Outline

- What is Edge AI? Why do we need it over Private Networks?

- What is XR8K Edge AI Program?

- Dell + Intel – Edge AI Program over private networks – Our Joint Value Prop

- Why Dell PowerEdge XR8K for Industrial workspaces?

- Edge AI use cases & solution example for industry verticals

- Dell + Intel – How do we accelerate Edge AI solutions GTM? Easy button for SIs
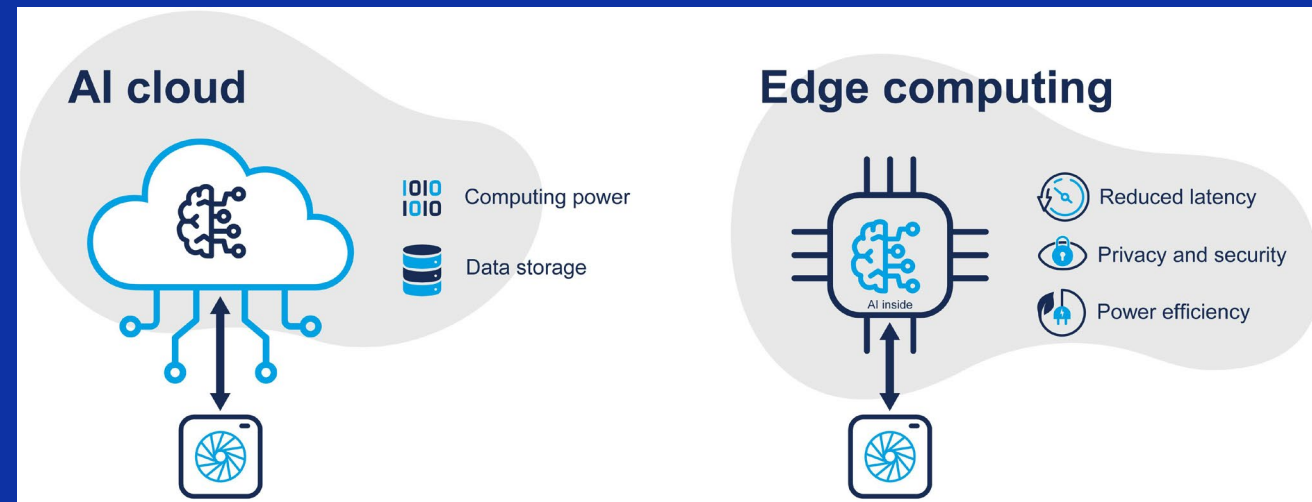
- Closing Remarks

Dell + Intel – XR8K Edge AI Program

Future Technologies – Technology Summit 2024

25 September 2024

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Why Edge AI?

AI cloud
- Computing power
- Data storage

Edge computing
- Reduced latency
- Privacy and security
- Power efficiency

Data Source	Local Processing	Edge Intelligence	Ready now ML Models	Real Time	Reduced Latency	Security	Power Efficiency
Data generated at the edge	Compute resources Closer to data source	AI at the Data source	Simplifies AI deployment	Real Time Decision & Insights	Local processing reduces latency	Improved Privacy & Data Security	Power savings
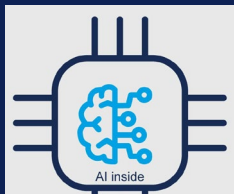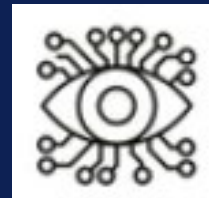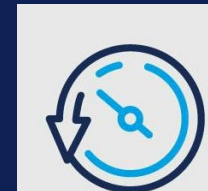
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Why Edge AI over Private Networks?

➢ Wired networks offer limited mobility

➢ Traditional Wi-Fi solutions often fall short in security, reliability, and bandwidth

➢ Private wireless networks offers
  ✓ Comprehensive coverage
  ✓ Enhanced security and reliability
  ✓ Mobility
  ✓ Efficiently manage connected devices at scale
  ✓ Lower latency application-server interactions
  ✓ High bandwidth, speed and add more devices

➢ 5G and edge computing can work together to offer enterprise IT companies
  Faster edge computing and transmission of processed data to user devices across distributed networks, which can further enhance processing speeds and deliver faster, more performant applications and experiences at scale.

