+ and SFP/SFP+ slots.

Visit <https://www.fortinet.com/resources/ordering-guides> for related ordering guides.



Fortinet Corporate Social Responsibility Policy

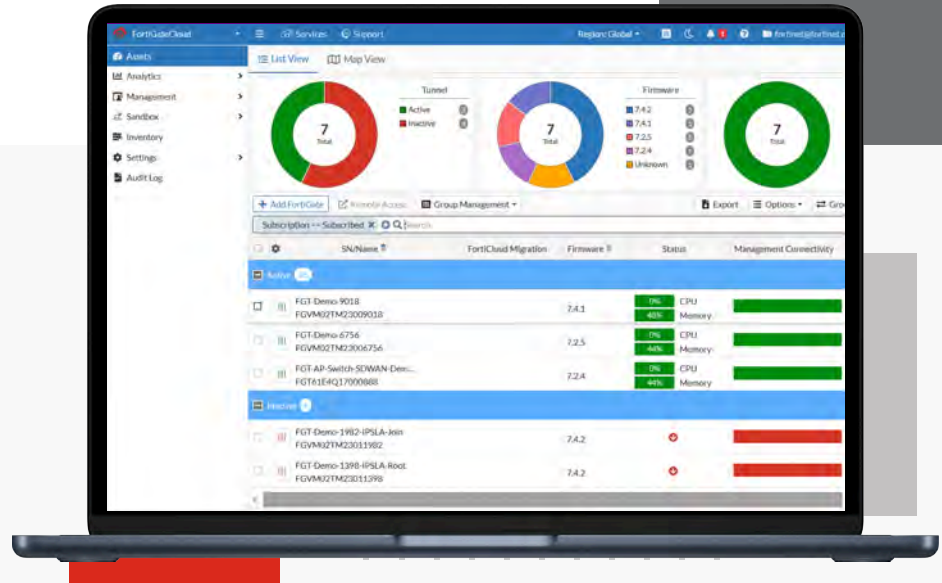
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FortiGate Cloud



Highlights

- Zero touch provisioning
- Simplified FortiGate network and security management
- Unrestricted device configuration management
- Firmware upgrades, configuration backups, and scripting
- Monitoring, cloud logging and security Analytics
- Automated reporting and event handlers
- Cloud Sandbox
- Indicators of Compromise (IOC)
- Multitenancy

Cloud Management and Analytics for FortiGate Firewalls

FortiGate Cloud is a cloud-based service offering simplified management, security analytics, and reporting for Fortinet's FortiGate next-generation firewalls to help you more efficiently manage your devices and reduce cyber risk. It simplifies the initial deployment, setup, and ongoing management of FortiGates and downstream connected devices such as FortiAP, FortiSwitch, and FortiExtender, with zero-touch provisioning. FortiGate Cloud can grow with your requirements from a single FortiGate to a complete MSP management solution for thousands of devices across multiple customers.

Highlights



International Cloud Management

- Isolated instances for Europe, America, and Asia ensure data separation for privacy laws
- Simultaneously provision devices in multiple regions



Zero Touch Provisioning

- Zero touch provision FortiGates with FortiCloud key
- Bulk import and provisioning with FortiDeploy key



Network Visibility and Cloud Management

- Comprehensive overview of network, assets, device health, and statistics
- Management firewall configuration from cloud including security profiles, firewall policies, cloud config backups, CLI scripts, API access, and firmware upgrades



SD-WAN

- Configure SD-WAN interfaces
- Set up and manage application prioritization
- Deploy and manage the entire SD-WAN deployment



User Management

- FortiCloud integrated single-sign on, secure 2FA controls, and external IDP support
- Fine grained access control for IAM Users and APIs. Access to audit logs for compliance



Security Analytics and Reporting

- View cloud log analysis and visibility to traffic, security, event logs, and FortiView monitors
- Set up event handlers and schedule from curated reports



Multitenancy

- Manage multiple customers with hierarchal tenant structure
- User management with access controls
- Central visibility for admins to manage tenant network



FortiGate Cloud Subscription

- FortiGate Cloud offers subscription for cloud management, security analytics, and one-year hosted log retention
- Devices without subscription are limited to seven days of logs, one report, and no cloud config management

Challenges

How FortiGate Cloud Addresses Key Security Challenges

Challenge	Solution
Facilitating turnkey provisioning of FortiGates at remote sites when on-site configuration expertise is unavailable.	FortiGates include FortiGate Cloud registration functionality in their firmware that allows an individual or multiple devices to provision themselves with minimal on-site expertise.
Keeping initial investment costs down and preference for consumption-based, OPEX model.	FortiGate Cloud uses Software-as-a-Service (SaaS) model that eliminates the need for upfront capital purchases.
Maintaining a single pane of glass management for overseeing security infrastructure.	FortiGate Cloud provides control over FortiGates while providing granular visibility and reporting at the same time.
Investing in a future-proof security solution that will scale with your business.	FortiGate Cloud can grow as your business grows and will accommodate additional log storage as needed.
Deploying different configurations across multiple sites and setup access control.	Role-based access control provides flexibility in managing users. Multitenancy enables the management of customers and users with simplicity and ease.



Features

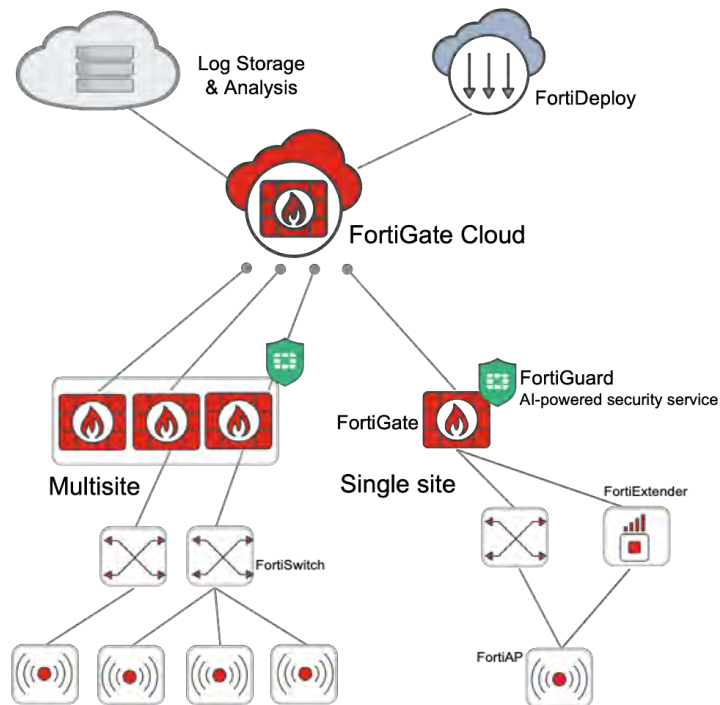
Zero Touch Provisioning

Initial configuration of firewalls, switches, and access points can be a tricky proposition, often requiring expert staff on-site to configure each device individually. Zero touch provisioning greatly simplifies local or remote onboarding of devices for the initial configuration. FortiCloud key provides an easy mechanism to import FortiGates into FortiGate Cloud with the automatic connection of FortiGates to be managed by FortiGate Cloud.

Hundreds of FortiGates can be provisioned using a bulk FortiCloud key in distributed environments, such as large retail or education networks. Once a communication tunnel is established, FortiGate Cloud provisions the FortiGate to the designated account, enabling settings, cloud logging, and device management from the cloud.

Configuration and Device Management from a Single Pane of Glass

Consistent configuration of devices within your network is essential for ensuring that security policies are correctly applied. FortiGate Cloud provides a web-based management console to control FortiGates and downstream connected devices. Device settings such as SD-WAN interfaces/SLAs/rules, IP addresses, or service set identifiers (SSIDs) can be configured for FortiGate Cloud managed devices. Configuration backups are kept in FortiGate Cloud to assist with replacement or recovery efforts. Device firmware updates and scripts can be performed on multiple FortiGates, enabling automation and allowing customers to take advantage of the latest features.



FortiGate Cloud Network Security Management

Features continued

Fabric Integration with FortiSwitch, FortiAP, and FortiExtender

FortiGate Cloud has the added benefit of provisioning, configuring, and managing your extended infrastructure through the FortiGate. Not only can you manage your entire infrastructure from a single cloud management interface, but by allowing FortiGate to manage your FortiSwitch, FortiAP, and FortiExtender, it can extend its functionality into them.

For example, the switch ports inherit the same properties as the firewall, making them extensions of the firewall — the same principle goes for the FortiAP. This unique Fabric integration enables this cross-product functionality. It can further allow automation in the face of a threat. When an infected client is detected through Indicators of Compromise (IOCs), the switch or AP can block the device until the problem is remediated.

Deployment and Management of SD-WAN

Deploying SD-WAN need not be a complicated and expensive endeavor — FortiGate Cloud allows you to roll out and manage your SD-WAN deployment easily using zero touch deployment through its interface either manually or automatically as the FortiGates come online. Once your interfaces are up, you can move on to setting up the SD-WAN rules to optimize application prioritization on the WAN interfaces.

Account and User Management

Providing secure access to administrators for managing the FortiCloud account, assets, and services is a key factor in efficient operations. FortiGate Cloud provides granular resource-based access controls to reduce security risks by assigning only the necessary permissions to carry out specific tasks for designated personnel. Integrated with FortiCloud IAM (Identity and Access Management), secure 2FA authentication, permission profiles for authorization, admins can securely control access to FortiCloud assets and features for your users. Additionally, integrated with FortiCloud external IdP, customers can leverage external IdP user management and manage access to FortiGate Cloud.

Instant Security Intelligence and Analytics

To place better security controls on your network, you must first know how it is being utilized. FortiGate Cloud's extensive set of dashboards gives you an immediate view of FortiGate usage, including a breakdown of network traffic and bandwidth usage. FortiGate Cloud analytics provides you with drill-down and filtering functionality to instantly determine how applications, websites, users, and threats impact your network.



Features continued

Hosted Log Retention and Cloud-based Storage

Log retention is an integral part of any security and compliance best practice, but administering a separate storage system can be burdensome and costly. FortiGate Cloud takes care of this automatically and stores your valuable log information securely in the cloud.

Depending on your device, you can easily store and access different logs, including traffic, system, web, applications, and security events. FortiGate Cloud provides seven days of log retention for devices without subscription while the subscription service extends this to one full year of logs.

Exceptional Network Visibility with FortiGate Cloud Reporting

A periodic review of network and security activity is essential to keep costs down and security breaches at bay. Reporting allows you to be proactive about optimizing your network and satisfying executive staff scrutiny. FortiGate Cloud provides preconfigured reports to give you the information you need for your specific reporting and compliance requirements. A wide variety of rich canned reports such as a 360-degree Activity Report, Fortinet Security Best Practices Report, Application Usage Report, or Cyber Threat Assessment Report, amongst others, can be run on-demand or scheduled (daily, weekly, or monthly), giving you complete visibility with actionable outcomes. Devices without subscription receive only the 360-degree Activity Report.

Multitenancy Management

Large scale tenant management requires mature and complex deployment structures with increased flexibility and a streamlined process for resource provisioning in different locations for customers. FortiGate Cloud multitenancy can be leveraged via FortiCloud Organizations. FortiCloud Organizations based multitenancy provides unified tenant management across FortiCloud services and helps to structure accounts, assets, and implement fine-grained access controls across multiple accounts. FortiGate Cloud provides a centralized dashboard for the Organization and Organizational Units with visibility of the tenant accounts, devices, licenses, easy access to manage tenant network and security.

FortiGate Cloud Transport Security and Service Availability

FortiGate Cloud encrypts all communication including log information between your FortiGate devices and the cloud. Fortinet deploys redundant data centers to give the FortiGate Cloud service its high availability. Fortinet has also used its years of experience in protecting sophisticated networks worldwide to implement operational security measures that make sure your data is secure and only you can view or retrieve it.



Ordering Information

FortiGate Cloud Subscription

FortiGate Cloud subscription per device is available for FortiGates (40 ~ 3700 series), FortiGate-VM/VM-S series, and FortiWiFi (40 ~ 81 series) for cloud management, analytics, and one year rolling log storage.

Product	SKU	Description
FortiGate Cloud Subscription	FC-10-00XXX-131-02-DD	FortiGate Cloud Management, Analysis, and One Year Log Retention (XXX = model code)

Multitenancy

Regular FortiCloud accounts can enable multitenancy with FortiCloud Organizations up to 10 accounts with no license needed. For more than 10 accounts use FortiCloud Premium License.

