

RAJANT Certified Network Administrator PLUS Training Course



Course Duration: 3 Days (24 hours).

Delivery Mode: Onsite Instructor-Led

Target Audience: Wireless Field Technicians, Network Engineers, System Integrators, Telecommunications Contractors, & Radio and Microwave Deployment Teams.

Course Description:

The RCNA+ Classroom Course is delivered on an ad-hoc basis and facilitated by a RAJANT Certified KMP-I Partner Instructor. Designed as an enhanced, practical alternative to the online RCNA program, the RCNA+ Classroom format provides participants with a more hands-on learning experience.

This certification program is typically delivered over three days, beginning with one to two days of technical theory combined with guided practical exercises, followed by a dedicated day of hands-on lab work. Lab content can be adapted to specific attendee requirements, ensuring relevance to real-world applications and deployment environments.

Prerequisites

- **Mandatory:** Successful completion of the Fundamentals 2024 Online Certification prior to attending.
- **Knowledge Requirements:** A strong working knowledge of IEEE 802.3 Ethernet standards, IP networking, and VLAN configuration.
- **Equipment Requirements:** Each participant must provide their own Windows 10 or Windows 11 laptop with local administrator privileges enabled.

Learning Outcomes

Upon completion, participants will be able to:

- ✓ Understand RF & Antenna Fundamentals
- ✓ Explain radio frequency principles relevant to mesh networking.
- ✓ Identify antenna types, polarisation, and placement considerations for reliable coverage.
- ✓ Apply best practices in alignment, grounding, and interference mitigation.
- ✓ Integrate Rajant BreadCrumbs into LAN Environments
- ✓ Describe and configure APT Mode for seamless LAN/WAN integration.
- ✓ Visualise network traffic flow and VLAN segregation using interactive topology tools.
- ✓ Validate connectivity and peer adjacencies across mixed wired/wireless domains.
- ✓ Operate & Manage Networks with BC|Commander
- ✓ Use BC|Commander for discovery, monitoring, and configuration of BreadCrumbs.
- ✓ Capture snapshots to assess real-time and historical network performance.
- ✓ Generate reports and interpret health indicators for troubleshooting and optimisation.
- ✓ Configure & Optimise BreadCrumbs for Field Deployment
- ✓ Carry out initial configuration, addressing, and security setup.
- ✓ Tune wireless parameters, apply recommended settings, and optimise peer connectivity.
- ✓ Validate performance through throughput testing, link quality assessment, and ongoing monitoring.
- ✓ Apply Best Practices for Mesh Reliability & Efficiency
- ✓ Optimise VLAN, QoS, and peer management for mining and industrial OT environments.



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- ✓ Document network configuration, test results, and compliance requirements.
- ✓ Demonstrate competence through hands-on labs and assessment exercises.

Course Modules

Module 1 – RF and Antenna Basics

By the end of this module, participants will be able to:

- Explain the origins of a wireless signal, including how and why an electrical signal is converted into a radio signal and back.
- Understand the principle of oscillation in the electrical-to-radio conversion process.
- Differentiate between electric fields (E-fields) and magnetic fields, including their polarization characteristics.
- Explain how an antenna's polarization is determined and how it influences signal quality.
- Define radio frequency, its unit of measurement, and its role in wireless communication.
- Understand the concepts of frequency bands and sub-bands, and define carrier frequency.
- Describe the channel size capabilities of both the 2.4 GHz and 5 GHz frequency bands.
- Identify the units of signal measurement for electrical signals and antenna gain.
- Understand the logarithmic nature of the dB scale and its use in RF engineering.
- Recognize the general radiation patterns of the three primary antenna types.
- Explain the basic concept of antenna gain and how frequency impacts wireless link range.
- Recommend appropriate antenna types for different terrain environments.
- Understand the impact of multipath propagation and Fresnel zones on signal quality.
- Explain the importance of Fresnel zone clearance in antenna placement.
- Define noise floor and signal-to-noise ratio (SNR), and describe their impact on link performance.
- Identify the general SNR requirements for reliable connectivity.
- Recognize key measurement units related to antenna and RF cable quality.

Module 2 – LAN Integration with APT Mode

(Delivered with interactive Visio diagrams for visualization)

By the end of this module, participants will be able to:

- Explain the principles of LAN integration within a Rajant Kinetic Mesh network.
- Describe APT Mode operation and how it differs from traditional bridging and routing modes.
- Use interactive topology diagrams to visualise traffic flow, VLAN segmentation, and broadcast domain control.
- Configure BreadCrumbs® for seamless integration of wired and wireless LAN segments.
- Validate APT Mode operation using packet flow analysis and peer adjacency checks.

Module 3 – BC|Commander Overview

(Delivered with live BC|Commander demonstration and snapshot examples)

By the end of this module, participants will be able to:

- Navigate the BC|Commander interface and identify its core functions.
- Use the dashboard to discover, monitor, and manage BreadCrumb® nodes.
- Apply snapshot tools to capture both real-time and historical network states.
- Generate and interpret network health indicators, including peer counts, link quality, and bandwidth utilisation.



- Export and present network data for reporting, troubleshooting, and auditing purposes.

Module 4 – Basic BreadCrumb Configuration & Optimization

(Delivered using BC|Commander and the Settings Optimization Guide)

By the end of this module, participants will be able to:

- Perform initial BreadCrumb configuration, including IP addressing and core services.
- Configure wireless parameters, such as channel assignments, transmit power, and encryption settings.
- Apply Rajant recommended best practices for optimal mesh performance in mining and industrial deployments.
- Implement mesh optimisation techniques, including peer selection, VLAN tagging, and throughput tuning.
- Use BC|Commander to validate, refine, and optimise configurations, ensuring a stable and efficient mesh network.

Assessment & Certification

To successfully achieve the RCNA+ Certification, participants must:

- Complete all required practical labs for each module, demonstrating the ability to apply theoretical knowledge in hands-on scenarios.
- Successfully pass the practical examination, which validates competency in installation, configuration, optimisation, and troubleshooting of Rajant BreadCrumb® networks.

Upon practical completion of labs and passing the assessment, participants will be awarded the Rajant Certified Network Associate Plus (RCNA+) Certificate.

