

Celona Edge Appliances

Installation Guide



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Introduction

This document provides the necessary guidance to help you install and configure the Celona Edge Appliances – namely, the Express Node, the Enterprise Node and the Enterprise Cluster.

About the Celona Edge Appliances

The Celona Edge Appliances are based on Intel's latest x86 architecture. They run the Celona Edge software to deliver the required control and data plane services for a private mobile network. These services include the enterprise optimized LTE packet core, domain proxy functions for CBRS spectrum in the United States, centralized encryption with SIM based authentication of wireless clients connected to the Celona access points (APs), among others.

Celona Edge Appliances are available in 3 hardware form factors –

- Celona Edge Express (1 RU)
- Celona Edge Enterprise Server (1 RU)
- Celona Edge Enterprise Cluster (3 RU)

Package Contents

Verify that you have received the items below. If any item is missing or damaged, contact Celona at support@celona.io for next steps.

- Celona Edge Express (1 RU)
 - US POWER CORD 18AWG
 - Screw and tie wrap kits
- Celona Edge Enterprise Server (1 RU)
 - US POWER CORD 16AWG
 - Screw and tie wrap kits
- Pair of rack mount rail sets
 - Inner and outer rail for 1U 17.2"W chassis

Hardware Specification

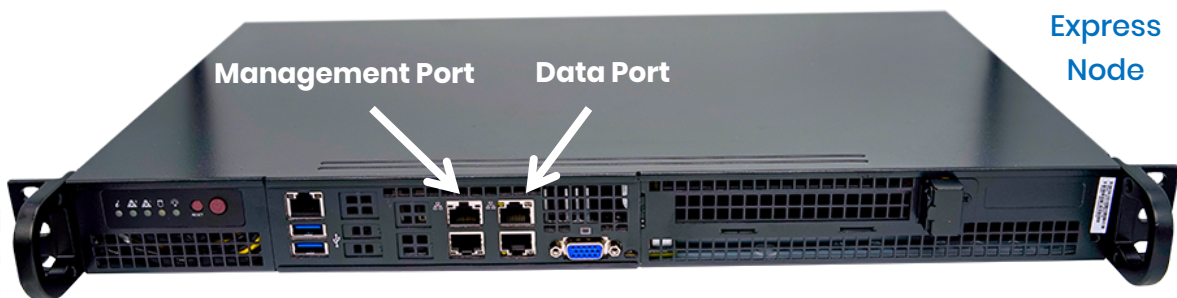


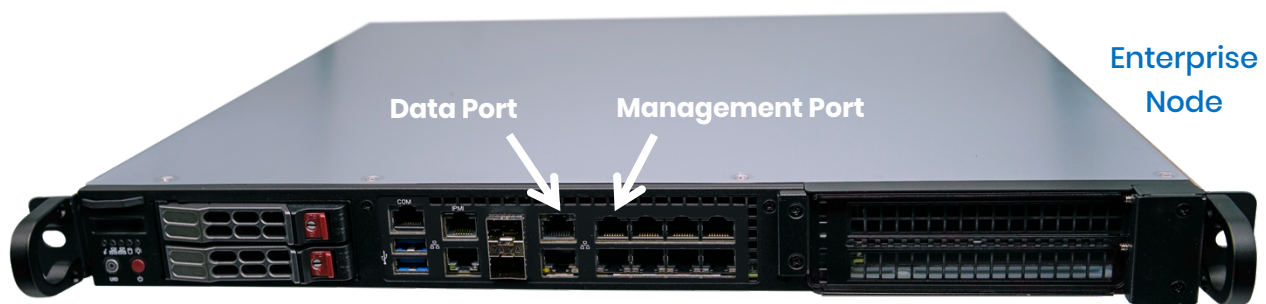
	Express Node		Enterprise Node
Network Interfaces	Two (2) 1G Base-T Two (2) 10G Base-T	Network Interfaces	Nine (9) 1G Base-T Two (2) 10G Base-T Two (2) 10G SFP+
Buttons	Power On/Off, System Reset	Buttons	Power On/Off, System Reset
LEDs	Two (2) Network Activity LEDs Fan Fail/System Overheat LED HDD Activity LED Power Status LED	LEDs	Network Activity LED Hard Drive Activity LED System Information LED Power Status LED
Power Supply (AC Power)	1U 200W Multi-output Power Supply Gold Level w/20pin	Power Supply (AC Power)	500W High-Efficiency Power Supply w/PMBus 1.2, 12C, and PFC

Powering the Appliance

The Celona Edge Appliance can be powered by connecting to a standard 110v AC power outlet.