Product	SKU	Description
FortiCloud Premium	FC-15-CLDPS-219-02-DD	FortiCloud Premium License to enable Multitenancy with FortiCloud organizations.

Note: FNDN accounts has access to unlimited accounts in FortiCloud Organizations without any license.

For customers who would like to add bulk provisioning for multiple devices, add the following SKU to the purchase order*.

Product	SKU	Description
FortiDeploy	FDP-SINGLE-USE	Enables zero touch bulk provisioning for your FortiGate, FortiWiFi, or FortiAP products with FortiGate Cloud. Must be purchased with every PO.

* This feature is only available on devices running FortiOS 5.2.2 and above.

Visit <https://www.fortinet.com/resources/ordering-guides> for related ordering guides.



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cnWave™ 60 GHz V2000

Client Node

QUICK LOOK:

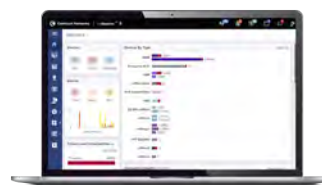
- Supports 57 to 66 GHz
- Up to 3.6 Gbps (1.8 Gbps DL and 1.8 Gbps UL). Channel bonding typically doubles capacity
- Auto-beamforming, +/- 10° horizontal, +/- 4.0° vertical
- 2.5 GbE PoE input AND 2.5 GbE 802.3at PoE output port for powering external devices
- 802.11ay standard technology with Terragraph certification



Designed for high-speed and high-density deployments

Cambium Networks' cnWave 60 GHz solution provides easy, fast and cost-effective wireless gigabit connectivity for edge access and/or high-capacity backhaul for edge access solutions at a significantly lower TCO than fiber infrastructure. Service providers and enterprises now have access to gigabit for business and residential connectivity, backhaul for Wi-Fi access or LTE/5G small cell. cnWave solutions are highly efficient at handling high-density deployments in cities and suburban areas.

The V2000 features a 2.5 GbE PoE input port as well as a 2.5 GbE PoE 802.3at output port for powering Wi-Fi access points or video surveillance cameras. This makes the V2000 especially well-suited to backhaul Cambium's XV2 series of outdoor Wi-Fi AP's.



Cloud and on-premises management

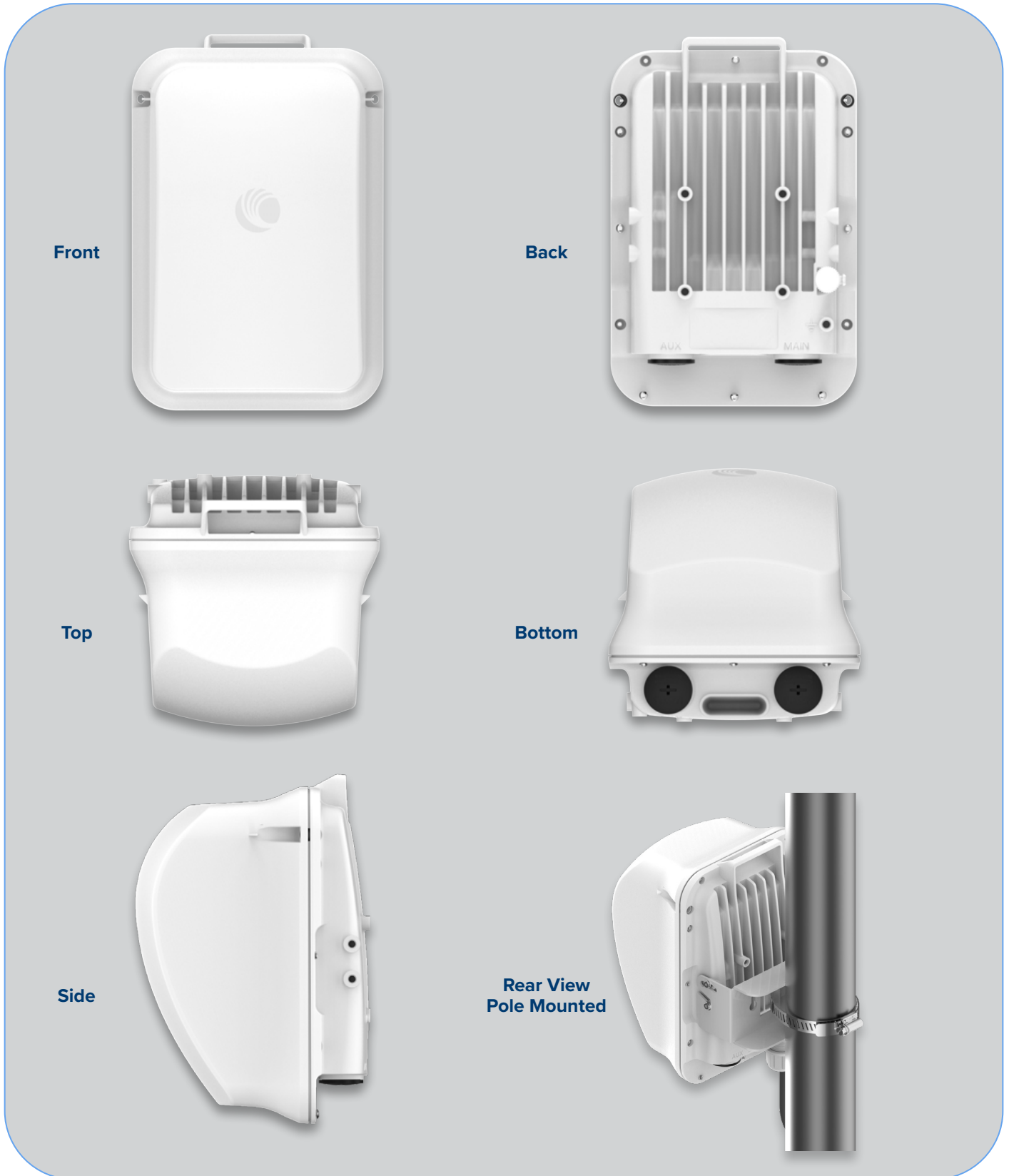
cnWave 60 GHz operates with Cambium Networks' cnMaestro management system. cnMaestro™ is a cloud-based or on-premises software platform for secure, end-to-end network control. cnMaestro wireless network manager simplifies device management by offering full network visibility and zero-touch provisioning. View and perform a full suite of wireless network management functions in real time. Optimize system availability, maximize throughput and meet emerging needs of business and residential customers.

cnWave™ 60 GHz V2000 Client Node

Specifications

Spectrum		Antenna	
Frequency Range	57 to 66 GHz in a single SKU	Gain	34.5 dBi
Channel Width	2.16 GHz, 4.32 GHz*	Type	Integrated
Channel Bonding*	Up to 2 adjacent channels	Beamforming Scan Range	+/- 10° azimuth, +/- 4.0° elevation
Mode of Operation	PMP Client or PTP	Powering	
Interface		Type	802.3at
Channel Access	TDMA/TDD	Power Consumption	18W (48W when using PoE output port)
Ethernet Interface	1 x 2.5 GbE PoE Input 1 x 2.5 GbE PoE 802.3at Output	Physical	
Networking		Environmental	IP66/67
Protocols Supported	IPv4, IPv6, Layer2 Bridge, Layer3 IPv6 Routing, Open/R Distributed Networking	Temperature	-40°C to 60°C (-40°F to 140°F)
Network Management	cnMaestro, HTTP, HTTPS, SNMP v2c & v3	Mean Time Between Failure	> 40 years
MTU	1,900 bytes	Weight	1.9 kg (4.2 lbs.) with bracket
VLAN	802.1ad (QinQ), 802.1Q with 802.1p priority	Dimensions H x W x D	249 x 166 x 220 mm (9.8 x 6.5 x 8.7 in)
Security		Wind Survival	200 km/h (124 mph)
Encryption	128-bit AES	Performance	
Firmware Security	Signed Firmware Images	Modulation & Coding Schemes	MCS-0 (BPSK) to MCS-12 (16-QAM-3/4)
Performance		Latency	< 1 ms
Maximum EIRP	49 dBm		

cnWave™ 60 GHz V2000 Client Node



cnWave™ 60 GHz V2000 Client Node

cnWave 60 GHz V2000 Ordering Information

C600500C020B	60GHz cnWave V2000 Client Node 30W with US cord
C600500C026B	60GHz cnWave V2000 Client Node 30W with Israel cord - Israel Only
C600500C027B	60GHz cnWave V2000 Client Node 30W with South Africa cord
C600500C028B	60GHz cnWave V2000 Client Node 30W with India cord
C600500C029B	60GHz cnWave V2000 Client Node 30W with no cord
C600500C030B	60GHz cnWave V2000 Client Node, no power supply and no power cord
C600500C031B	60GHz cnWave V2000 Client Node 30W with EU cord
C600500C032B	60GHz cnWave V2000 Client Node 30W with UK cord
C600500C033B	60GHz cnWave V2000 Client Node 30W with ANZ cord
C600500C034B	60GHz cnWave V2000 Client Node 30W with Brazil cord
C600500C035B	60GHz cnWave V2000 Client Node 30W with Argentina cord

cnMaestro Management Ordering Information

MSX-SUB-T4-1	cnMaestro X for cnWave: Advanced management and includes CC Pro for Tier4; 1-year subscription / Tier4 device; Tier4 device include Client Node
MSX-SUB-T4-3	cnMaestro X for cnWave: Advanced management and includes CC Pro for Tier4; 3-year subscription / Tier4 device; Tier4 device include Client Node
MSX-SUB-T4-5	cnMaestro X for cnWave: Advanced management and includes CC Pro for Tier4; 5-year subscription / Tier4 device; Tier4 device include Client Node



cnWave™ 60 GHz V2000 Client Node

Extended Warranty, Cambium Care and cnMaestro Management Ordering Information

EW-E1CNWV2000-WW	60 GHz V2000 Extended Warranty, 1 Additional Year
EW-E2CNWV2000-WW	60 GHz V2000 Extended Warranty, 2 Additional Years
AR-E0CNWV2000-WW	60 GHz V2000 Upgrade to All Risks Advanced Replacement Program during 3-year standard warranty
AR-E1CNWV2000-WW	60 GHz V2000 All Risks Advance Replacement, 1 Additional Year
AR-E2CNWV2000-WW	60 GHz V2000 All Risks Advance Replacement, 2 Additional Years
CCADV-SUP-V2000-1	Cambium Care Advanced, 1-year support for one V2000. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-V2000-3	Cambium Care Advanced, 3-year support for one V2000. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-SUP-V2000-5	Cambium Care Advanced, 5-year support for one V2000 . 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-V2000-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support for one V2000. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-V2000-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support for one V2000. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-V2000-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support for one V2000. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCPRO-SUP-V2000-1	Cambium Care Pro, 1-year support for one V2000. 24x7 TAC support, SW updates
CCPRO-SUP-V2000-3	Cambium Care Pro, 3-year support for one V2000. 24x7 TAC support, SW updates
CCPRO-SUP-V2000-5	Cambium Care Pro, 5-year support for one V2000. 24x7 TAC support, SW updates
CCPRM-SUP-V2000-1	Cambium Care Prime, 1-year support for one V2000. 24x7 TAC SLA support, SW updates, and ARAR for HW
CCPRM-SUP-V2000-3	Cambium Care Prime, 3-year support for one V2000. 24x7 TAC SLA support, SW updates, and ARAR for HW
CCPRM-SUP-V2000-5	Cambium Care Prime, 5-year support for one V2000. 24x7 TAC SLA support, SW updates, and ARAR for HW

About Cambium Networks

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences, and device connectivity, with compelling economics. Our ONE Network platform simplifies management of Cambium Networks' wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We deliver connectivity that just works.

cambiumnetworks.com

06222023

cnWave™ 60 GHz V3000

High-Gain Client Node

QUICK LOOK:

- Supports 57 to 66 GHz
- Up to 3.6 Gbps (1.8 Gbps DL and 1.8 Gbps UL). Channel bonding typically doubles capacity
- Easy installation with auto-beamforming
- Low latency < 1 ms
- 802.11ay technology with Terragraph certification



Designed for long-range, high-capacity and high-density deployments

Cambium Networks' cnWave 60 GHz solution provides easy, fast and cost-effective wireless gigabit connectivity for edge access and/or high-capacity backhaul for edge access solutions at a significantly lower TCO than fiber infrastructure. Service providers and enterprises now have access to gigabit for business and residential connectivity, backhaul for Wi-Fi access or LTE/5G small cell. Certified for Facebook Terragraph, cnWave solutions are highly efficient at handling high-density deployments in cities and suburban areas.