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XR8K Edge AI Program

Background:

Intel and Dell Technologies are working closely with the industry ecosystem to deliver optimized and verified Edge AI applications and private wireless network connectivity on Dell PowerEdge XR8000 series servers.
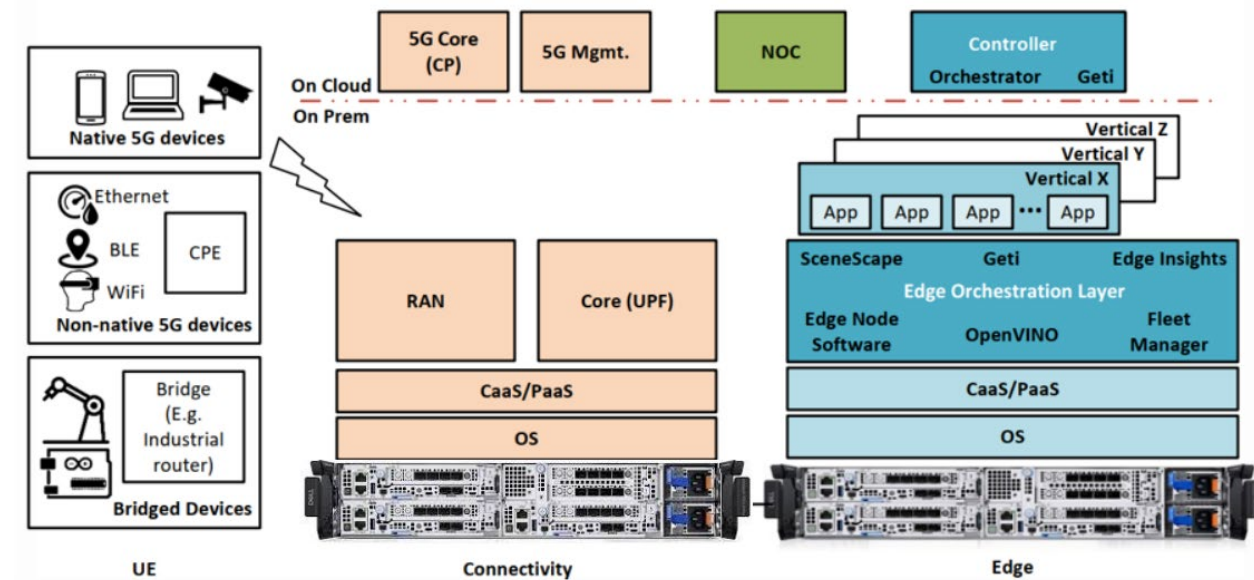
Program benefits to partners & customers:

- **Extensive Intel ISV ecosystem vertical applications, optimized with Intel AI** open-source tool kits like Open Vino.
- **E2E validation & optimization of Edge AI applications with IOT devices over Private Wireless** on Dell PowerEdge XR8000 Edge server powered by 4TH Gen Intel Xeon Processors.
- **Deliver pre-verified Dell XR8000 Edge AI vertical solution catalogs** in System Integrator labs.
- **Accelerated GTM/Biz.Dev Program for SI partners to** bring **XR8K** Edge AI vertical solutions to market and enable business outcomes to enterprise verticals.
- Dell Global Telco + LOB + Enterprise reach.
- Dell + Intel Global sales force supporting Telcos, SIs.

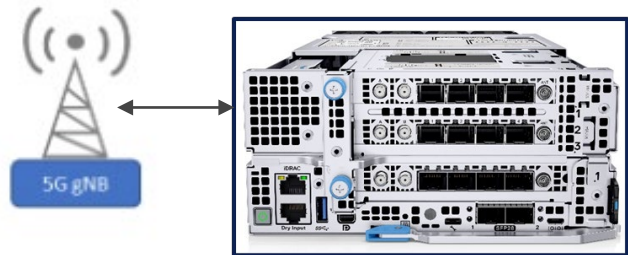**D∈LL**Technologies

XR8K Edge AI Program
Move from Connectivity to Business Outcomes

Current

**Proposed
(P5G + Edge Vertical Solution)**

E2E Integrated Cataloged Vertical Solution

Native 5G devices

Ethernet
BLE   CPE
WiFi
Non-native 5G devices

Bridge
(E.g. Industrial router)

Bridged Devices

5G gNB

Chassis

P5G Connectivity

P5G Connectivity Sled

Edge App(Multi Tenant) +
AI inferencing Sled

Business Outcomes

Telecommunications — Improve efficiency while rapidly revealing opportunities for cost optimization, service enhancement, or new technologies such as AR and VR.

Finance — Mitigate risk, identify fraud, automate processes, and reveal business optimization opportunities before your competition does.

Healthcare and Life Sciences — Accelerate research and patient outcomes with faster, more accurate analysis across precision medicine, medical imaging, lab automation, and more.

Retail — Harness your ever-growing data to gain real-time understanding of customer behavior, inventory, internal loss, and other critical metrics.

Manufacturing — Transform data into insights that help you optimize plant performance, minimize downtime, improve safety, and drive profitability.

Energy — Tap into connected operations data to balance supply and demand, enable predictive maintenance, identify issues, and discover usage trends.

Media and Entertainment — Streamline workflows and bring amazing experiences to life more easily while you reduce costs, simplify archiving, and better understand viewer preferences.

