

celona

PRODUCT BRIEF

Celona Neutral Host



What is Neutral Host

A Neutral Host network is the use of a private 4G or 5G wireless infrastructure within the enterprise premises to provide certified public carrier service(s) to users with SIM cards from the public carrier's network. Neutral Host networks leverage existing private LAN, WAN, and cellular radio access network (RAN) infrastructure to propagate Mobile Network Operator (MNO) carrier signals. This Neutral Host networks provide enhanced signal strength and increased capacity in locations where public cellular signal strength is poor, and where it doesn't make sense for each MNO to deploy and manage a separately owned RAN, with the goals of increasing public cellular network coverage and capacity. Furthermore, Neutral Host networks reduce capital and operating expenses using a shared network infrastructure approach.

Traditionally several public carrier signal extension methods exist including signal boosters and Wi-Fi calling, but the most popular option is to deploy a distributed antenna system (DAS). The architectural philosophy behind DAS is that it amplifies cellular carrier signals over dedicated cabling infrastructure that is run throughout a given site.

DAS solutions are overly complex, require dedicated wiring and take months if not years to deploy.

What is Celona's Neutral Host Solution

Celona Neutral Host is a turn-key solution uniquely engineered for the enterprise to address the challenge of fast and reliable in-building public cellular coverage. Celona's cloud-first, fully integrated Neutral Host solution has been architected with cost-savings, deployment simplicity and ease-of-management in mind. Additionally, Celona multi-purpose design enables enterprises to securely use both private and multiple public networks services on the same shared infrastructure dramatically reducing capital and operating expenses.

Celona provides all the necessary network components (RAN, Core, MOCN Gateway and Orchestrator) required to enable Neutral Host leveraging the existing enterprise network infrastructures within a fully integrated, simple to deploy solution architecture. As depicted in the following graphic, Celona RAN equipment and Celona Edge OS are deployed on-site leveraging the existing enterprise IP network while the Celona Orchestrator, operating as the management and operations plane, and Celona Multi-operator Exchange (MOXN), operating as the gateway to MNO core, reside in the cloud.

4G/LTE APs



AP 12
LTE Indoor

5G NR APs



AP 20 Multi mode
Configured 5G

Celona Indoor Access Points

Enabling the highest levels of performance and range, Celona Indoor APs come with support for both private and public carrier services and are certified to broadcast T-Mobile's, AT&T's public network identifiers. Celona APs can support up to 5 public networks in addition to 1 private network.

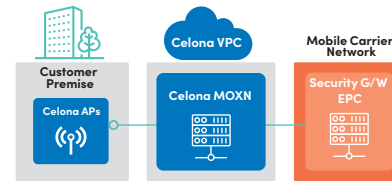
celona.io/access-points



Celona Edge OS

Fully scalable and resilient network OS that delivers converged 4G/5G core services, intelligent spectrum management and a full-function IP stack for seamless connectivity into enterprise LANs.

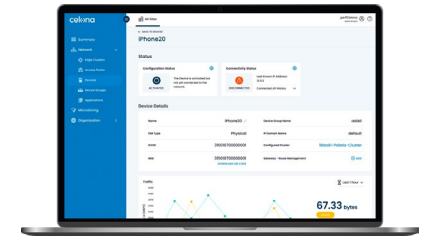
celona.io/edge-os



Celona Multi-operator Exchange (MOXN)

A cloud-based multi-operator exchange built to meet the highest levels of scalability and security requirements of Enterprises and MNOs. It establishes a secure tunnel between the Celona 5G LAN and the MNO(s) core and provides critical functions to operate Neutral Host service efficiently and securely.

celona.io/neutral-host



Celona Orchestrator

A unified cloud-based network orchestration and management platform for both Private Wireless and Neutral Host services that delivers complete visibility and control over your network, devices, and traffic flows - including zero touch installation of Celona APs, and Edge OS, and visibility into usage and performance of the Neutral Host service.

celona.io/orchestrator

FEATURES



Celona Neutral Host as a fully managed service



Complete end-to-end integrated solution



Cloud-hosted Multi-operator Exchange (MOXN)