V3000 is featured with a 44.5 dBi or 40.5 dBi high-gain antenna with beamforming. The Client Node (CN) can be used as either a client in PMP configurations or an end-point in PTP configurations.



Cloud and on-premises management

cnWave 60 GHz operates with Cambium Networks' cnMaestro management system. cnMaestro™ is a cloud-based or on-premises software platform for secure, end-to-end network control. cnMaestro wireless network manager simplifies device management by offering full network visibility and zero-touch provisioning. View and perform a full suite of wireless network management functions in real time. Optimize system availability, maximize throughput and meet emerging needs of business and residential customers.

cnWave™ 60 GHz V3000 Client Node

Specifications

Spectrum

Frequency Range	57 to 66 GHz in a single SKU
Channel Width	2.16 GHz, 4.32 GHz*
Carrier Bonding*	Up to 2 adjacent channels
Mode of Operation	PMP Client or PTP

Interface

Channel Access	TDMA/TDD
Ethernet Interface	1 x 100/1000/10G BaseT with PoE In, 1 x 100/1000 BaseT with 802.3at PoE Out, 1 x SFP+ 1G and 10G

Networking

Protocols Supported	IPv4, IPv6, Layer2 Bridge, Layer3 IPv6 Routing, Open/R Distributed Networking
Network Management	cnMaestro, HTTP, HTTPS, SNMP v2c & v3
MTU	1,900 bytes
VLAN	802.1ad (QinQ), 802.1Q with 802.1p priority

Security

Encryption	128-bit AES
Firmware Security	Signed Firmware Images

Performance

Modulation & Coding Schemes	MCS-0 (BPSK) to MCS-12 (16-QAM)
Latency	< 1 ms
Maximum EIRP	60.5 dBm (with 44.5 dBi Antenna) 54.5 dBm (with 40.5 dBi Antenna)

Antenna

Gain	44.5 dBi or 40.5 dBi
Type	Integrated
Beamforming Scan Range	+/- 2° azimuth, +/- 1° elevation
Beam Width	0.8°

Powering

Type	Passive PoE (42-57V) without AUX PoE Out in use
Power Consumption	60 W with AUX PoE Out in use, 30 W without AUX PoE Out in use

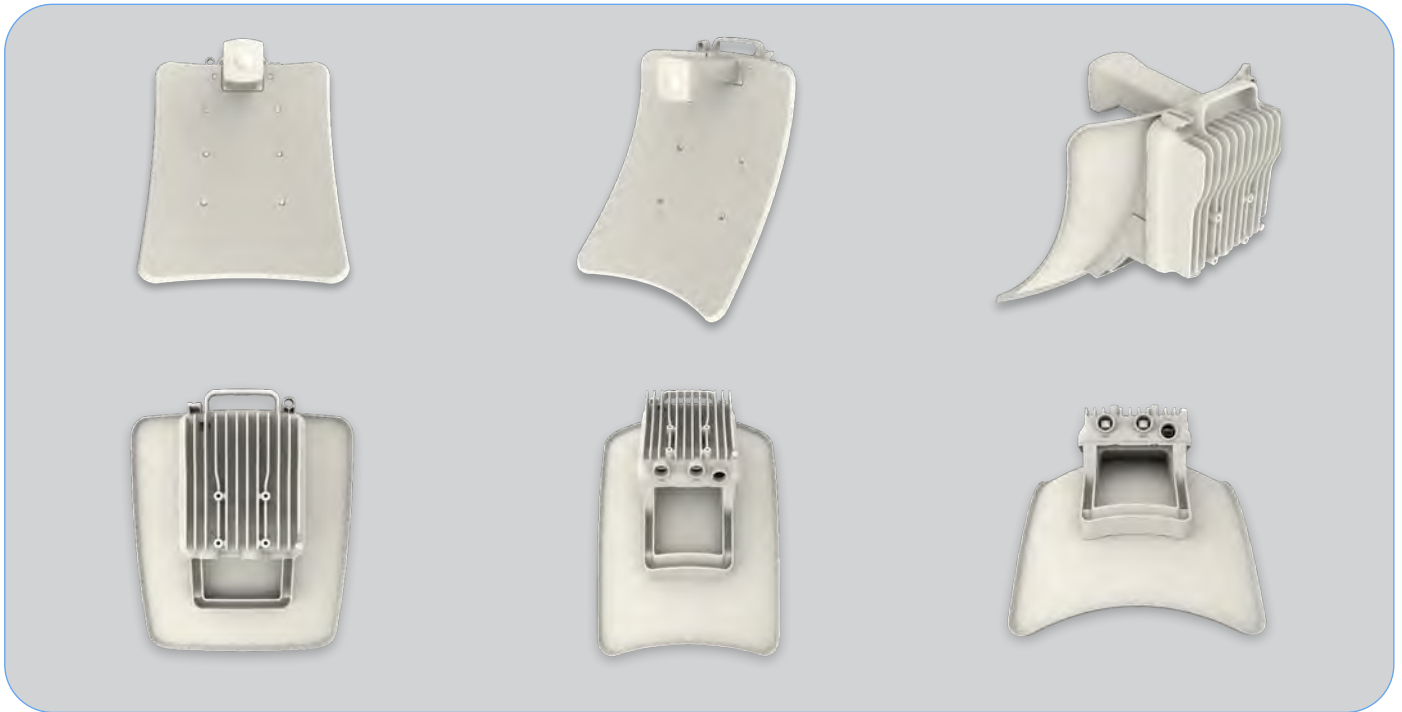
Physical

Environmental	IP66/67
Temperature	-40°C to 60°C (-40°F to 140°F)
Mean Time Between Failure	> 40 years
Weight	V3000 with 44.5 dBi dish 4.7kg (10.3 lbs.) without clamp V3000 with 40.5 dBi dish 3.9kg (8.6 lbs.) without clamp
Dimensions H x W x D	V3000 with 44.5dBi dish 421 x 347 x 349 mm (16.57 x 13.66 x 13.7 in) V3000 with 40.5dBi dish 343 x 198 x 251 mm (13.5 x 7.8 x 9.9 in)
Wind Survival	200 km/h (124 mi/h)

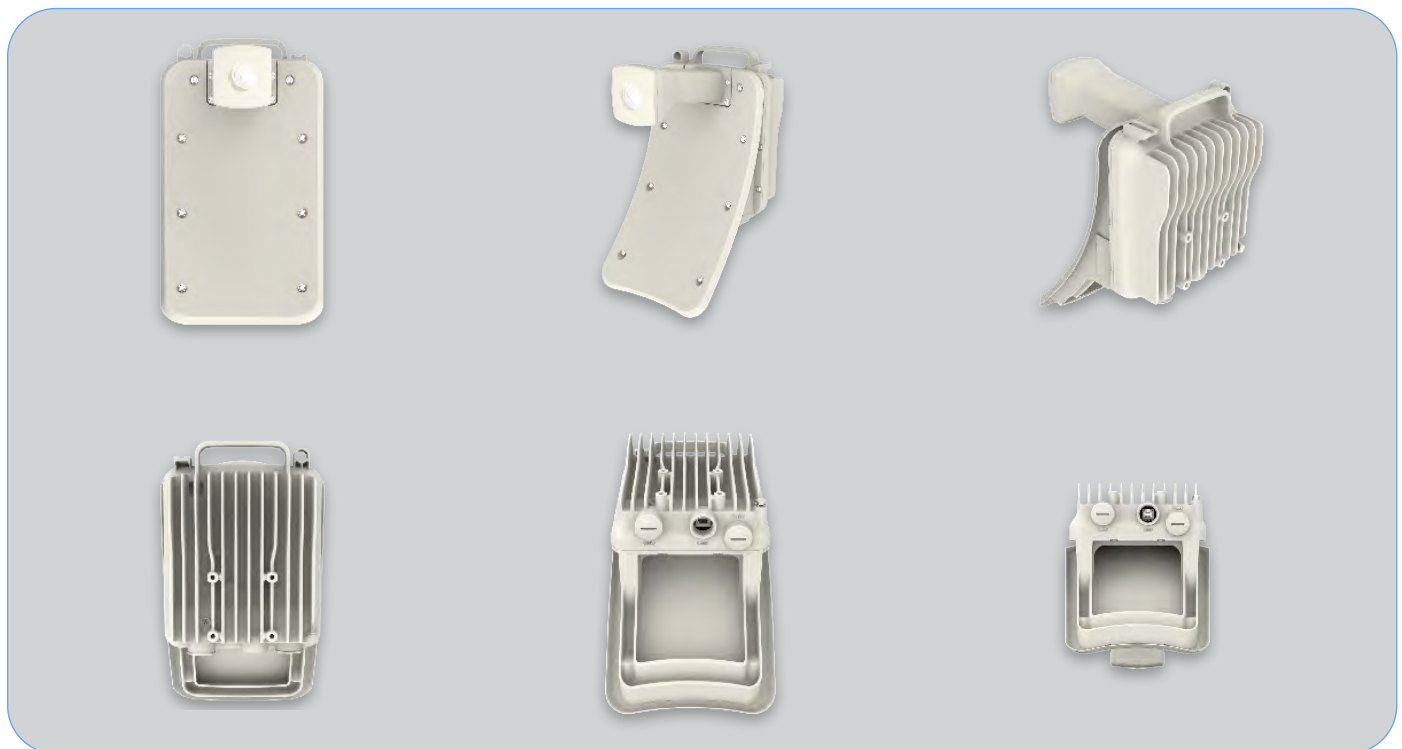
* Available in future release

cnWave™ 60 GHz V3000 Client Node

V3000 with 44.5 dBi Antenna



V3000 with 40.5 dBi Antenna



cnWave™ 60 GHz V3000 Client Node

Ordering Information

C600500C024A	cnWave 60 GHz V3000 Client Node Radio Only
C600500C025A	cnWave 60 GHz V3000 Client Node Radio Only - Israel Only
C600500D002A	cnWave 60 GHz V3000 Client Node Antenna Assembly, 40.5 dBi, 4 Pack
C600500D003A	cnWave 60 GHz V3000 Client Node Antenna Assembly, 44.5 dBi, 4 Pack
N000045L002A	Tilt Bracket Assembly
C000000L125A	cnWave Precision Mounting Bracket

NOTE: Power Supply Unit must be ordered separately.

ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.

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06062023

cnWave™ 60 GHz V5000

Distribution Node

QUICK LOOK:

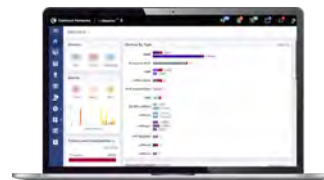
- Supports 57 to 66 GHz
- Dual-sector with 280° coverage
- Up to 7.2 Gbps (1.8 Gbps DL and 1.8 Gbps UL per sector). Channel bonding typically doubles capacity
- TDMA/TDD channel access and Network Synchronization
- 802.11ay technology with Terragraph certification



Designed for high-speed and high-density deployments

Cambium Networks' cnWave 60 GHz solution provides easy, fast and cost-effective wireless gigabit connectivity for edge access and/or high-capacity backhaul for edge access solutions at a significantly lower TCO than fiber infrastructure. Service providers and enterprises now have access to gigabit for business and residential connectivity, backhaul for Wi-Fi access or LTE/5G small cell. Certified for Facebook Terragraph, cnWave solutions are highly efficient at handling high-density deployments in cities and suburban areas.

V5000 is featured with two sectors covering up to 280° with beamforming. A single V5000 can connect up to four other distribution nodes or up to 30 client nodes. V5000 can be used for PTP and PMP configurations.