➤ Maximize Dell PowerEdge XR8K powered by Intel 4th Gen Xeon processor, based offerings to Telco LOB & Enterprises.
➤ Enable revenue generation opportunities for Telco LOB by providing value added AI services to enteprises.

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Power Up your Edge with Dell PowerEdge XR8000

Your Edge AI outcomes begin here

Run any workload anywhere

Sled-based, ruggedized server chassis holds up to four server sleds outfitted with the silicon that's best for your Edge AI workloads, delivering total **FLEXIBILITY.**

Future-proof compute platform for Edge AI workloads

Optimize operations

A chassis/sled design, paired with lifecycle management automation software, enables **SIMPLICITY** with fast and affordable upgrades and lifecycle management across your distributed Edge Environment

Efficiency | Flexibility | Simplicity

CSPs can simultaneously reduce carbon footprint and lower operation costs. We even make it easy to retire legacy systems responsibly with Dell Technologies Services

Sleds keep pace with processor development and efficiency gains

Advanced system power design enables dual PSUs to support up to four sleds

Dell Multi-Vector Cooling capabilities, with N+1 redundant fans, are integrated into the compute sled for increased chassis longevity.

Integrated fan infrastructure supports higher efficiency cooling and reduced power draw

Chassis designed to support 3 silicon generations continually reduces the cost per compute unit
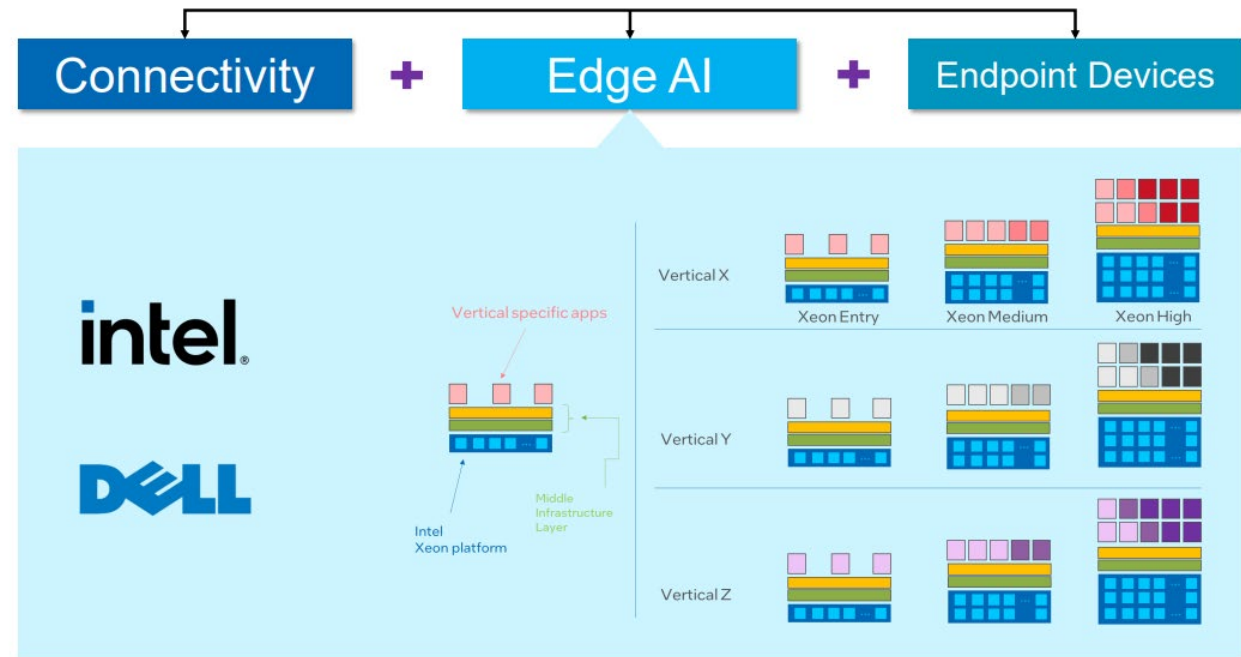
Compute, power, sleds and chassis are serviceable separately simplifying field maintenance
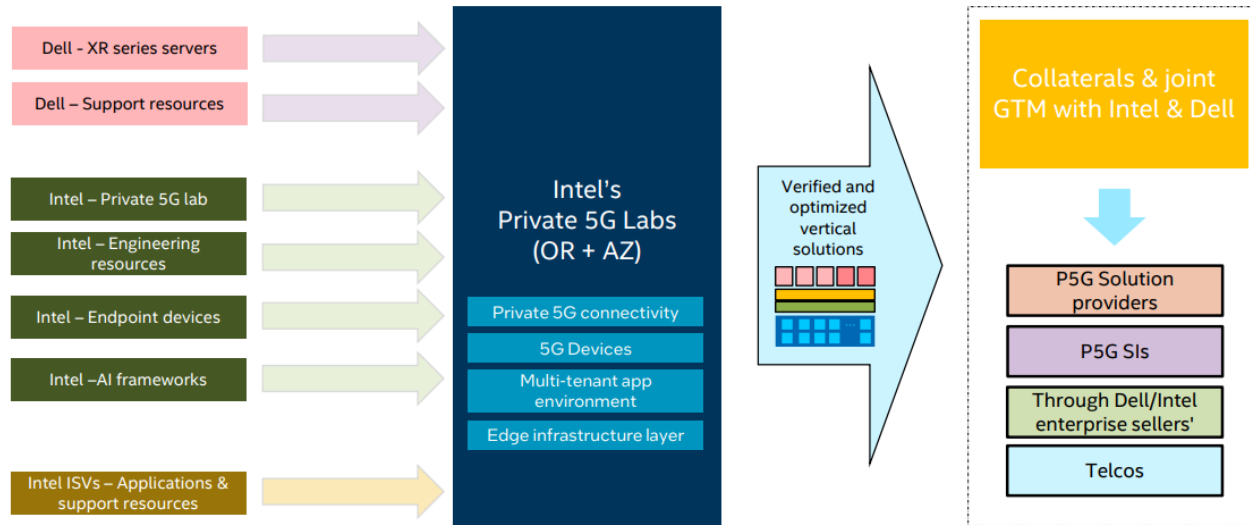
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Building vertical outcomes for Enterprises