Multi-purpose network for private and public services



Flexible pricing & deployment models



Leverage existing enterprise LAN infrastructure



High quality T-Mobile and AT&T LTE voice & data services with full mobility. e911 and Wireless Emergency Alert (WEA) for all carriers

BENEFITS

Accelerate time to value by eliminating overhead of operator engagement for site intake, bring-up and Day N performance management and reporting

Improved efficiency and ops for Enterprise and MNO

Improved scalability, reliability, and security. Eliminate the overhead of additional on-premises equipment

Justify infrastructure investment and accelerate ROI

Reduce barrier to entry by offering scalable pricing model, add-on service to private wireless or neutral host only

Better security, lower cost (40% - 60% lower TCO than DAS), fewer new elements in the network

Enhanced end-user (guest, employee) experience and CSAT, meet regulatory requirements of delivery reliable public cellular service

Delivering Unique Value to all Stakeholders

FOR SUBSCRIBERS

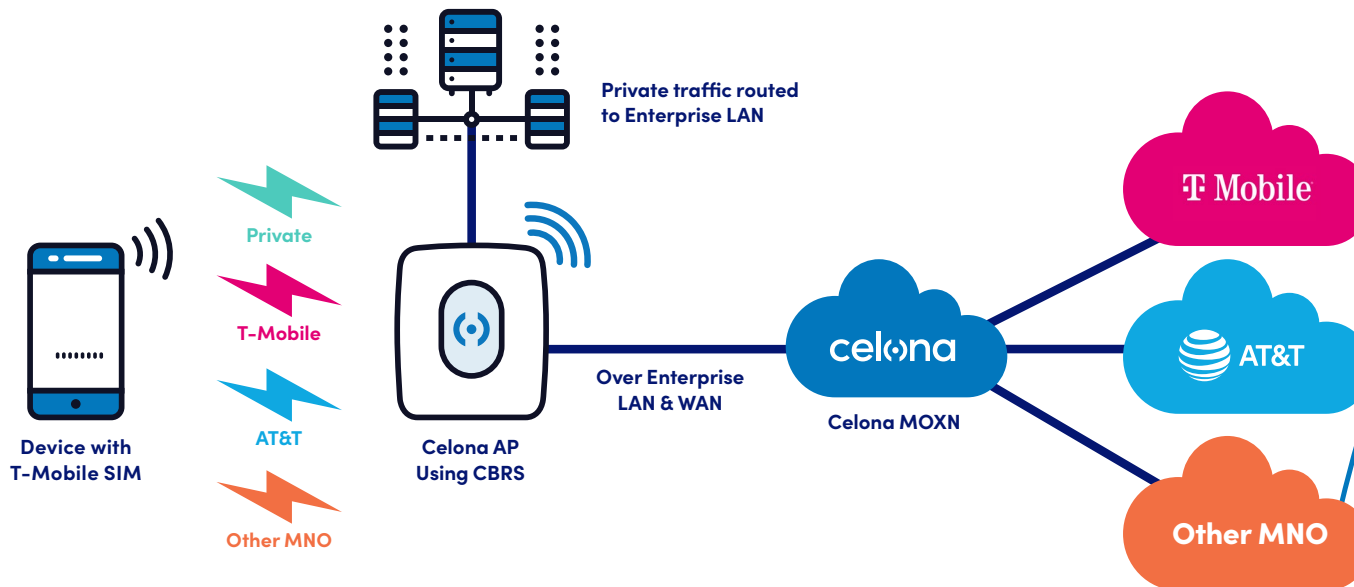
- High quality indoor cellular wireless connectivity
- Requires no manual connection step
- Secure cellular connectivity replaces un-secured open guest Wi-Fi networks
- Works with all major smartphones and tablets
- e911 and Wireless Emergency Alert (WEA)

FOR OPERATORS

- Improved subscriber experience
- Zero cost approach to adding in-building coverage
- Add Enterprise subscribers
- Non overlapping spectrum (CBRS) reduces RF engineering cost

FOR ENTERPRISES

- Coverage everywhere you need
- Deploy in weeks not years
- Use existing network infrastructure
- Add up to 5 operators in the future without additional hardware
- Frees up Wi-Fi network capacity from guest usage
- Use same CBRS network for private use cases



* PLMN ID stands for Public Land Mobile Network Identifier. It is a unique identifier for each carrier.