Cloud and on-premises management

cnWave 60 GHz operates with Cambium Networks' cnMaestro management system. cnMaestro™ is a cloud-based or on-premises software platform for secure, end-to-end network control. cnMaestro wireless network manager simplifies device management by offering full network visibility and zero-touch provisioning. View and perform a full suite of wireless network management functions in real time. Optimize system availability, maximize throughput and meet emerging needs of business and residential customers.

cnWave™ 60 GHz V5000 Distribution Node

Client Node Model				
	V1000	V2000	V3000 44.5 dBi	V3000 40.5 dBi
Maximum Throughput in DL or UL	1 Gbps	1.8 Gbps	1.8 Gbps 2.7 Gbps with CB2	1.8 Gbps 2.7 Gbps with CB2
Maximum EIRP	38 dBm	49 dBm	60.5 dBm	54.5 dBm

Specifications

Spectrum

Frequency Range	57 to 66 GHz in a single SKU
Channel Width	2.16 GHz, 4.32 GHz*
Carrier Bonding*	Up to 2 adjacent channels
Mode of Operation	PMP or PTP

Interface

Channel Access	TDMA/TDD
Ethernet Interface	1 x 100/1000/10G BaseT with PoE In, 1 x 100/1000 BaseT with 802.3at PoE Out, 1 x SFP+ 1G and 10G

Networking

Protocols Supported	IPv4, IPv6, Layer2 Bridge, Layer3 IPv6 Routing, Open/R Distributed Networking
Network Management	cnMaestro, HTTP, HTTPS, SNMP v2c & v3
MTU	1,900 bytes
VLAN	802.1ad (QinQ), 802.1Q with 802.1p priority

Security

Encryption	128-bit AES
Firmware Security	Signed Firmware Images

* Available in future release

Performance

Modulation & Coding Schemes	MCS-0 (BPSK) to MCS-12 (16-QAM)
Latency	< 1 ms
Maximum EIRP	38 dBm

Antenna

Gain	22.5 dBi
Type	Integrated
Beamforming Scan Range	+/- 140° azimuth, +/- 20° elevation
Beam Width	12°

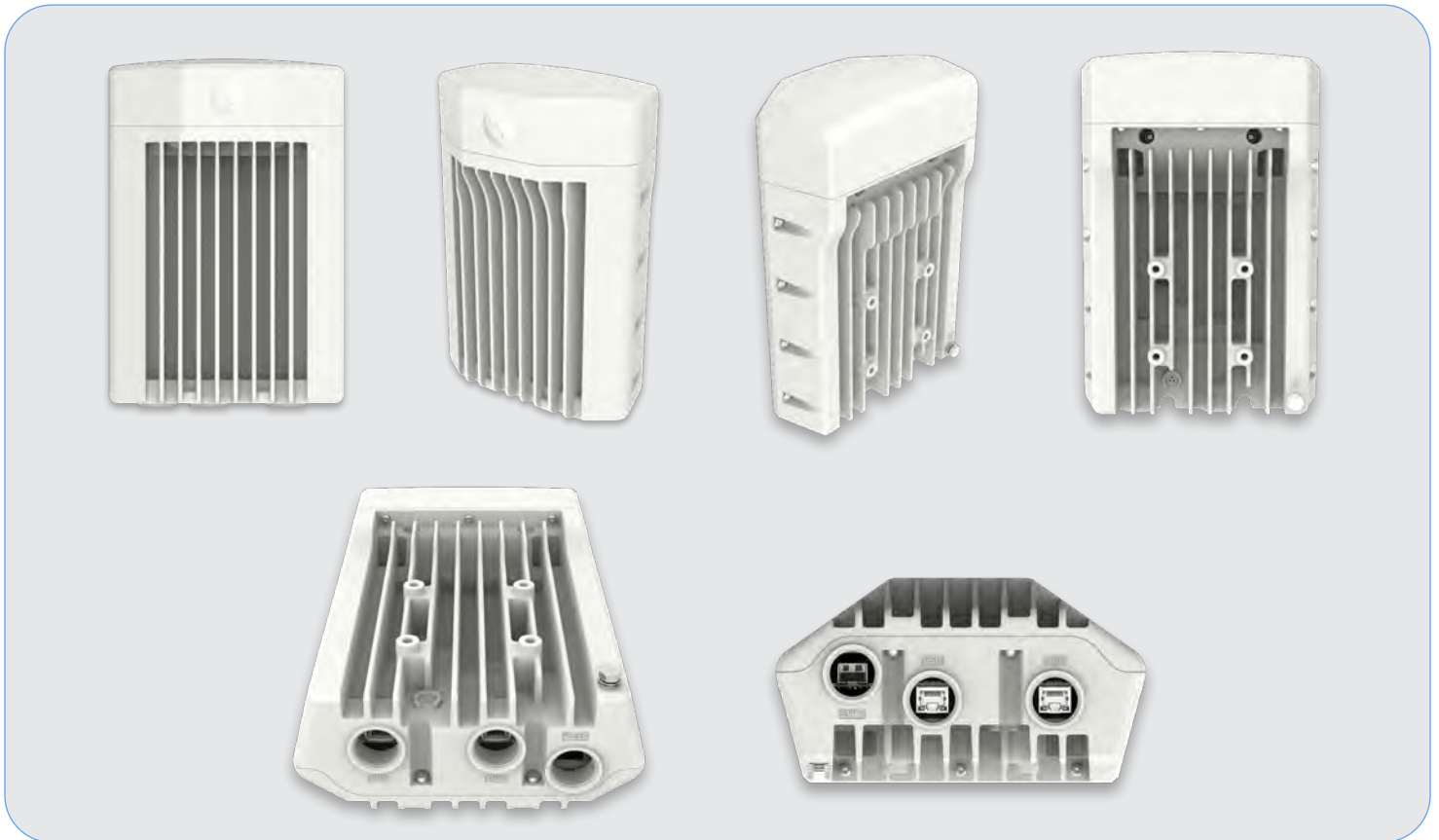
Powering

Type	Passive PoE (42-57 V)
Power Consumption	65 W with AUX PoE Out in use, 35 W without AUX PoE Out in use

Physical

Environmental	IP66/67
Temperature	-40°C to 60°C (-40°F to 140°F)
Mean Time Between Failure	> 40 years
Weight	< 4 kg (8.8 lbs)
Dimensions H x W x D	280 mm x 186 mm x 103 mm (11.0 in x 7.32 in x 4.06 in)
Wind Survival	200 km/h (124 mi/h)

cnWave™ 60 GHz V5000 Distribution Node



Ordering Information

C600500A004B cnWave 60 GHz V5000 Distribution Node

C600500A005B cnWave 60 GHz V5000 Distribution Node - Israel Only

C000000L136A Universal Wall Mount Bracket

C000000L137A Universal Pole Mount Bracket for 1 inch to 3 inch diameter poles

NOTE: Power Supply Unit must be ordered separately.

About Cambium Networks

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences, and device connectivity, with compelling economics. Our ONE Network platform simplifies management of Cambium Networks' wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We deliver connectivity that just works.

cambiumnetworks.com

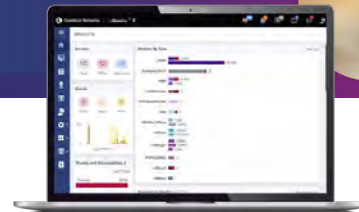
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XE3-4TN Wi-Fi 6/6E Access Point

802.11ax Tri-Radio 2x2/4x4 (2+2+4) Access Point with N-type Antenna Connectors

XE3-4TN Quick Look

- Tri-radio/tri-band Wi-Fi 6/6E
- Software-defined 5 GHz/6 GHz radio
- AFC compliant for 6 GHz operation*
- 6.6 Gbps aggregate data rate
- 2.5 GbE and 1 GbE uplink ports
- Outdoor-rated IP67 enclosure



Outdoor High-Density, Future-Proof Wi-Fi

The XE3-4TN is an outdoor-rated tri-radio Wi-Fi 6/6E 2x2/4x4 access point (AP) designed to deliver future-proof performance and value for building next-generation networks. Wi-Fi 6 delivers faster and more efficient wireless network connections than previous-generation Wi-Fi technologies. Wi-Fi 6E extends the capacity of Wi-Fi into the 6 GHz band, more than tripling the wireless spectrum available.

Software-Defined Radio Provides Flexibility

The software-defined radio (SDR) provides flexibility to match the capability of the connected clients and to match the regulatory limits in the 6 GHz band. Where 6 GHz outdoor is not allowed, operate the XE3-4TN in dual 5 GHz mode to expand capacity in the allowed 5 GHz channels. Where 6 GHz outdoor is allowed, and Wi-Fi clients support it, use tri-radio mode to dramatically increase density in a reduced RF interference environment.

3-Year Warranty

The XE3-4TN comes with an industry-leading 3-year hardware warranty, providing return and repair service on the access point and multiple tiers of customer support, from the business day to extended hours and advanced replacement.

Cloud or On-premises Management

The XE3-4TN is supported by Cambium Networks' ONE Network enterprise architecture managed by the cnMaestro™ Network Management System. cnMaestro uses a distributed intelligence architecture with cloud-first management and edge-intelligent Wi-Fi that self-optimizes for the RF environment. cnMaestro delivers a single-pane-of-glass management experience for enterprise Wi-Fi APs, cnMatrix™ Ethernet Switches, NSE Service Edge, residential service provider routers, Cambium's fixed wireless access solutions, and Cambium Fiber.

*Automatic frequency coordination (AFC) is under development and will be a cloud service that will assign operating channel and power. AFC is required for 6 GHz operation outdoors.

XE3-4TN Wi-Fi 6/6E Outdoor Access Point

Access Point Specifications*			
FCC	Ch 1–11, 36–64, 100–144, 149–165	Power	Typical power 25W (802.3at) Maximum power 62W with PoE out enabled and sourcing 30W Passive PoE output: 30V or 48V nominal at up to 30 Watts
ISED	Ch 1–11, 36–64, 100–116, 149–165		
ETSI*	Ch 1–13, 36–64, 100–140, 149–173		
ROW*	Ch 1–14, 36–64, 100–144, 149–177	Dimensions	220mm x 200mm x 86mm (8.66 in x 7.87 in x 3.39 in)
6 GHz Channel	FCC/IC/ROW: Ch 1–233 EU: 1–93	Weight	2,920 g (6.44 lb)
		MTBF	498,910 hours @ 25°C 132,618 hours @ 65°C
Radios	5 GHz/6 GHz 802.11a/n/ac/ax, 4x4 SW configurable 5 GHz 802.11 a/n/ac Wave 2/ax, 2x2 2.4 GHz 802.11 b/g/n/ax, 2x2 BLE 4.1, GPS receiver	Mount Options	Pole or wall mount
		Security	Kensington lock slot
		LEDs	Multi-color status LEDs
Wi-Fi	802.11 a/b/g/n/ac/ax	Ambient Operation Temperature	-40°C to 65°C (-40°F to 149°F)
SSID Security	WPA3-SAE, WPA3-Enterprise, WPA2-PSK (CCMP, AES, 802.11i), WPA2-Enterprise (802.1x/EAP), OSEN, Owe, Open	Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Max PHY Rate	5/6 GHz radio 4,804 Mbps 5 GHz radio 1,201 Mbps 2.4 GHz radio 573.5 Mbps	Humidity	95% RH non-condensing
Ports	1 x IEEE 100/1000/2500 Mbps Ethernet 1 x IEEE 10/100/1000 Mbps Ethernet with PoE out	Certifications	WiFi Alliance 80211a/b/g/n/ac/ax, PP2.0 FCC, ETSI, CE, IC, IEC60950, IEC62368, EN61373, EN50121, EN 303 413 (GPS), IEC 60068-2-5 (solar radiation), IEC 60529 (ingress protection), TAA
Max EIRP	Radio 1: 2x2 2.4 GHz = 28dBm Radio 2: 2x2 5 GHz = 28dBm Radio 3: 4x4 5 GHz/6 GHz = 25dBm The cable loss and antenna gain are separate from any radio conducted power specification. Please refer to the Antenna Guide for more details.		

*Individual country limits may apply.