Step:1 – Size and create XR8000 blueprints for Vertical applications and Endpoints.

Step:2 – E2E Validation & optimization of XR8000 blueprints with Edge AI over P5G to create a catalog offering

Step:3 – Deploy XR8000 Edge AI vertical catalogs in SI labs to accelerate GTM.

Connectivity + Edge AI + Endpoint Devices

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Vertical specific apps

Intel Xeon platform

Middle Infrastructure Layer

Vertical X — Xeon Entry, Xeon Medium, Xeon High
Vertical Y
Vertical Z

Dell - XR series servers
Dell – Support resources
Intel – Private 5G lab
Intel – Engineering resources
Intel – Endpoint devices
Intel –AI frameworks
Intel ISVs – Applications & support resources

Intel's Private 5G Labs (OR + AZ)
- Private 5G connectivity
- 5G Devices
- Multi-tenant app environment
- Edge infrastructure layer

Verified and optimized vertical solutions

Collaterals & joint GTM with Intel & Dell
- P5G Solution providers
- P5G SIs
- Through Dell/Intel enterprise sellers'
- Telcos

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Middle Layer Agnostic Scale Program

Engineering Enablement phase

Objective: ISV applications readiness in a multi-tenancy environment

ISV Apps onboarding with Intel Edge – Now

XR8K
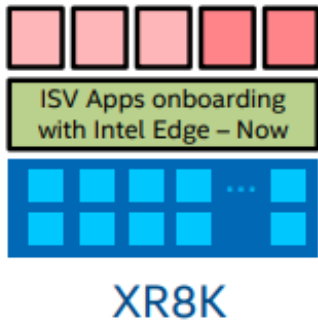
Private Preview & Scale phase

Objective: Scale Dell XR8000 series solutions

Intel ISV applications

3rd party MEC

XR8K
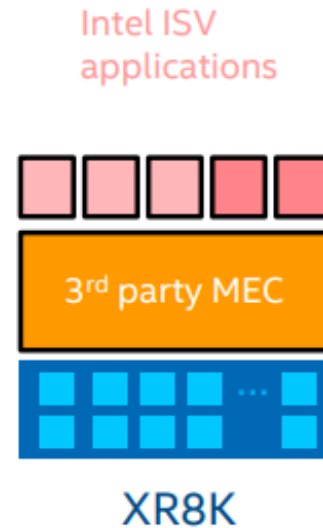
Partner/Customer asks for a specific middle layer