Discovery, Provisioning & Configuration





The *data port* connects Edge appliance to the enterprise network and the Celona APs. And, the *management port* provides access to setup user interface (UI) for the appliance.

The Celona Edge Appliances support zero-touch provisioning and is pre-configured with details necessary to discover the cloud-hosted Celona Orchestrator automatically.

The Celona Edge Appliance should be located on a network segment that is reachable by the Celona APs across the enterprise network and have connectivity to the cloud-hosted Celona Orchestrator. Celona APs contact the Celona Edge as part of the setup process since Celona Edge helps with the radio management capabilities of the Celona APs and enables wireless clients to interact with the enterprise network.

In standard configuration, Data port on the Edge Appliance is configured to receive its IP via DHCP. Static IP address configuration of the data port is available via Edge setup manager as described below. Once the Celona Edge is online, it will connect to the Celona Orchestrator and will download its real-time configuration.

Edge Appliance Setup Manager

Edge Setup Manager is accessible on the Management port of the Edge appliance as a web-based UI. Plug-in a laptop to this port and use a browser to go to <http://192.168.1.10:8080> in order to access the Edge Setup Manager UI.

Default username and password to access it is *admin/Celona123*. **It is strongly recommended that this is changed after first login.**

Edge Setup Manager offers following features –

- Data port IP address allocation, static vs DHCP
- Change of hostname and the management IP address
- Limited debugging capabilities to help troubleshoot connectivity issues

Note: The Edge Appliance Setup Manager is also available on the data port IP address. Edge Setup Manager is a standalone UI implementation and has no relation to the Celona Orchestrator user interface at this time.

Static IP address configuration for the data port

Edge Setup Manager has configuration to switch between DHCP and static IP address allocation for the data port. If a static IP address is selected, user should provide the gateway IP address and the primary and secondary DNS IP addresses. Any configuration change would require a reboot of the appliance, as the UI would highlight.

The screenshot shows the 'Edge Config Manager' interface for 'Network Configuration'. A green banner at the top indicates 'Reboot Required for changes to take effect.' with a 'Reboot' button. The left sidebar lists 'Network Configuration', 'Troubleshooting', and 'Change Password'. The main content area is titled 'Network Configuration' and includes a 'Data Interface' section with the following fields: Name (test), IP Address (10.138.0.34), and IsDHCP (checked). Below these fields are 'Cancel' and 'Submit' buttons. There are also 'Hostname' and 'Management IP' sections, each with a text input field and 'Cancel'/'Submit' buttons. Annotations in pink text explain that checking 'IsDHCP' hides static IP fields and that submitting changes prompts a reboot alert.

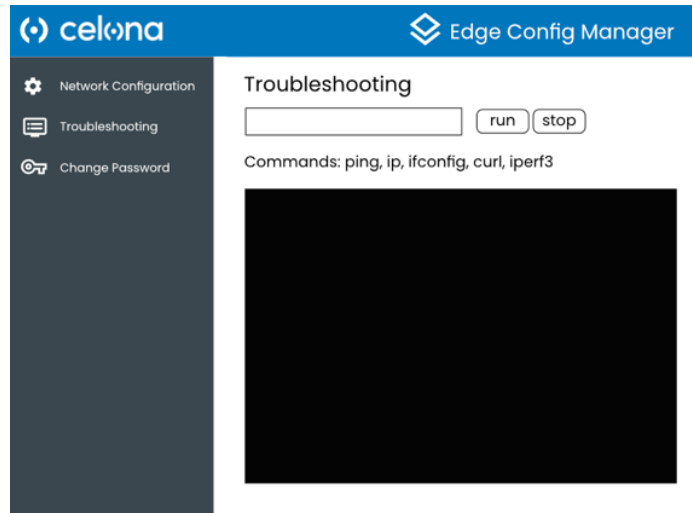
Edge Setup Manager Password Change

Default username and password to access Edge setup manage UI is *admin/Celona123*. **It is strongly recommended that this is changed after first login.**

The screenshot shows the 'Edge Config Manager' interface for 'Change Password'. The left sidebar lists 'Network Configuration', 'Troubleshooting', and 'Change Password'. The main content area is titled 'Change Password' and includes three input fields: 'Old Password', 'New Password', and 'Confirm New Password'. Below these fields is a 'Submit' button.