XE3-4TN Wi-Fi 6/6E Outdoor Access Point

Network Specifications*

Operational Modes	Controllerless standalone Cloud-managed cnMaestro or VM	RF Management	Multi-modal RF optimization supporting AutoRF for dynamic channel selection and dynamic power adjustment configured via cnMaestro, performed in the intelligent edge AP Out-of-band RF spectrum analysis RF monitor with channel utilization/packet error rate/interference
WLAN	1,500 per AP 16 SSIDs per AP	Band Steering	Yes
Security Authentication Encryption	Open, WPA2-AES with PSK, ePSK and Enterprise WPA3 with PSK (WPA3-SAE), ePSK, Enterprise, Enterprise-CNSA, OWE (Enhanced Open) OSEN and PMF (802.11 W) MAC authentication with local database or external database using RADIUS protocol 802.1X with EAP-TTLS, EAP-TLS/MSCHAPv2, PEAPv0/PEAPv1 /EAP-PEAP/EAP-SIM/AKA/AKA'/FAST Hotspot WEB authentication	Mesh	Multi-hop, all 3 bands
Wi-Fi Quality of Service	WMM (packet marking either with 802.1p or IP DSCP), WMM-PS, U-APSD Multicast to unicast conversion	Scheduled WLAN	On/off by day, week, time of day
Service Availability	Critical network resource monitor with SSID shutdown	Data Limit	Client bitrate/time/throughput limit per SSID
Fast Roaming	802.11k/r/v, OKC, cnMaestro-assisted roam	Network	TCP connection log, NAT logging firewall, DHCP server, VLAN pooling, RADIUS attribute, VID VLAN per SSID per user, ePSK with VLAN assignment per PSK
Guest Access/Captive Portal	cnMaestro-hosted EasyPass portal Multiple authentication methods supported to onboard guest user: <ul style="list-style-type: none"> • Radius-based authentication • Click-through with simple terms and conditions acceptance • Social login using Google®, Facebook® • SMS-based authentication (X) • Voucher-based access • Microsoft® Azure AD and Google • Workspace® (X) • Sponsored guest access (X) • Self-registration access (X) cnMaestro API support for external captive portal integration 802.11u, Hotspot 2.0	Network Tools	Wired or wireless remote packet capture, logging, WAN speed test, ZapD, remote network connectivity tools
Accounting	RADIUS accounting, multiple AAA	Tunnel	L2TPv2, L2GRE, PPPoE
		VLAN	802.11Q, max 4096
		Management Interfaces	HTTP/HTTPS web interface, SSH, Telnet
		IP	IPv4, IPv6
		Security	Rogue AP detection and termination (X), WIDs/WIPs, DoS protection L2–L7 firewall with application visibility (X) and control (X), DNS-based access control (X) ACL and AirCleaner tools
		Services	Wi-Fi calling control, NTP, Syslog, DNS proxy, SNMP traps, SNMPv1, SNMPv2c, SNMPv3, TCP and DNS logging
		API	RESTful management and statistics API via cnMaestro X, presence location push APIs

*Some features will be included in subsequent firmware releases.

Standards

Wi-Fi Protocols	Data Coding support 16/64/256/1024/4096-QAM Channel width support 5GHz and 6GHz band: 20/40/80/160 MHz TWT, Long OFDM Symbol, Transmit beam steering, Airtime Fairness, AMSDU, AMPDU, RIFS, STBC, LDPC, MIMO Power Save, MRC, BPSK, QPSK, CCK, DSSS, OFDM, MU-OFDMA, UL/DL MU-MIMO, VHT rates IEEE 802.11 a/ac/ax/b/d/e/g/h/i/lj/k/n/r/s/u/v/w
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XE3-4TN Wi-Fi 6/6E Outdoor Access Point

Management



cnMaestro uses a distributed intelligence architecture with cloud-first management and edge-intelligent APs that self-optimize for the RF environment. cnMaestro delivers a single pane-of-glass management for Cambium broadband fixed wireless, cnMatrix Ethernet Switches, enterprise-grade Wi-Fi APs, NSE Service Edge, and residential service provider routers.

cnMaestro can be deployed on cloud or on-premises via a virtual machine.

To serve a growing market for advanced management and services functionality, Cambium Networks offers cnMaestro in two management tiers:

cnMaestro X

Paid subscription that includes:

- Advanced device management capabilities
- Deep packet inspection (DPI) application visibility and Control for 2,400+ apps
- RESTful management and statistics API
- Presence location push APIs
- Graphic reports
- Webhooks
- Cambium Care Pro for 24x7 technical support
- Accelerated access to L2 engineers and regular software updates

Assists

- Assesses the network's configuration and identifies weak security settings and proposes a fix to ensure the network configuration is up to the top security industry standards

cnMaestro Essentials

License-free cloud management that delivers a disruptive total cost of ownership (TCO) for organizations of all sizes. Includes EasyPass for OneClick or voucher-based connection as well as WiFi4EU access.

X Assurance

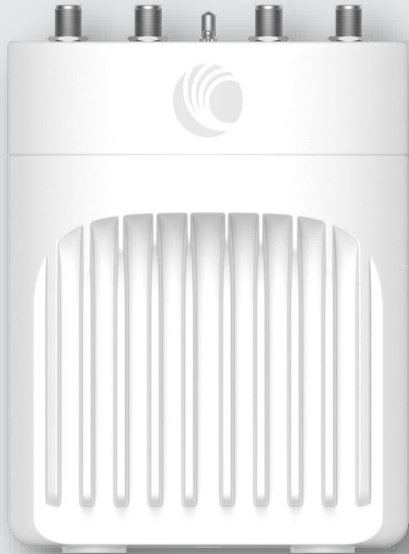
- Helps to quickly identify network-wide connectivity issues by isolating every element of the client's lifecycle, either radio or network related
- Gives an overview quality index of the network and highlights each element's contribution to easily identify the worst offender
- Provides insight of probable causes and proposes fixes for the administrator to apply
- Provides individual client connectivity visibility throughout the entire lifecycle of its connection to easily identify each connection's result and highlight the failure reason, should there be any

EasyPass Portal with Additional Options

- Self-registration: Form-based access
- Sponsored guest: Guest ambassador-based access
- Paid access: Monetize the Wi-Fi access
- Microsoft Azure: Corporate user login
- Google Login: Web login using Google accounts

**Find out more about
cnMaestro**

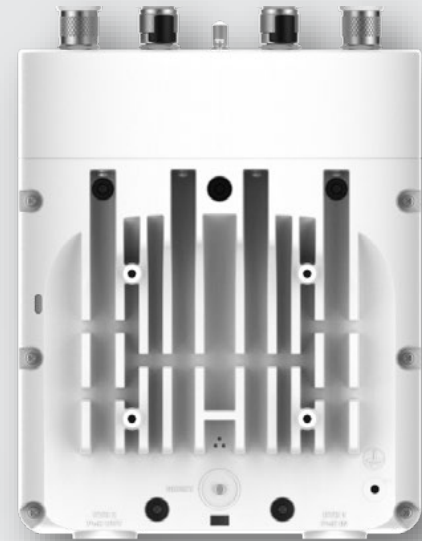
XE3-4TN Wi-Fi 6/6E Outdoor Access Point



Front



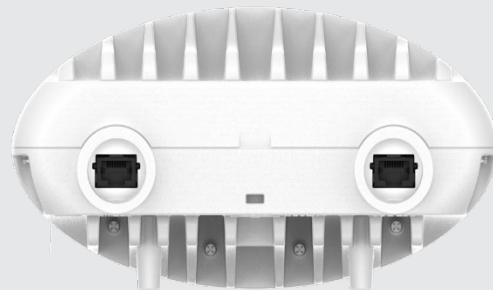
Side



Back



Top



Bottom

XE3-4TN Wi-Fi 6/6E Outdoor Access Point

XE3-4TN Ordering Information

XE3-4T	Regulatory Model
XE3-4TN0A00-US	XE3-4TN Outdoor Wi-Fi 6E 4x4 SDR Access Point, 2.5 GbE, US
XE3-4TN0A00-EU	XE3-4TN Outdoor Wi-Fi 6E 4x4 SDR Access Point, 2.5 GbE, EU
XE3-4TN0A00-RW	XE3-4TN Outdoor Wi-Fi 6E 4x4 SDR Access Point, 2.5 GbE, 6 GHz radio disabled, RW
XE3-4TN0A06-RW	XE3-4TN Outdoor Wi-Fi 6E 4x4 SDR Access Point, 2.5 GbE, 6 GHz radio enabled, RW
XE3-4TN0A00-CA	XE3-4TN Outdoor Wi-Fi 6E 4x4 SDR Access Point, 2.5 GbE, CA
C000000L141A	PoE, 60W, 56V, 10GbE DC Injector, Indoor, Energy Level 6 Supply, accepts C5 connector
N000000L034B	PoE injector, 30.5W, 56V, 5GbE DC Injector, Indoor, Energy Level 6 Supply, accepts C5 connector

Antenna Ordering Information*

ANT-OM-1X1-05	Tri-Band 2.4 GHz/5 GHz/6 GHz, 5 dBi, omni-directional 1x1 antenna with N-male connector
ANT-D30-2X2-02	Dual-band 2.4/5GHz 2x2 MIMO directional 60deg 6/7.5dBi
ANT-D35-4X4-01	Dual band 5 GHz/6 GHz, 13 dBi, 35° beamwidth 4x4 antenna with N-female connectors, bracket included, cables sold separately
ANT-D60-2X2-02	Dual-band 2.4/5GHz 2x2 MIMO directional 30deg 11.5/14dBi
ANT-D60-4X4-02	Dual band 5GHz/6GHz, 11dBi, 60 degree beamwidth 4x4 antenna with N-female connectors, bracket included, cables sold separately
ANT-GPS-01	GPS antenna
ANT-CB-10MM-03	Antenna cable N-type M to M, LMR400, 3m, qty 1 cable
ANT-CB-10MM-04	Antenna cable N-type M straight to N-type M Right Angle-LMR400, 3m, Qty 1 cable

*See XE3-4TN [Antenna Guide](#) for more details.

Download Antenna
Selection Guide

cnMaestro X Ordering Information

MSX-SUB-XE3-4TN-1	cnMaestro X for one XE3-4TN AP. Creates one Device Tier 3 slot. Includes Cambium Care Pro support. 1-year subscription
MSX-SUB-XE3-4TN-3	cnMaestro X for one XE3-4TN AP. Creates one Device Tier 3 slot. Includes Cambium Care Pro support. 3-year subscription
MSX-SUB-XE3-4TN-5	cnMaestro X for one XE3-4TN AP. Creates one Device Tier 3 slot. Includes Cambium Care Pro support. 5-year subscription

XE3-4TN Wi-Fi 6/6E Outdoor Access Point

Cambium Care Ordering Information

CCADV-SUP-XE3-4TN-1	Cambium Care Advanced, 1-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support, SW updates, and NBD advance replacement for HW
CCADV-SUP-XE3-4TN-3	Cambium Care Advanced, 3-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support, SW updates, and NBD advance replacement for HW
CCADV-SUP-XE3-4TN-5	Cambium Care Advanced, 5-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support, SW updates, and NBD advance replacement for HW
CCPRO-SUP-XE3-4TN-1	Cambium Care Pro, 1-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support and SW updates
CCPRO-SUP-XE3-4TN-3	Cambium Care Pro, 3-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support and SW updates
CCPRO-SUP-XE3-4TN-5	Cambium Care Pro, 5-year support for one XE3-4TN Wi-Fi 6/6E AP. 24x7 TAC support and SW updates
CCADV-UPG-XE3-4TN-1	Cambium Care Advanced Add-on to cnMaestro X, 1-year support for one XE3-4TN. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-XE3-4TN-3	Cambium Care Advanced Add-on to cnMaestro X, 3-year support for one XE3-4TN. 24x7 TAC support, SW updates, and NBDS advance replacement for HW
CCADV-UPG-XE3-4TN-5	Cambium Care Advanced Add-on to cnMaestro X, 5-year support for one XE3-4TN. 24x7 TAC support, SW updates, and NBDS advance replacement for HW

LIMITED WARRANTY

Cambium Networks XE3-4TN Wi-Fi 6/6E Access Point includes
a 3-year hardware warranty.

ABOUT CAMBIUM NETWORKS

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences and device connectivity with compelling economics. Our ONE Network platform simplifies management of Cambium Networks' wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We make connectivity that just works.