Flexibility and Scalability
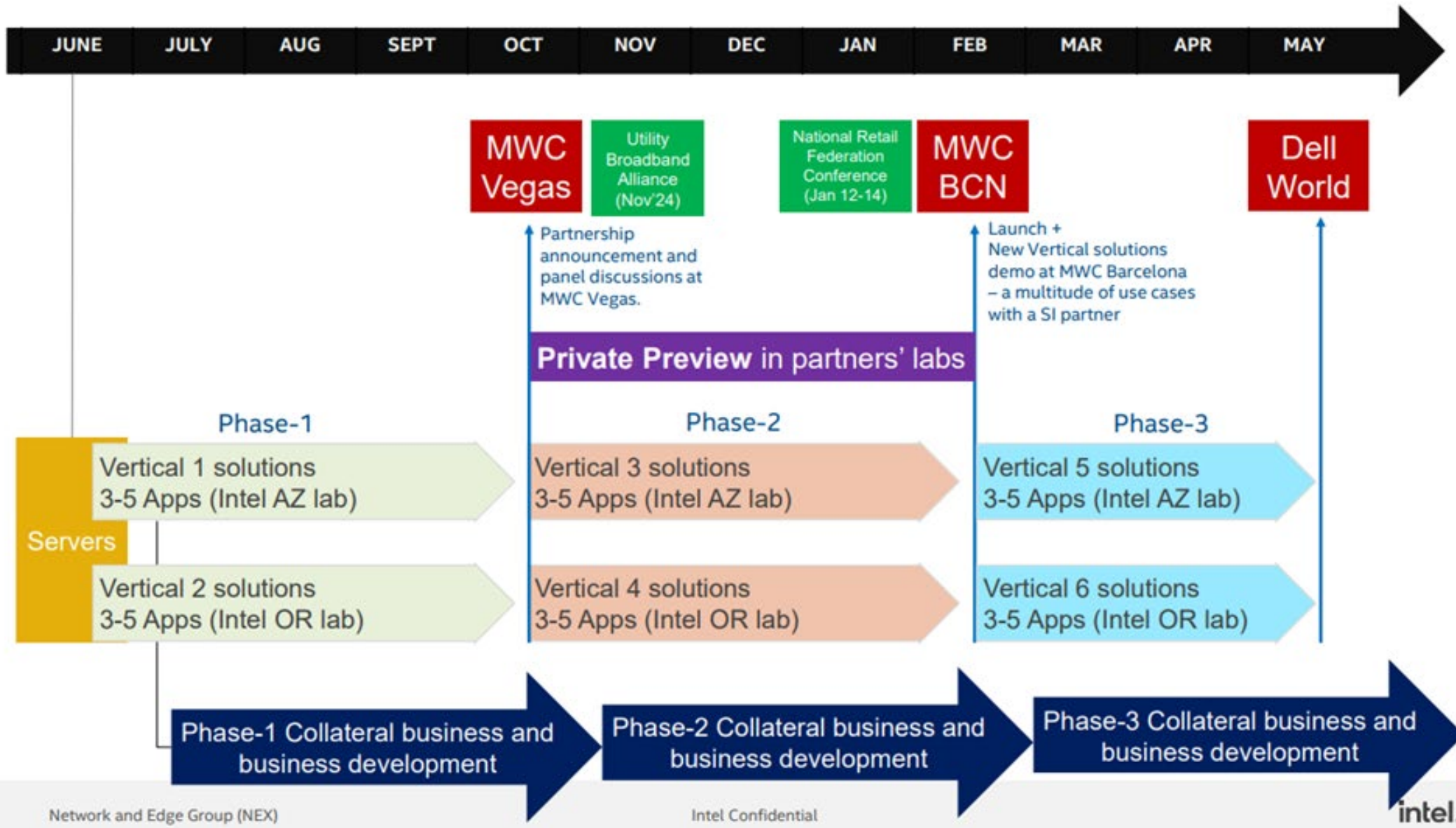
Program Timelines

Edge AI Use Case Sampler

Smart Manufacturing
- Defect detection
- Product inspection & QC
- Machine condition monitoring
- Predictive diagnostics & maintenance
- Yield analysis
- Process control & automation

Smart Retail
- POS, self checkout
- Shrinkage & loss prevention
- Digital assistants
- Planogram compliance
- Queue mgmt.
- Warehouse & automation

Smart Cities
- Traffic management
- Safety, security, surveillance
- Emergency response
- Critical infrastructure monitoring (roads, water, power, ….)
- Monitoring & enforcement (parking, garbage, ….)

Mining
- Exploration & mapping: 3D, LiDAR mapping, remote sensing
- Evaluation: RC drill rigs, drones
- Production: autonomous vehicles (haulers, drillers, LHD)
- Tele ops: Drive-by-wire

Ports
- Automated cargo load/unload
- Remote operations: cranes, tugboats, drones, …
- Autonomy: tugboats, dredging, ship inspection, AGV
- Container damage inspection
- Data showers

Energy
- Active grid management
- Substation management
- SCADA integration
- Wildfire detection
- Thermal monitoring
- Renewable source monitoring

Healthcare
- Tele-health: remote, in-hospital
- Patient monitoring
- Surgical room ops, robotics
- Medical diagnosis & triaging
- Medical imaging analytics

Scalable, multi-tenant, qualified edge AI Dell XR8K platform

Smart Venues & Hospitality
- Guest experience
- Virtual concierge
- Self check-in
- Baggage management
- Wayfinding