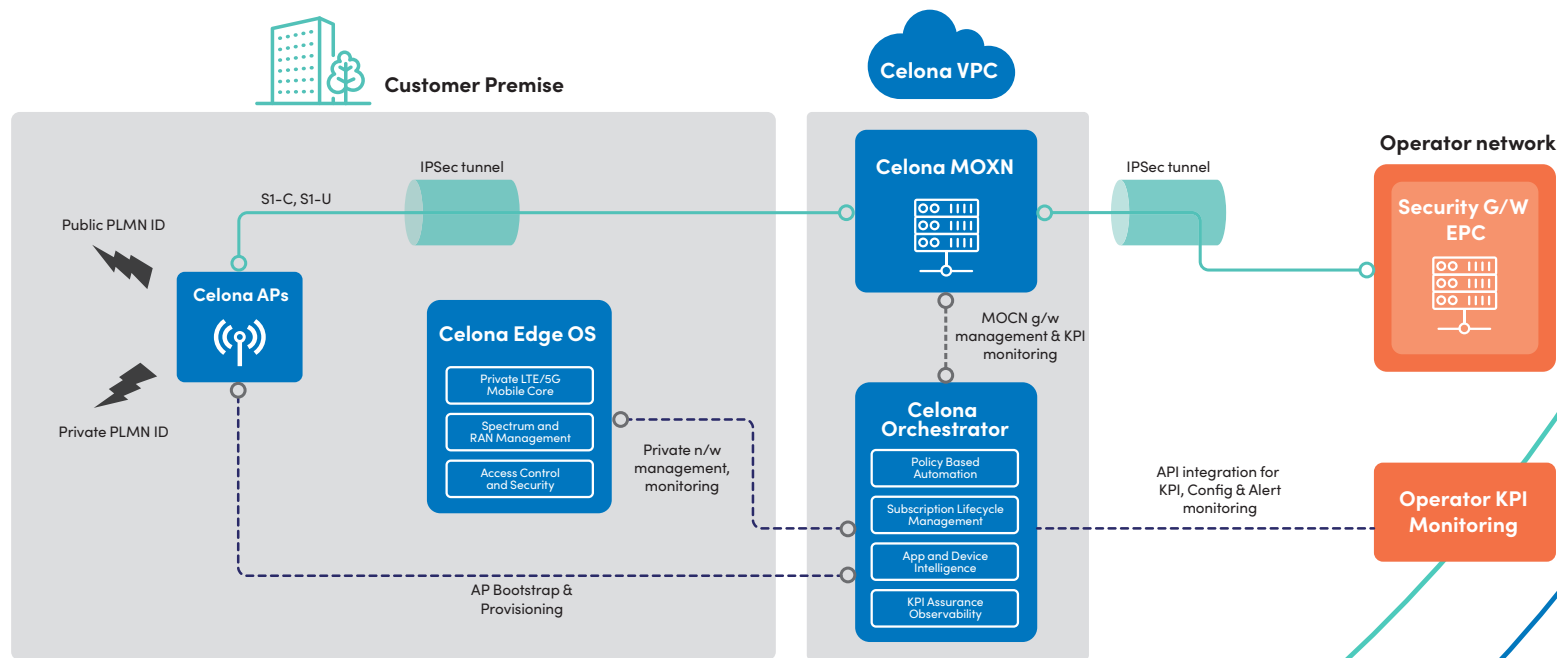
Architecture - RAN sharing with Celona Multi-operator Exchange (MOXN)

Celona MOXN is a cloud-based multi-operator software exchange built to meet the highest levels of scalability and security requirements of Enterprises and MNOs. It establishes a secure tunnel between the Celona 5G LAN and the MNO(s) core and provides critical functions to operate Celona Neutral Host service efficiently and securely.

Celona MOXN uses multi-operator core network (MOCN) architecture approach which is unique from a RAN sharing perspective. Unlike other models that require each MNO to advertise their network using licensed frequencies or separate channels, MOCN allows for multiple MNO networks and private networks to be advertised using a single private spectrum channel. This allows

for much greater deployment flexibility for multi-MNO in-building propagation in addition to private LTE/5G who can all share a single access point and antenna infrastructure.