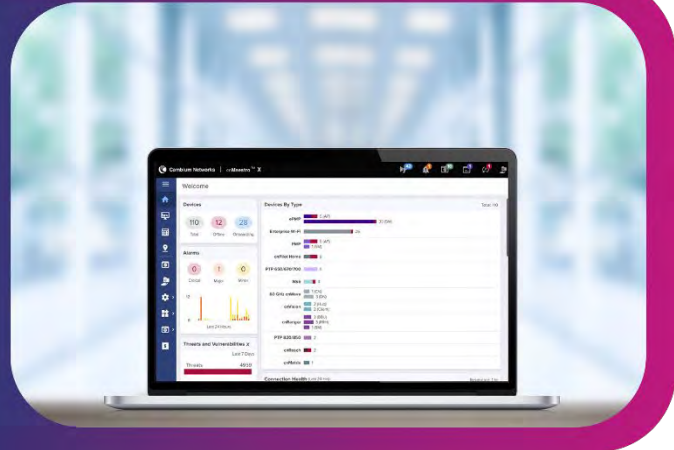
cambiumnetworks.com

cnMaestro™ X Management System

cnMaestro Quick Look

A simple, yet sophisticated AI-based network management system for Cambium Networks wireless and wired solutions.

- Elastic scalability in a single-pane-of-glass experience for Cambium’s ONE Network
- Secure, end-to-end network management with zero-touch provisioning
- Simplified operations and ongoing maintenance for the network administrator



Devices
Total: 90, Offline: 45, Onboarding: 5

Alarms
Period: Last 24 Hours
Critical: 3, Major: 54, Minor: 24

Threats and Vulnerabilities
Period: Last 7 Days
Threats: 0, Unique Vulnerabilities: 62

Assists X
Period: Last 24 Hours
68% Good
Failure: 17, Passed: 13

Devices By Type
Total: 90
Enterprise Wi-Fi: 52, cnMatrix: 13, NSE: 10, RV22 Home Mesh: 5, PMP: 1 (AP), 3 (SM), ePMP: 1 (AP), 3 (SM), cnPilot Home: 2

Connection Health
Period: Last 24 Hours, Resolution: 1 Hour

Top Managed Accounts
Period: Last 5 Minutes

Name	Total	Down	Devices By Type
01_ABC_Corp (OneNetwork)	30	11	
T14_GHH_Cloud	18	7	
T09_Cal_Tech	17	17	

What's New in 5.2.0
Enterprise
• Client Data History Retention increased to 30 Days.
• EasyPass Onboarding (ePSK Cloud)
• MarketApps Enhancements

Key Highlights

- Single console for your entire Cambium network: Wi-Fi, switching, fixed wireless, security, and SD-WAN
- Simple and easy-to-navigate user interface for fast time to productivity
- Powerful AI-based tools for drill down troubleshooting and rapid problem resolution
- Flexible integration via APIs and Webhooks for third party extensibility and customization
- Includes Cambium Care Pro software support with 24x7 L2 engineer access and all software updates for cnMaestro and managed devices

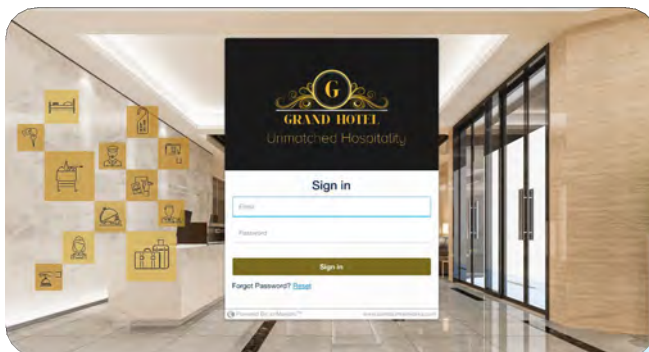
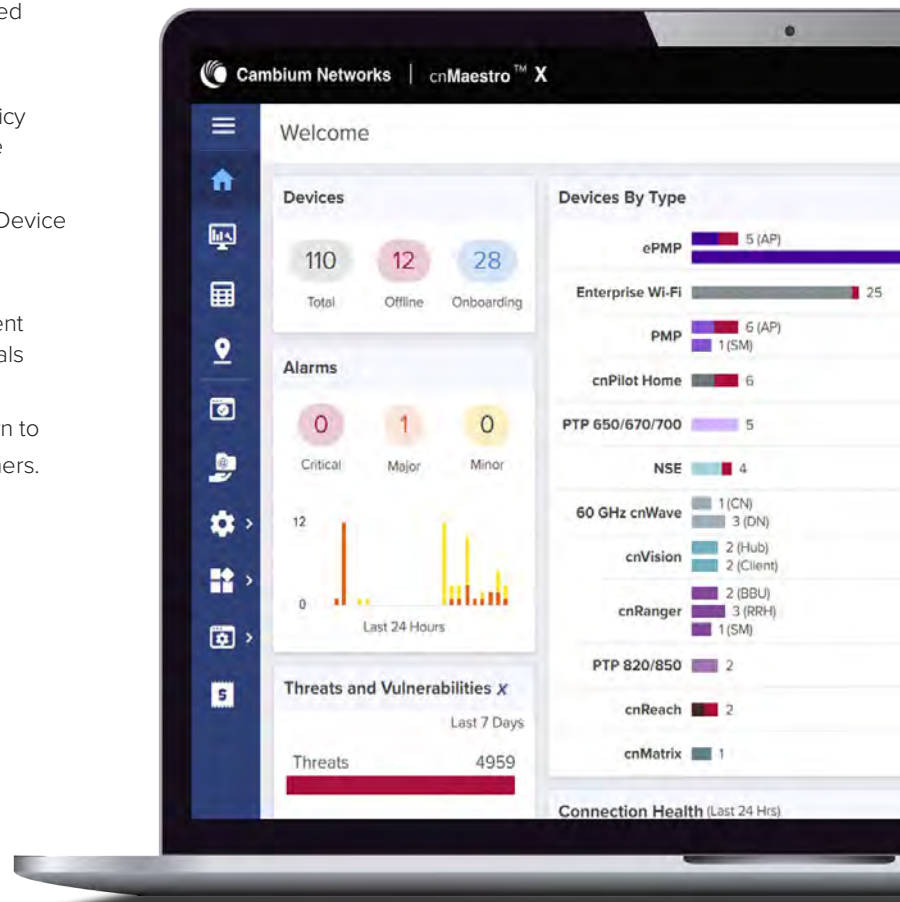
Note: cnMaestro X is an account level construct and all devices in the account require a cnMaestro X subscription.



cnMaestro™ X Management System

Advanced Functionality in cnMaestro X

- X Assurance provides AI-powered analytics to identify and fix wireless network issues, helping IT admins improve user experience by proactively finding root cause of problems.
- EasyPass offers diverse Wi-Fi onboarding options for employees, guests, attendees, and IoT, featuring advanced captive portals and one-year client login history.
- Application visibility and control provides analytics and policy control for 2400+ applications at the Wi-Fi and WAN edge
- Advanced cnMatrix switch features including QinQ, Auto Device Recovery (ADR) and cable diagnostics
- Customizable MSP dashboard with ability to create different brands with multi-tier customizations including guest portals
- Consolidated MSP tenant statistics with ability to drill down to manage a specific tenant without impacting data from others. Support for up to 200 managed tenants.
- Restful APIs and Webhooks for integration with existing OSS/BSS systems and event monitoring
- Assists function scans device configurations to identify potential vulnerabilities and recommends improvements to save time troubleshooting.
- Long-term historical data retention: 2-year data for FWB and 1-year data for Enterprise and IIoT devices
- RADIUS, TACACS+, LDAP, and AD Login for user administration



cnMaestro X allows MSPs to create a custom branding experiences for their customers.

cnMaestro™ X Management System

Key Functionalities

- Zero-touch provisioning: Create, provision, monitor and manage the entire network of wireless and wired devices from a single dashboard login with key performance metrics, alarms, and alerts. The cloud-first UI design is easy to learn and apply across the portfolio and helps network administrators simplify operations and deliver an optimal client experience.
- With centralized visibility and control for Cambium Networks' wireless and wired products, network administrators can quickly and easily deploy networks with minimal training. Whether you work on small sites or large distributed networks with thousands of sites, cnMaestro makes deployment and operations easy. Administrators have access to information needed to enforce policies and optimize performance. Remote support capability is integrated into the architecture, along with powerful help desk tools to debug remote issues without going onsite. Troubleshooting tools such as ping, traceroute, throughput, and live packet captures are included, dramatically reducing resolution times and enabling remote troubleshooting.
- Deployment flexibility and TCO: Choice of public cloud, private cloud, or on-premises deployment with best TCO. cnMaestro helps reduce operating costs and accelerate return on investment. cnMaestro does not require Wi-Fi controllers, thereby reducing the complexity and cost of deploying Wi-Fi networks.
- Built for scale and security at all levels: Devices connect to cnMaestro Cloud using SSL-enabling deployments without changes to the firewall configuration. Cambium Intelligent edge architecture enables fault-tolerant networks where the network continues to operate even when the cloud is unreachable due to a WAN outage. With cnMaestro X, you can manage networks with up to thousands of sites, and up to 25,000 devices.
- Tailored views for enterprise, access and backhaul, and IIoT: The access and backhaul view provides visualization and control of devices from service provider towers to the network edge.
- Supports network hierarchy, enabling easy configuration, monitoring, and debugging at network nodes to reduce operational costs. This is especially critical for large networks or small distributed networks with small on-site IT staff.
- Provides a bird's-eye view of network health with insights on performance, connectivity, and client experience. Administrators can quickly identify potential trouble spots and drill down from network to client-level details.
- Extensible platform for managing third-party endpoints.
- cnMaestro X supports the following Cambium solutions:
 - » Wi-Fi 6/6E/7 Access Points (APs)
 - » cnPilot™ E-series and R-series APs
 - » Xirrus XD, XH, XA, and XR 11ac APs
 - » cnMatrix™ EX1000/2000/3000, and TX1000/2000 Series Switches
 - » Network Service Edge (NSE)
 - » cnWave™ 60 GHz and 28 GHz
 - » PTP (point-to-point)
 - » PMP and ePMP™ (point-to-multipoint)
 - » PON
 - » cnReach
 - » cnRanger™

cnMaestro On-Premises Server Requirements	Resources	Enterprise	Fixed Wireless	Enterprise and Fixed Wireless
	8vCPUs, 16 GB RAM, 250 GB Hard Disk	10,000 Enterprise devices (Wi-Fi, cnMatrix, NSE)	20,000 Fixed Wireless devices (PMP, ePMP, PTP, cnReach, cnRanger)	10,000 total devices – Fixed Wireless and Enterprise (PMP, ePMP, PTP, PON, Wi-Fi, cnMatrix, NSE)
	16vCPUs, 32 GB RAM, 500 GB Hard Disk	25,000 Enterprise devices (Wi-Fi, cnMatrix, NSE)	40,000 Fixed Wireless devices (PMP, ePMP, PTP, cnReach, cnRanger)	25,000 total devices Fixed Wireless and Enterprise (PMP, ePMP, PTP, PON, Wi-Fi, cnMatrix, NSE)

cnMaestro™ X Management System

Product Summary *Features marked X require cnMaestro X subscription*

Onboarding & Provisioning

- Zero-touch onboarding
- Template configuration
- Object configuration (enterprise)
- Claim PMP SMs associated with AP
- cnMaestro Installer installation summary upload (PMP & ePMP) **X**
- Mass provisioning for ePMP/PMP/cnWave 60 GHz (using LINKPlanner) **X**
- Webhooks support **X**

Network Services

- Branded tenant login page **X**
- Support for software-defined radios (SDR) on XV3-8, XE3-4, & XE5-8 Wi-Fi 6 APs
- ePSK Types
- ePSK Types
 - o ePSK Local – ePSKs are cached locally on the Wi-Fi APs
 - 2,000 per WLAN (Wi-Fi 6+)
 - 300 per WLAN (Wi-Fi 5)
 - o ePSK RADIUS – ePSKs are limited via external radius server **X**
 - o ePSK Cloud – ePSKs are unlimited & cloud managed (Wi-Fi 6+) **X**
- Personal Wi-Fi **X**
- Number of guest portals: 500 **X**
- EasyPass
 - o One-click
 - o Sponsored guest **X**
 - o Voucher
 - o Paid **X**
 - Payment gateway **X**
 - » PayPal
 - » IPPay
 - » QuickPay
 - » mPesa
- WiFi4EU
- Azure guest portal **X**
- Google authentication **X**
- Self-registration: SMS & email **X**
- Onboarding **X**
- Combined options
- Max number of login events: Unlimited event records for 30 days **X**
- Max number of guest client sessions at a time: 10,000 **X**
- Max number of managed devices: **X**
 - 25,000 for enterprise
 - 40,000 for FWB
- Application visibility & control of over 2,400 different applications across the Wi-Fi access network **X**

Wi-Fi

- Simplified wireless LAN view
- Stateful firewall support
- Dynamic channel listing based on country, release, & SKU
- AP group & WLAN configuration
- Site support for collocated APs
- WIDS support **X**

X Assurance **X**

- Client connection lifecycle monitoring & analysis
- Root cause analysis of connection & service failures
- Network-wide client health monitoring & scoring

NOTE: X Assurance is available in cnMaestro X Cloud, but not in cnMaestro X On-Premises.