Agriculture
- Precision agriculture
- Disease detection
- Weather, soil monitoring
- Contamination detection
- Compliance & food quality
- Automation

Horizontal Enablers

Connected Worker & Safety
- PPE: safety & compliance
- Behavioral safety & ergonomics
- Wearables: health & tracking
- Wearable cameras
- Emergency response; evacuation
- Comms: H2H, H2M, PTT, ….
- Collaboration, remote support
- Workflow automation
- Onboarding & training
- Collision avoidance systems

Security & Surveillance
- Physical & perimeter security
- Access control & counting
- Remote surveillance
- Tailgating, intruder detection
- Fire, smoke, spill detection
- Zoning & tripwire analytics
- Sterile zones
- Gun shot detection, glass break
- Active shooter detection
- Abandoned objects

Human Analytics
- Facial recognition
- Demographic identification
- Emotion detection
- Individual/Crowd counting
- Trip line analysis, occupancy
- Heatmaps
- Motion analysis
- Queue counting/mgmt
- Suspicious behavior, loitering, vandalism

Vehicle Analytics
- LPR
- Vehicle make/model
- Vehicle counting
- Smart Parking
- Vehicle occupancy
- Speed, traffic analytics
- Fleet tracking & mgmt

Digital Infrastructure
- Digital twins
- Cyber security
- Remote operations
- Logistics & tracking
- Assets & operation optimization
- Supply chain track & trace
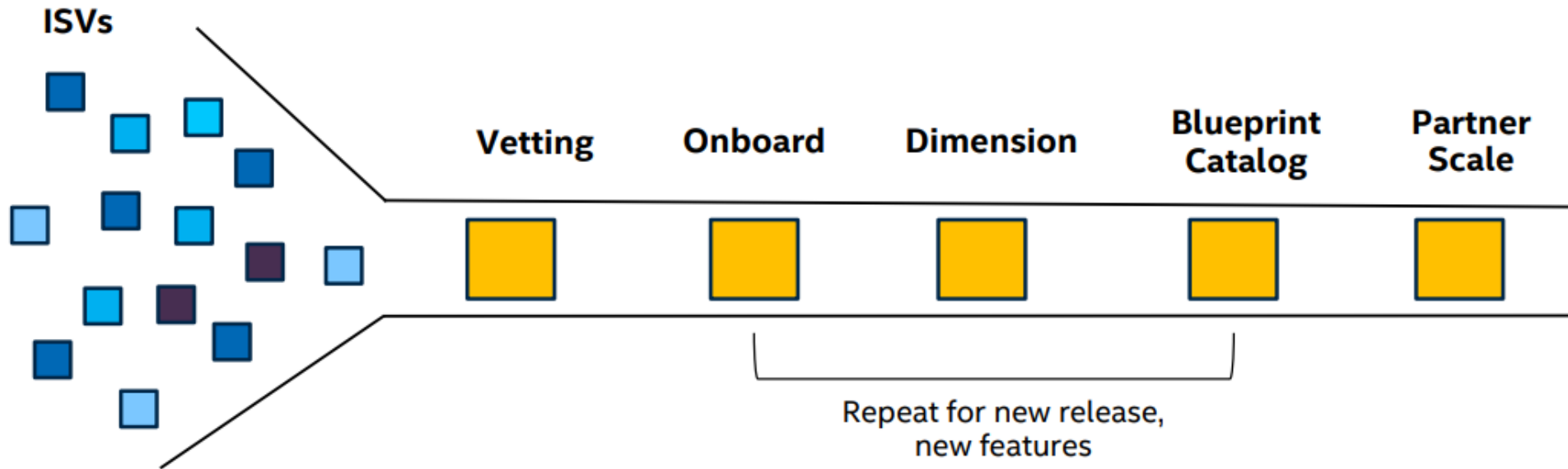- Location tracking: indoor

Sustainability
- Environmental monitoring
- Critical resource consumption & waste reduction (energy, fuel, water, …..)
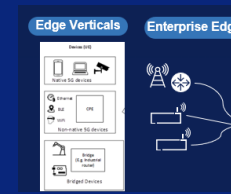- Emission reduction

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Edge AI - ISV Curation Process

ISVs

Vetting   Onboard   Dimension   Blueprint Catalog   Partner Scale

Repeat for new release, new features

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Deep Insights
AIoT Powered Site Security for safer venues and businesses

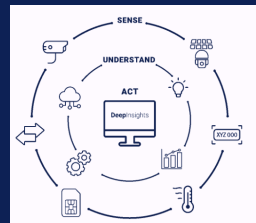## USE CASES

Edge AI Inferencing Server

5G IOT Devices (Cameras, Sensors)