Celona architecture addresses data security and segmentation concerns associated with the sensitive subscriber data traversing a corporate LAN by logically segregating private network traffic from public MNO traffic. The following diagram shows how separate secure tunnel is established at each Celona Access Point (AP) to transport data destined to one or more remote MNO networks. Once the MNO traffic reaches the MOCN gateway, traffic from the single MNO tunnel is segmented onto individual secure tunnels and transmitted to the MNO's core network services.



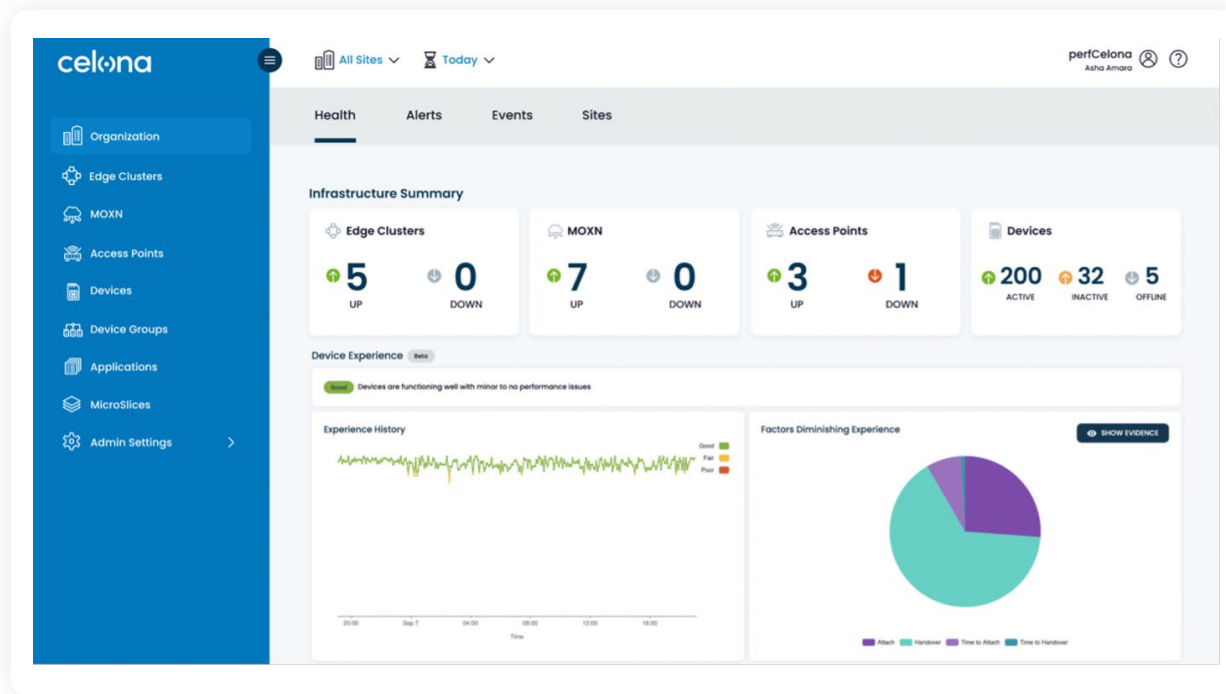
Celona MOXN offers a host of critical security services using industry best-practices

- Standards compliant, IKEv2 and IPsec tunnel configuration
- Internal IPsec tunnel termination from Celona APs
- External MNO IPsec tunnel termination from the MNO gateway
- Internal and External IPsec certificate handling
- Cloud-based HSM for managing encryption keys

Celona MOXN Key Value Prop

- First multi-site, multi-customer cloud-based software exchange offered as-a-service
- Elegant solution with enhanced customer experience – no additional hardware appliances, access to DMZ not required, operational simplicity
- Cloud-native architecture improves scalability and reliability using highly available cloud infrastructure
- Secure end-to-end connectivity between subscriber & operator network using industry best-practices
- API-first approach for programmatic consumption of Network KPIs by operators and enterprises