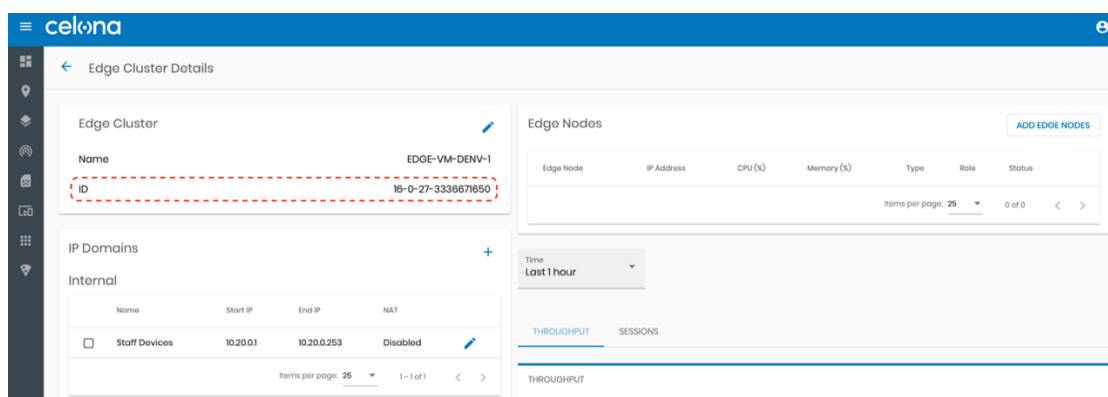
Troubleshooting

Edge Setup Manager has limited debugging capabilities with *ping*, *curl*, *iperf3* and *ifconfig* to help troubleshoot connectivity issues and test real-time network performance.



Provisioning your Celona Edge Cluster using the Celona Orchestrator

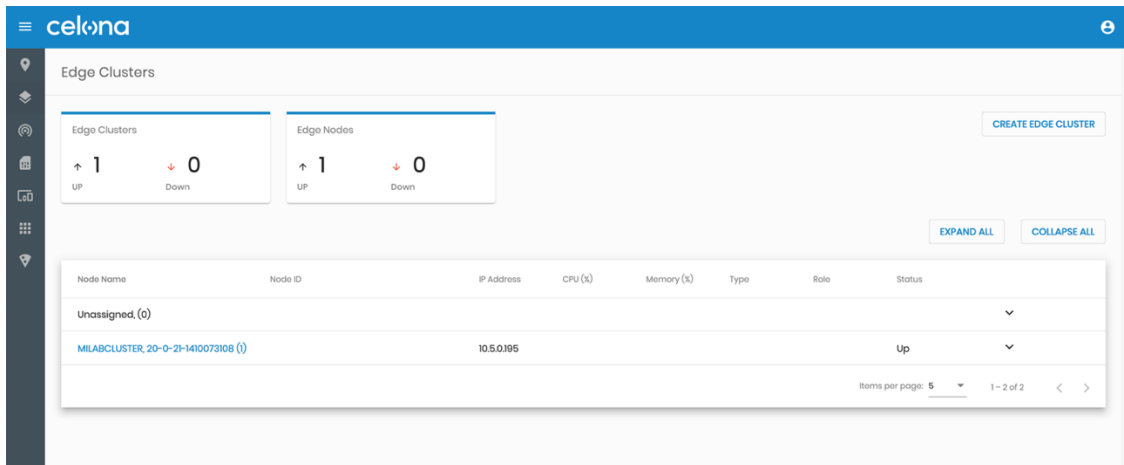
1. Log in to the Celona Orchestrator, go to the *Edge Clusters* page and click the *Create Edge Cluster* button.
2. Give the Edge Cluster a name.
 - a. We suggest creating a naming convention that will help you understand what it is and where it is information required for ongoing operations. For example, for a virtualized Edge instance, locally hosted in the Denver office, you might use *EDGE-DENV-1*. You can include additional clusters per your network design.
3. Save your *Edge Cluster Name*.