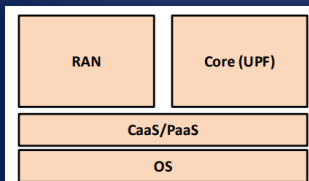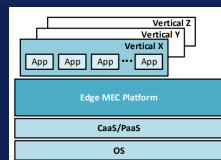**Deep Insights App Centralized management**

Dell   GSI

SERVICES

Pro-Deploy   P5G, Edge MEC, OS, CaaS, ISV Application, IOT Devices

P5G ISV SW

RAN	Core (UPF)
CaaS/PaaS	
OS	

EDGE AI ISV APPLICATION SW

Vertical Z
Vertical Y
Vertical X

| App | App | App | ••• | App |

Edge MEC Platform

CaaS/PaaS

OS

intel OpenVINO

EDGE AI INFRASTRUCTURE

Dell PowerEdge XR11

Dell PowerEdge XR8000

P5G Connectivity Server

Edge AI Application Server

With DeepInsights™, businesses and cities can now be equipped with the tools to appropriately manage its data" - Ken Mills, CEO, EPIC iO.

Edge Verticals   Enterprise Edge

Edge-To-Edge Connectivity
Connectivity to the edge sensors, whether they are IoT sensors, cameras or other devices. 19% average cost savings from SIM management.

AI Powered Edge data fusion
AI-powered learning propels unparalleled efficiency and accuracy. Data Fusion from edge sources creates a comprehensive, multi-dimensional view of environment.

Real Time Decisions
Instant response to dynamic conditions producing better outcome

Centralized Insights
Contextualized data is transmitted to a centralized platform providing a single source of truth for all to use.

STRATEGIC
Telecom Systems Business
ALLIANCES

EPIC iO   intel   DELL Technologies

Vision AI for Manufacturing
Computer Vision based incident prediction & detection to avoid prod interruptions
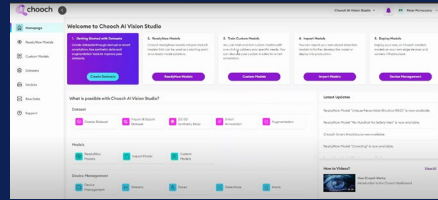
USE CASES

Edge AI Inferencing Server
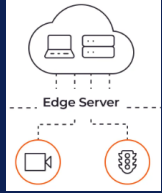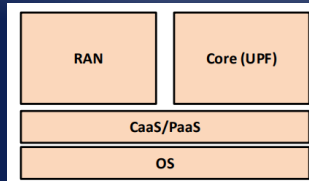
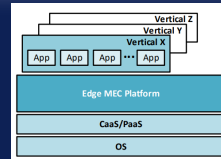**IOT Devices (Cameras,)**

AI Vision Studio

Incident Detection

Dell   GSI

SERVICES

Pro-Deploy   P5G, Edge MEC, OS, CaaS, ISV Application, IOT Devices

P5G ISV SW

RAN	Core (UPF)
CaaS/PaaS	
OS	

EDGE AI ISV APPLICATION SW

Vertical Z
Vertical Y
Vertical X
App App App ••• App
Edge MEC Platform
CaaS/PaaS
OS

intel. OpenVINO

EDGE AI INFRASTRUCTURE

Dell PowerEdge XR11

Dell PowerEdge XR8000

P5G Connectivity Server   Edge AI Application Server

Our journey with computer vision AI has mainly been around building software infrastructure, but our main innovations have been this ability to place lightweight inference engines in self-hosted and edge environments and fuse the traditional computer vision models with LLMs" Chooch's co-founder and CEO Emrah Gultekin
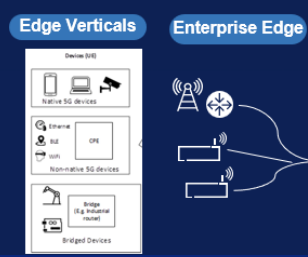
AI Vision Studio
| AI Vision Studio allows you to build computer vision solutions in minutes.

Pre-Trained Models
| ReadyNow™ AI models for object detection, image recognition makes deploying computer vision easy.

Faster & accurate processing
| Process millions of image and video data faster & more accurately at the edge or cloud faster than humans, improving productivity & efficiency

Automate device management
| Add streams, add models to your devices, and create business logic for analytics. Manage Edge devices and push your models into production without Devops.