Troubleshooting & Forensics

- Tower-to-edge view
- Technical support dump export
- Rogue AP detection
- Wi-Fi packet capture
- ePMP/PMP link test
- Cambium Care Pro – 24/7 technical support, accelerated access to L2 engineers, & software updates/upgrades **X**

Security

- Communication over SSL
- No Inbound internet access
- Not-in-traffic path
- Disaster recovery

Deployment

- Cloud-hosted, delivered as a service
- Customer-hosted VMware OVA
- Amazon Marketplace AMI

Visualization

- Full Visibility across network
- Supports ePMP, cnMatrix, enterprise & residential Wi-Fi, PMP, PTP, cnReach, cnRanger
- Multiple product views
 - o Access & backhaul view
 - o Enterprise wireless view
 - o Industrial internet view
- Hierarchical device tree
- PMP/ePMP sector display
- Spectrum analyzer: PMP **X**
- cnWave 60GHz Interference Scan **X**

Configuration & Monitoring

- Redundant cloud services
- Scheduled system backup
- Automatic bulk software update
- Dedicated device dashboards
- Statistics & trending
- Email alerts
- Supporting concurrent device jobs **X**
- Configuration lock **X**
- Managed service provider accounts **X**
- Support for up to 200 accounts
- High availability (1+1) for On-Premises **X**
- Monitor Wi-Fi performance from client or AP to cnMaestro (On-Premises NMS; Cloud NMS – N/A) **X**
- Assists for cnMatrix, Wi-Fi, cnPilot-R, PMP, ePMP, cnWave 5G Fixed, & PTP 670/700 **X**

Data & Reporting

- Statistics reports exported in CSV
- Export UI tables in CSV or PDF **X**
- RESTful monitoring/provisioning API **X**
- Graphical reports **X**
- Long-term data retention **X**
 - o 2 years for FWB
 - o 1 year for enterprise & IIoT

Administration

- Management users: 200 **X**
- Role-based access
- Auto-provisioning **X**
- RADIUS, TACACS+, LDAP, & AD login **X**
- Advanced troubleshooting **X**
 - o Audit logs
 - o Audit syslog & event syslog (On-Premises NMS; Cloud NMS – N/A)
- Advanced monitoring **X**
 - o Session management
 - o User authentication (On-Premises NMS; Cloud NMS – N/A)
- cnWave 60 GHz MAP features
 - o Extensive network map RF link visualization **X**
 - o Auto-manage route
- Open ID/SAML authentication **X**

MarketApps **X**

- Managed Wi-Fi
- Self-Service Personal Wi-Fi

cnMatrix

- Zero-touch remote provisioning
- Policy-based automation (PBA) on EX2000/EX3000
- Cambium Sync on TX series
- DHCP client/server
- Automated voice VLAN
- Assists **X**
- QinQ **X**
- Auto-device recovery
- Cable diagnostics **X**
- PBA on EX1000 **X**
- MAC lists & location services for PBA **X**

Network Service Edge (NSE)

- Site-to-site VPN
- WAN flow preferences
- DHCP/RADIUS/DNS services
- Load balancing
- WAN QoS
- Firewall
- LAN vulnerability assessment
- Granular content filtering
- WAN failover policy & IP groups
- High Availability

cnMaestro™ X Management System

cnMaestro X Part Numbers

Tier	Product		cnMaestro X Subscription SKU
Free Tier	ePMP Hotspot	1000 Hotspot	No subscription needed
	cnPilot Home	All R-Series APs	
	cnRanger	All SM Models	
	cnVision	MAXr, MAXrp, MICRO, MINI	
	cnWave 60 GHz	All Client Nodes	
	ePMP	All SM Models	
	PMP	All SM Models	
Tier 3	Enterprise Wi-Fi	All cnPilot E-Series, XE/XV/X7-Series and Xirrus (AOS) APs	MSX-SUB-[Model]-1/3/5*
Tier 5	60 GHz cnWave	All Distribution Nodes	MSX-SUB-T5-1/3/5
Tier 6	cnWave 5G Fixed	All CPE Models	MSX-SUB-T6-1/3/5
Tier 7	cnWave 5G Fixed	All BTS Models	MSX-SUB-T7-1/3/5
Tier 20	cnMatrix	All cnMatrix Switches	MSX-SUB-[Model]-1/3/5*
Tier 21	cnVision	FLEXr, HUB360	MSX-SUB-EPMP-1/3/5
	ePMP	All AP Models	
Tier 22	PMP	All AP Models except 450m and 450mv	MSX-SUB-PMP450i-1/3/5
Tier 23	PMP	450m	MSX-SUB-PMP450m-1/3/5
Tier 24	cnRanger	All BBU Models	MSX-SUB-PTP-1/3/5
	cnReach	All cnReach Models	
	PTP	All PTP Models	
Tier 30	NSE	NSE 3000	NSE-SUB-3000-1/3/5**
Tier 60	RV22 Home Mesh	RV22	RV-SUB-22-1/3/5**

*cnMatrix Switches and Wi-Fi APs:

These products use model-based SKUs for subscription.

For Wi-Fi access points, the corresponding cnMaestro X SKU follows a specific format:

The base part of the SKU will be ""MSX-SUB-"" followed by the model name of the access point (e.g., XV2-21X).

The ending part will be ""-1/3/5"", indicating the subscription term duration (1, 3, or 5 years).

Similarly, for cnMatrix switches, the cnMaestro X SKU follows the same format based on the switch model name (e.g., EX3024F)

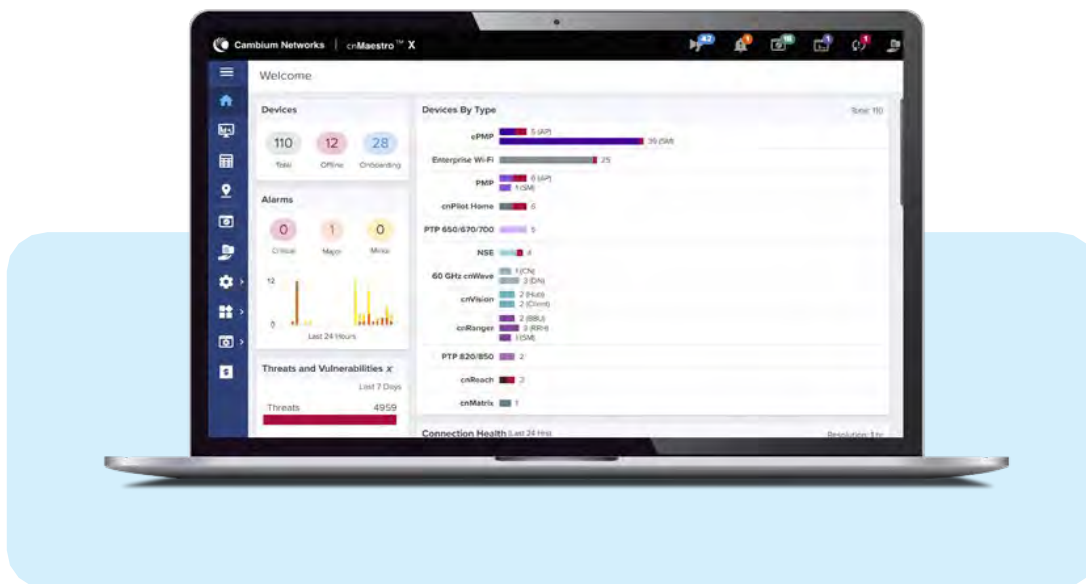
For example:

The SKU for 3-year cnMaestro X subscription for XV2-21X AP and a 5-year cnMaestro X subscription for an EX3024F switch would be:

SKU	Description
MSX-SUB-XV2-21X-3	cnMaestro X for one XV2-21X AP. Creates one Device Tier3 slot. Includes Cambium Care Pro support. 3-year subscription
MSX-SUB-EX3024F-5	cnMaestro X for one EX3024F. Creates one Device Tier20 slot. Includes Cambium Care Pro support. 5-year subscription

** Unlike other products, NSE3000 & RV22 devices need a subscription to be used on either cnMaestro X or cnMaestro Essentials.

cnMaestro™ X Management System



GET STARTED at

cloud.cambiumnetworks.com

Free 90-day trial of cnMaestro X:

cambiumnetworks.com/cnmaestro-x

ABOUT CAMBIUM NETWORKS

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences and device connectivity with compelling economics. Our ONE Network platform simplifies management of Cambium Networks’ wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We make connectivity that just works.

cambiumnetworks.com

USE DNS AS A CYBER DEFENSE



DNS is a critical component of internet infrastructure. **Roughly 80% of threats use DNS** during an attack, making it an incredibly effective part of your cyber defense.

Stop threats **BEFORE** they enter your network using DNS by identifying the query and stopping the response. *DNSFilter uses proprietary machine learning to analyze and re-analyze websites to keep up with the ever dynamic world wide web.* Over 260 million domains categorized across 40 content categories and 9 threat categories. We block 9 million threats daily using DNS.

175+ SERVERS

in over **89** DATACENTERS
across **69** CITIES in **48**
COUNTRIES worldwide

SPEED, THE BACKBONE OF THE INTERNET

DNS is expected to be fast and reliable—DNSFilter provides that and more. DNSFilter has the world's fastest Dual Anycast Network with global distribution across 69 cities and 48 countries. You could be doing anything on the Internet, we'll make whatever it is happen faster.

POSSIBLY THE EASIEST SECURITY SOLUTION TO SET UP

Setup in <1 hour → Start Blocking in Minutes

FASTER THAN THE REST



THREAT IDENTIFICATION ACCURACY

61% of the threats we identify, other threat intelligence systems don't.



FASTEST NETWORK IN NORTH AMERICA

Our queries take just 6.67 ms - faster than Cloudflare, Cisco, and Google.



CATCH ZERO-DAY THREATS

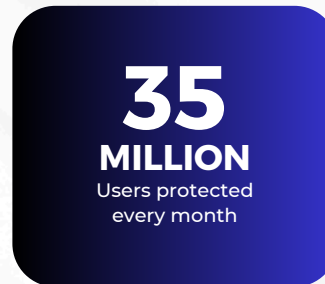
We catch new threats roughly 10 days before traditional threat feeds.



QUICK DEPLOYMENT

68% of our customers are up and running in under a week.

DNSFILTER MAKES A BIG IMPACT



GET IN TOUCH

dnsfilter.com

(877) 331-2412

sales@dnsfilter.com

APPAWARE

Increase security and boost productivity with AppAware's application blocking and usage intelligence features. One-click blocking of the 100 most high-risk applications. Plus, intelligence reporting and insights into the usage of the applications throughout your organization so you can make data-driven decisions.

DATA EXPORT

Our Data Export feature allows customers to export data from DNSFilter to another tool in near real-time. This external tool can be a data store, data visualization service, analytics service, logging service, and more. This ability opens a whole new world of custom integrations and data analysis that can help customers with decision making, network troubleshooting, and building extensions on top of the core DNSFilter features.

SINGLE SIGN-ON (SSO)

Our SSO feature enables you to securely access your DNSFilter account with a single click by taking advantage of third-party identity providers like Okta and Azure AD that support the OpenID Connect (OIDC) protocol.

ACTIVE DIRECTORY INTEGRATION

It's easier to manage policies when you can use what you already have in place. Our Sync tool gives you the ability to directly integrate with Active Directory and Azure Directory. We provide an automatic full sync of both security and dynamic groups, supporting up to 500,000 users.

ADVANCED REPORTING

Uncovering anomalies, monitoring network behavior, discovering who wins "the-most-likely-to-visit-a-phishing-site" award - those are a few of the outcomes when you leverage DNSFilter's advanced reporting. You'll have access to scheduled reporting so you can stay on top of the big picture, but also drill into the finer details. Discover trends among your customers and don't miss a surge in suspicious behavior.