Day N Monitoring using Celona Orchestrator



Infrastructure Summary including MOXN

MOXN Details

MOXN: Ashton Gate - gateway | IP Address: 172.21.65.6

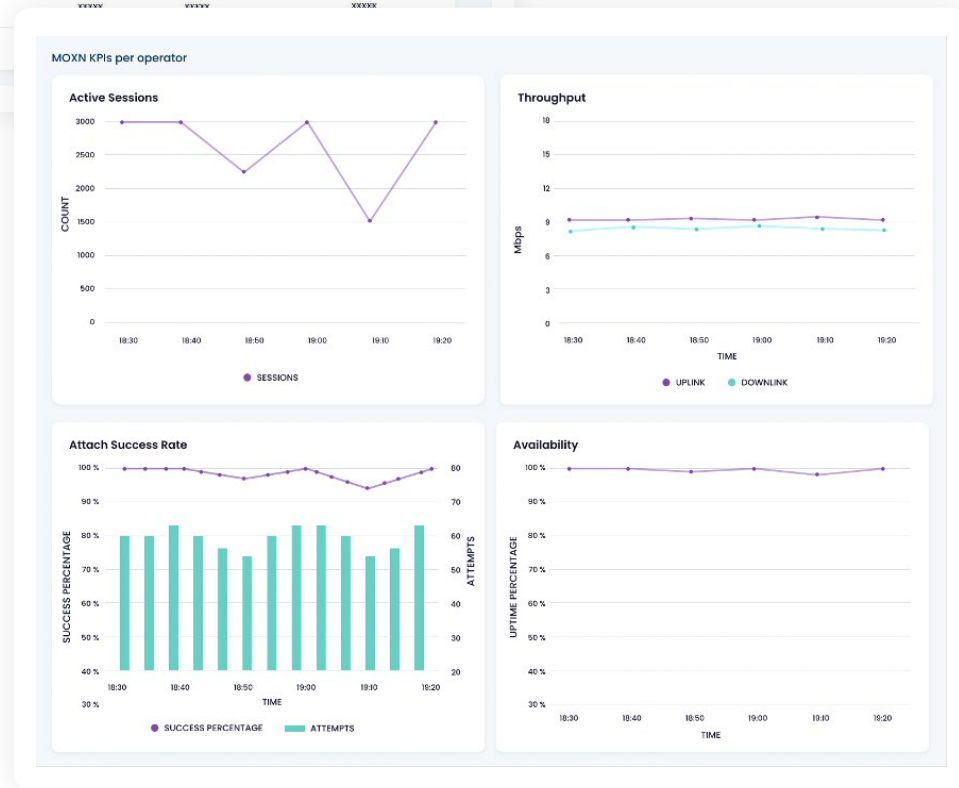
Status: Up | Version: 2306.moxn

System Uptime: 2h 10m

OPERATOR SERVICES

Operator Name	PLMN ID	Macro eNB-ID	TAC	IPSec Gateway	MME IP Address
T-Mobile	[REDACTED]	XXXXX	XXXXX	XXXXX	XXXXX
AT&T	[REDACTED]	XXXXX	XXXXX	XXXXX	XXXXX
Mobile Operator 3	[REDACTED]	XXXXX	XXXXX	XXXXX	XXXXX