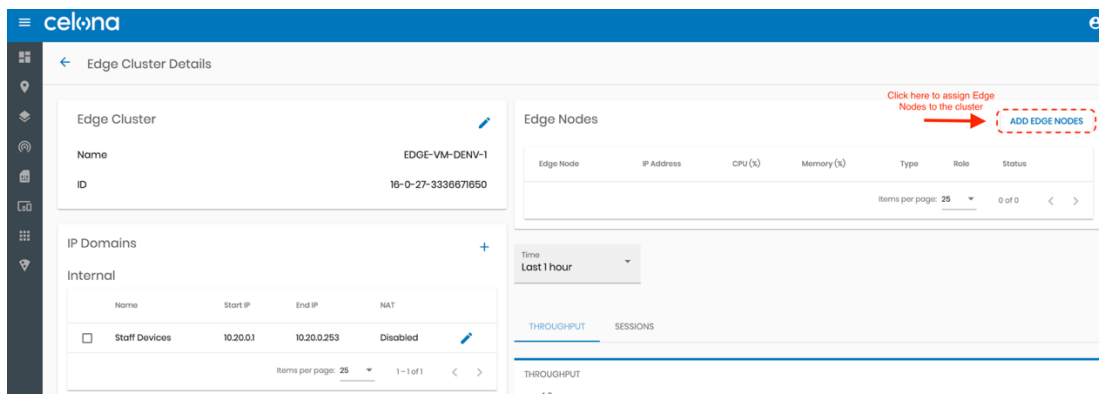
Note: It is recommended to have a minimum of one Edge Cluster for a production Celona network. Pilot networks can easily be supported via a single Edge cluster with one node.

Assign a Celona Edge Node to a Cluster using the Celona Orchestrator

1. Hover over the left-hand menu to expand, then choose *Edge Clusters*. You should now see a list of available Celona Edge instances. These will be in *Unassigned* category and show up as *New*.
2. The screenshot below shows a single cluster with one node that has been configured and connected to the network while remaining un-assigned to a specific site.



3. At this stage, you should have already deployed Edge Appliance Node on your network. If so, ensure your network policies allow communication between the Celona Orchestrator and any locally deployed Edge instances. [This article](#) provides detailed information on what ports and protocols must be allowed.
4. Click on the *Edge Cluster* and drill down into *Edge Cluster details* page.
5. Click on *Add Edge Node* button (shown below) to add Edge Node to the Cluster



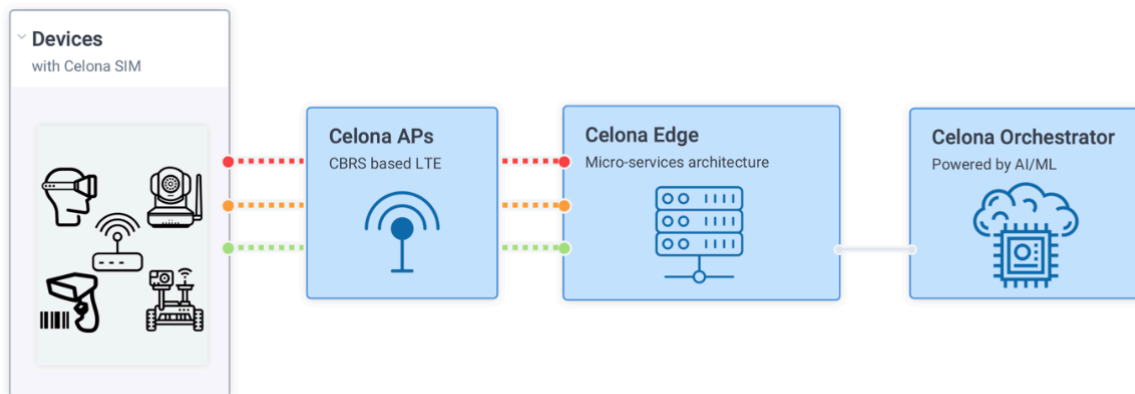
Note: In order to support VLANs within your enterprise network, Celona Edge switch interface should be a trunk port with native VLAN untagged for management and tagged VLANs for client traffic forwarding.