INTEGRATIONS

Perform automated tasks based on events happening on your DNSFilter account with our Zapier integration or dedicated API. Initiate workflows and send DNS data to over 3,000 applications in Zapier and beyond. Get automated alerts when customers encounter a deceptive site, hit a block page, or when an administrator adds (or removes) a new Roaming Client. Our integration capabilities help you manage repetitive tasks by setting up automation to handle events you need to monitor.

MALICIOUS DOMAIN PROTECTION

Stop threats 10 to 50+ days faster using machine learning to analyze DNS queries to determine how likely they are associated with a malicious host. Malicious Domain Protection's classifier was trained using over 16 million queries.



Eliminate Cellular Coverage Issues with SignalRoam

SignalRoam is an innovative carrier-integrated service designed to eliminate poor cellular coverage within buildings by utilizing your existing Wi-Fi infrastructure. This solution is ideal for chief technology officers and administrators of campus networks in hospitals, schools, universities, and hospitality venues.

Seamless Connectivity

SignalRoam enables subscribers of multiple mobile services to connect securely and seamlessly to a single network without compromising security. This eliminates the need for users to manually connect to public Wi-Fi networks, thereby reducing security risks while increasing visitor overall satisfaction. Currently AT&T and T-Mobile are supported with more to come in 2024.

Leverage Existing Wi-Fi Infrastructure

By leveraging your robust existing Wi-Fi network, SignalRoam ensures that mobile service for your staff, guests, or students is as strong as the nearest Wi-Fi access point. This approach negates the need for additional funding for expensive equipment, antennas, installation, or ongoing support.

Cost-Effective and Easy to Implement

SignalRoam offers a flat service fee per building, which includes:

- Configuration of your existing network
- Approved connections to all carriers and mobile network operators supported by SignalRoam
- Authentication and transport infrastructure
- A comprehensive dashboard to view usage statistics

Immediate Deployment and Affordable Solution

SignalRoam provides an effortless and cost-effective solution to your cellular coverage issues, with an immediate deployment schedule. Enhance your campus network today with SignalRoam and ensure seamless, secure, and robust mobile connectivity for all users.

Unified Connectivity for Visitors

- **Secure Authentication:** Securely connect visitor smartphones using existing Wi-Fi networks, with no additional equipment needed.
- **Carrier Integration:** Wi-Fi calling and Passpoint® adoption ensure immediate service improvement and reduced complaints.

Comprehensive Solution Suite

- **Robust Reporting:** Access detailed usage reports, internal alerts, and 24/7 NOC support through our online portal.
- **High Security:** Passpoint® standard provides security equivalent to cellular networks, with automatic, seamless connections.

Effortless Implementation

- **Quick Setup:** Configure Passpoint in 30 minutes, followed by a network optimization call.
- **Wi-Fi Calling Optimization:** Enable fast roaming and validate IPsec tunnels for secure, seamless connectivity.

STRAIGHTFORWARD CONVENIENCE WITH POWER OVER ETHERNET. MEET SOLIS ENERGY'S LPT 148.



Sometimes the best location for an installation is at the top of a light pole. Our LPT 148 not only eliminates the need to run wires up and down the pole for power, but also converts grid power to Power over Ethernet. Two PoE inputs allow you to run multiple devices simultaneously without the expense and difficulty of installing either an AC outlet, a separate PoE injector, or both for each device. The LPT can be installed on any electric light fixture with a standard photocontrol light sensing receptacle and doesn't interfere with normal operation of the light fixture. Great for use with surveillance cameras, traffic monitoring devices, Wi-Fi radios, and more.

LPT 148 WITH DUAL PoE



FEATURES

- True Universal AC Input — 85-305 VAC
- 2 PoE Ports, Mode B
- Integrated Surge Protection
- Simple Twist-Lock For Error Free Installation
- No Interference With Photocontrol Operation
- Wide Operating Temperature (-20°C to 60°C)
- ANSI C136.41 7-Pin Dimming Photocontrol Connector



APPLICATIONS

- Surveillance Cameras
- Wi-Fi Hotspots
- Wireless Communication Equipment
5G, CBRS, Private LTE
- Environmental Sensors
- Smart City Devices
- Traffic Management Devices



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Rev 24.7

LPT148 POWER TAP ADAPTER

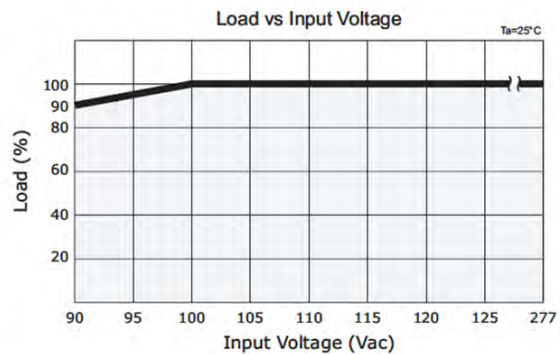
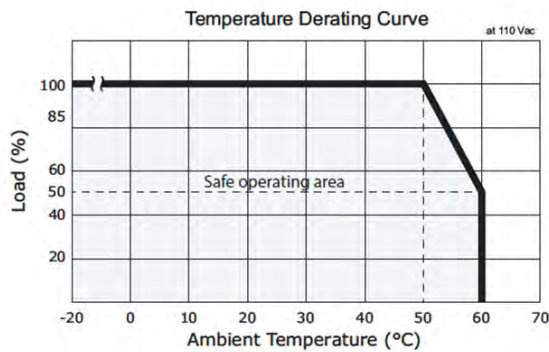
INPUT OUTPUT

- Host Connector: ANSI C136.41: 7-Pin Dimming Photocell Connector
- PoE Ports: 2 | Data Ports: 2 | Output Voltage: 48 VDC
- Data Lines: Pair 1 - Pins 1/2 | Pair 2 - Pins 3/6
- PoE Power Pinout: Pos VDC - Pins 4 / 5 | Neg VDC - Pins 7 / 8
- Maximum Output @ 50C: 70W | Maximum Output @ 60C: 35W

ENVIRONMENTAL AND PROTECTION

- Operating Temperature: -20 – 60 °C | Storage Temperature: -40 – 85 °C
- Short/Over Circuit Protection: Hiccup, Auto Recovery
- Over Voltage Protection: Clamped by TVS

Parameter	Conditions/Description	Min	Typical	Max	Units
Voltage		90		305	VAC
Frequency		47		63	Hz
Input Current	at 115 VAC, Full Load		1.5		A
	at 230 VAC, Full Load		0.7		A
Inrush Current	at 230 VAC, Cold Start		50		A
Leakage Current	at 277 VAC			3.5	mA
No Load Power Consumption	at 110 VAC			0.24	W
	at 230 VAC			0.30	W



DEPENDABLE. PRACTICAL. VERSATILE.

MEET SOLIS ENERGY'S UNINTERRUPTIBLE POWER SUPPLY UPS12090 SERIES



It pays to expect the unexpected. With the help of Solis Energy's Uninterruptible Power Supply (UPS), your grid-powered applications will have reliable battery backup power preventing an unplanned outage. In the event of a blackout, brownout or power dip, our UPS will keep your devices on short-term power until regular grid power is restored. The UPS is a fitting solution for critical applications such as security & surveillance systems, wireless networks, and industrial control systems installed in areas prone to harsh weather events, and any installation where continuous power is not only needed, but necessary.

UNINTERRUPTIBLE POWER SUPPLY



FEATURES

- Universal AC input (85 to 265 VAC)
- Operating Temperature (-20 to 60 °C)
- Hydraulic-Magnetic Breakers
- Powder Coated Aluminum Enclosure
- Clean DC Power Output
- Online Battery Connection - Zero Transfer Time
- Alarm Contacts



APPLICATIONS

- Surveillance Cameras
- Wireless Communication Equipment
5G, CBRS, Private LTE, WiFi
- Emergency Call Boxes and Mustering Stations
- Obstruction Lighting
- Access Control Devices
- SCADA Systems



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Rev 24.2



UPS12090 SERIES

		UPS12090-B		UPS12090-C		UPS12090-E
		UPS12090-B 12A1	UPS12090-B U1A1	UPS12090-C 24A1	UPS12090-C 31A1	UPS12090-E 31A2
OVERVIEW	Model Number					
	System Nominal Voltage	12 VDC				
	Type	Online Industrial UPS				
	Total Weight (lb)	21.8	36.0	71.0	86.5	161.0
	Alarms	AC OK, Low Battery				
	Maximum Load	90W				
ESTIMATED BACKUP AT LOAD WATTAGE (HOURS)	90W	1.4 h	3.3 h	8.3 h	10.3 h	20.6 h
	80W	1.6 h	3.7 h	9.3 h	11.6 h	23.2 h
	70W	1.9 h	4.2 h	10.7 h	13.3 h	26.5 h
	60W	2.2 h	5 h	12.5 h	15.5 h	31.0 h
	50W	2.6 h	5.9 h	14.9 h	18.6 h	37.2 h
	40W	3.2 h	7.4 h	18.7 h	23.2 h	46.4 h
	30W	4.3 h	9.9 h	24.9 h	31.0 h	61.9 h
	20W	6.5 h	14.9 h	37.4 h	46.4 h	92.9 h
	10W	13.0 h	29.7 h	74.7 h	92.9 h	185.8 h
INPUT	Voltage Range AC	90 - 264 VAC				
	Frequency Range	50-60 Hz				
	Efficiency (Typical)	88.00%				
	AC Current (Typical Max)	2.5A @ 115 VAC, 1.5A @ 230 VAC				
OUTPUT	DC Voltage	13.8 V				
	Load Max Current	7.6 A				
	Battery Max current	4 A				
	Total Output Power	160 W				
	Load % @ 45°C	100%				
Load % @ 70°C	50%					
PROTECTION	Input Protection Device	Hydraulic-Magnetic Circuit Breaker				
	Battery Protection Device	Hydraulic-Magnetic Circuit Breaker				
	Load Protection Device	Hydraulic-Magnetic Circuit Breaker				
	Battery Low Alarm Voltage	<11 VDC				
	Battery Cutoff Voltage	10 VDC				
ENVIRONMENTAL	Working Temperature	-20°C - 70°C (with derating)				
	Working Humidity	20% - 90% RH non-condensing				
	Storage Temperature	-20°C - 85°C				
	Storage Humidity	10-95% RH non-condensing				
ENCLOSURE	Dimensions (H x W x D) (in)	18.2 X 11.7 X 8.2		27.8 X 17.4 X 8.1		28.0 X 17.4 X 15.2
	Weight, Empty (lb)	8.0		14.0		21.0
	Weight, with Controller (lb)	13.0		19.0		26.0
	Material	AL5052-H32 Aluminum Alloy				
	Finish	Polyester Powder Coat				
	Locking Mechanism	Stainless Steel Draw Latch with Padlockable Hasp				
	Hinge	Door Length Stainless Steel Piano Hinge				
	Cable Ingress / Egress	1/2" NPT Polyamide Cord Grips				
	Environmental	NEMA 3R - Field Upgradable to NEMA 4X				
	Mounting	Pole / Wall / Truss Tower				
BATTERY ARRAY	Battery Bank (Wh)	122.4	330	830.4	1032	2064
	Array Voltage (Nominal)	12 VDC				
	Array Capacity @ C5	10.2	27.5	69.2	86	172
	Chemistry	Sealed VRLA - Absorbed Glass Mat (AGM)				
	Quantity	1	1	1	1	2
	Weight, Total (lb)	8.8	23.0	52.0	67.5	135.0
Weight, Each (lb)	8.8	23.0	52.0	67.5	67.5	

Note: The information contained herein is subject to change without notice.

POWER WHEN YOU NEED IT.

Assembly and Staging Examples from Previous Deployments



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9



Fig 10

Fig 1 – Staging Wi-Fi Aps to Pole Mounts Example

Fig 2 – Staging Power and Cabling for Pole Mounts Example

Fig 3 – NEMA Enclosures to Cambium Staging Example

Fig 4 – Waterproof Ethernet Cabling Assembly Example

Fig 5 – Digital Asset Tagging and Inventory Example

Fig 6 – Base pole staging assembly Example

Fig 7 – Staging and assembly Example

Fig 8 – Point to Multipoint and Back Haul Staging Example

Fig 9 – NEMA Enclosure Staging Example

Fig 10 – Non Penetration Roof Mast for Point to Multi-Point Back Haul Example