MOXN details page with Operator configuration data



MOXN KPIs per operator

Access Point Config

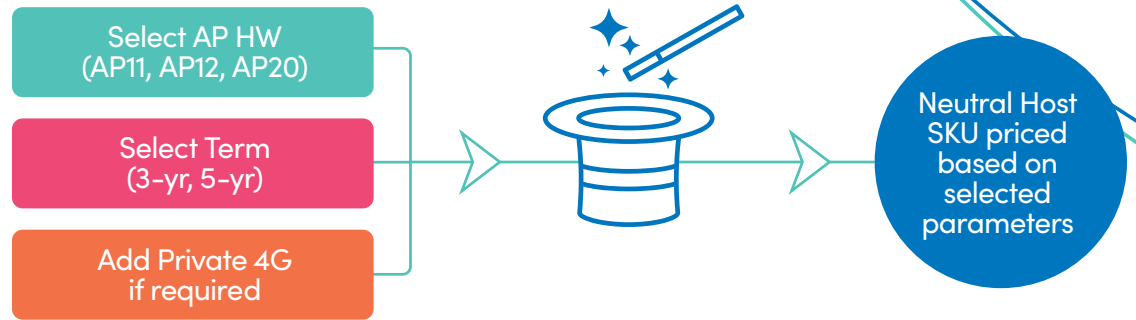
Network Service	Private 4G & Neutral Host	TDD (Time Division Duplex)	TDD Config 1															
PLMN IDs	<table border="1"> <thead> <tr> <th>PLMN ID</th> <th>PLMN Name</th> <th>Operator Name</th> </tr> </thead> <tbody> <tr> <td>315010</td> <td>CBRS</td> <td>Celona</td> </tr> <tr> <td>310018</td> <td>AT&T</td> <td>AT&T Mobility</td> </tr> <tr> <td>310004</td> <td>MNO3</td> <td>Mobile Operator 3</td> </tr> <tr> <td>310120</td> <td>T-Mobile</td> <td>T-Mobile US</td> </tr> </tbody> </table>	PLMN ID	PLMN Name	Operator Name	315010	CBRS	Celona	310018	AT&T	AT&T Mobility	310004	MNO3	Mobile Operator 3	310120	T-Mobile	T-Mobile US	Handover Parameters	
PLMN ID	PLMN Name	Operator Name																
315010	CBRS	Celona																
310018	AT&T	AT&T Mobility																
310004	MNO3	Mobile Operator 3																
310120	T-Mobile	T-Mobile US																
Frequency Band	48 (3550 - 3700 MHz)	Antenna Configuration	Complete															
TAC (Tracking Area Code)	2301																	

Celona Access Point set up for Neutral Host broadcasting multiple PLMN IDs

Pricing Strategy

Celona Neutral Host price model was developed following a customer-first approach to ensure that every use case can be priced accordingly based on required products and services. Celona offers flexible “a la carte” subscription options making ordering easy.

Additional services can be co-termed to existing subscriptions at a later point. Example: Celona Neutral Host service can be added to an existing Private 4G subscription at any time, or vice versa. The immense flexibility of the price model makes the entire ordering process seamless and stress free since new services can be included at the pace that works for the customers as their use cases evolve over time.



3 or 5 year per AP Neutral Host subscription includes

- Access Points (Celona Neutral Host currently supporting 4G indoor only configurations)
 - AP 12 Indoor 4G Access Point
 - or AP 20 Indoor 4G/5G Multimode Access Point for future proofing
- Celona Edge software
- Celona Orchestrator
- Celona MOXN for up to 3 operators
- Celona Neutral Host as a managed service, including
 - Managing the intake process and design approval with mobile operators
 - Operating the service, proactively monitoring and reporting KPIs to MNO
 - Managing network performance and experience as per MNO SLA requirements
- Support and Warranty
- Option to add-on Private 4G network subscription at any time (same hardware) at additional price



PRODUCT / SERVICE

Indoor Private 4G

Indoor Private 4G with up to 3 operators

Neutral Host 4G only service with up to 3 operators

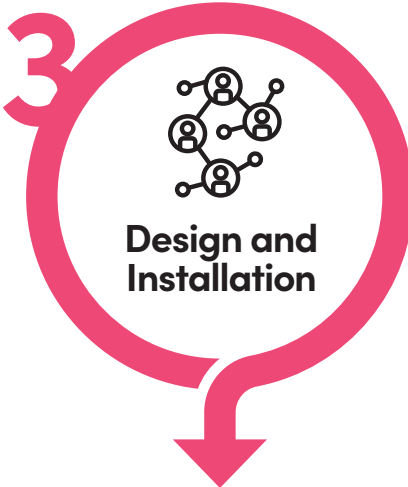
Accelerated time to value with a well-defined, simplified process



Customer and Celona or partner discuss technical and business outcomes. Celona performs high level design and provides budgetary quote



Once approved, Celona initiates intake process with MNO, customer signs One Celona Contract for all operators and issues PO to Celona



Celona or partner develop test plan, perform RF/network design, gains MNO approvals, ship equipment to customer for install, validate and transition network to customer



Customer or MSP manages network, Celona ensures neutral host performance operates per the SLA terms with MNO



Learn More about Neutral Host >



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hello@celona.io

900 E Hamilton Ave Suite 200, Campbell,
CA 95008, United States