Additional Documentation

Please refer to our Getting Started Guide at celona.io/start for initial steps to take as you setup your own Celona mobile network.

Solution Architecture

The system consists of the essential functions detailed in the figure below. The Celona Orchestrator performs authentication, validates serial number and maintains configuration of the Edge. Celona Orchestrator also automates critical network operations – for instance, the radio frequency selection on the Celona APs with its Self-Organizing Network (SON) function, powered by machine learning.



Celona Edge acts as the data plane for the private LTE network and is managed via cloud-hosted Celona Orchestrator. It shares network telemetry data with Celona Orchestrator and enforces network access policies on a per application, device group and network segment basis. Celona Edge – drastically simplifying integration with existing enterprise IT environment – can be deployed on-premise, in the private data center or in the cloud.

With a software architecture based on microservices, the Celona Edge enables its datapath performance to elastically scale as cloud-native software, eliminating the need to manage capacity one server at a time as number of CBRS LTE access points increase in count and/or as the number of connected devices scale.

Key Benefits

- **Highly available and scalable** – As a cloud-native network OS, Celona Edge automatically clusters across multiple nodes and provides enterprise grade scalability without the operational complexity

- **High data plane performance** – By leveraging intel DPDK architecture on standard x86 server hardware
- **Deployed as overlay** – Seamlessly integrates with the existing enterprise IT network architectures
- **Plug-and-play experience** – Remote provisioned via Celona Orchestrator for installation and ongoing configuration

Physical & Environmental Specification

	Express Node		Enterprise Node
Form Factor	9.8" Mini 1U chassis	Form Factor	1U Rackmount
Dimensions (H x W x D)	1.7 x 17.2 x 9.8 (inches) 4.32 x 43.69 x 24.89 (cm)	Dimensions (H x W x D)	1.7 x 17.2 x 15 (inches) 4.32 x 43.69 x 38.1 (cm)
Gross Weight	10 lbs 4.54 kg	Gross Weight	25 lbs 11.34 kg
Operating Temperature	0° to 40° C	Operating Temperature	0° to 45° C
Storage Temperature	-40° to 70° C	Storage Temperature	-40° to 70° C
Humidity	8% to 90%	Humidity	8% to 90%

Key Performance Specifications

	Express Node	Enterprise Node	Enterprise Cluster
Recommended Deployment	Branch or Small Offices	Large Branch or Medium Campuses	Large Campus
Recommended Number of APs	Up to 40 APs	Up to 125 APs Expandable by clustering with more Enterprise Nodes	Up to 300 APs Expandable beyond 3 nodes with additional Enterprise Nodes

Operations & Maintenance

Celona Edge is operationally managed via cloud-hosted Celona Orchestrator. Celona Edge performance is monitored periodically and if a fault surfaces, the fault is automatically propagated by the Celona Edge to the Celona Orchestrator.

Security

The certificates that are required to establish HTTPS connections with the Celona Orchestrator and the IPSEC channel with the Celona APs are installed on the Celona Edge Appliance at the factory. If the certificates need to be updated or replaced, the process is automatically triggered and managed by the Celona Edge. The certificates conform to the industry compliant X.509 standard. IKEv2 is used to establish the IPSEC tunnel between the Celona Indoor AP and the Celona Edge.

Contacting Support

Celona support is available via support@celona.io.

Warranty

Celona Edge Appliances come with a 1-year limited warranty and are eligible for RMA advanced replacement, in which case the replacement hardware units will be shipped to the customer site within one business day following issuance of the RMA.

To request a return under the hardware warranty, customer must notify Celona or the Celona reseller or services partner within the hardware warranty period. To initiate a return directly to Celona, customer must send a return request to Celona at support@celona.io.