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ALLIANCES

chooch | intel. | DELLTechnologies

Back Up

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Edge AI - ISV Curation Process

Phase-0 ISV Use cases

ISV	Solution	Usecases
Ecrio	Horizontal: worker communication (P2P), people to device comms	VoIP, Push To Talk, Push To Video, Group communication, Mission critical PTT Voice control of devices (cameras, drones)
Axxonsoft	Horizontal: audio & video surveillance and security Video mgmt; AI-based video search and analytics	LPR, motion heat map, access control, fire alarm, intruder alarm, perimeter security, queue detection, visitor counting, vehicle make & model Gun shot detection, glass breaking, siren, aggression Video search: similarity (people), event (object tracking, tripwire analytics)
Cyberlink	Horizontal: facial identification	Face for biometric recognition; emotion analytics; demographic identification Authentication & access control for facilities (factories, office buildings, events, hospitality, correction facilities, elder care); critical assets (healthcare); security (airports)
Cvedia	Horizontal: AI video analytics	**Public Security:** people counting, loitering, tailgating, intrusion detection, zone and tripwire analytics **Smart City:** vehicle occupancy, vehicle pose estimation, vehicle ingress/egress, tripwire & zone analytics **Residential Security:** Delivered package detection, unexpected package removal, mapped area monitoring
iOminiscient	Horizontal: AI based Multi-Sensory Analytics (video, sound, smell) to better replicate human reasoning	**Smart Cities** (traffic monitoring, traffic incident mgmt, adaptive traffic optimization, pedestrian safety, cubside parking mgmt, autonomous response for emergency services) **Retail:** customer analytics (dwell time, customer flow, VIP customer, store traffic, queue mgmt, outside foot traffic, know your customer); adaptive signage (gender, age group recognition); safety & security (spill detection, evacuation, rodent detection, intrusion detection, tracking known shoplifters; high-value item moniotring); parking mgmt **Hospitality:** reception mgmt (queue, VIP customer recognition, staff abuse); house keeping, safety (trays in corridor, slips & fall, smoke/fire, evacuation); parking mgmt
AI Tech	Horizontal: video analytics solutions using AI and computer vision	**Smart Transportation:** road analytics (vehicle counting, speed analytics, traffic density); anomalous & dangerous road situations (driving on wrong side of road, frequent lane changes, pedestrians/queues in forbidden zones, illegal U-turns); traffic analytics; traffic violations; LPR; rail analytics (obstales on tracks, rail crossing monitoring, tunnel and rocky area monitoring); parking mgmt **Physical surveillance:** sterile areas, tripwire detection, fire/smoke detection, spill detection, vape detection, abandoned objects **Worker safety:** PPE, helmets, vests **Retail:** single person (gender, age, emotion detections); multiple people (counting, trip line crossing, hot spots, dead area, heat map)
Chooch	Horizontal: AI vision insights for smarter, safer, efficient enterprise operations	**Geospatial analysis:** public safety (wildfire detection, accidents, citizen stranded in natual disasters); change detection (deforestation, water level changes, urban sprawl, melting glaciers, and industrial activity), safety & security (crowd analytics, loitering, suspicious objects, trespassing, **Retail:** foot traffic, stock out detection, demographic analysis, area control (access control, overcrowding, loitering), slips & falls, occupancy counting, weapon detection, behavioral analytics **Worker Safety:** PPE detection (goggles, gloves, safety vests, hard hats), vehicle control (approved travel paths, speed limits, seat belt usage), area control (restricted areas, hazardous zones, crowding, loitering), slips & falls, fire & smoke, ergonomics, weapon detection, behavioral safety (avoid line of fire injuries - people in vehicle paths, caught-in/between equipment, height violations) **Smart Cities:** critical infrastructure monitoring (power stations & water reservoirs monitoring - illegal trespassing, tampering, suspicious activity, and sabotage); preventive maintenance (early detection of corrosion, degradation of equipment, hazardous road, or airport runway conditions); emergency response (building fires, traffic accidents, roadway hazards, dangerous crowd conditions, active shooter situation, fuel spills); monitoring (parking enforcement, pothole detection, road cleaning, automated ticketing, traffic intersection mgmt, efficient garbage collection)
EpicIO	Horizontal: real-time visibility into assets, help improve safety, and drive operational efficiency	**Smart Retail:** shelf access trends, foot traffic heat map, loss prevention, queue monitoring, parking lot occupancy & safety, LPR, restricted area security, cold storage monitoring **Smart City:** Live security alerting, forensic security review, safe parks, smart parking, LPR, energy monitoring, water monitoring, environmental monitoring **Smart Utility:** Live security alerting, sensor monitoring, SCADA integration, remote surveillance, thermal AI monitoring, infrastrucutre conditions, equipment monitoring
WaitTime	Horizontal: Real Time Crowd Intelligence	Crowd counting, queue counting and management

Note: Final ISV partners subject to change

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XR8000 Server Features

Dell PowerEdge XR8000 Series

Configurability supporting up to 4 nodes with flexible I/O sled options

- 2U modular front-accessible chassis with dual power supply to support up to 4 nodes
- 2U half-width sled configurations for Edge / Far Edge, I/O or Accelerator optimized work loads
- 1U half-width sled* configuration for dense compute and network edge optimized work loads

- -48VDC options: 800W, 1100W, 1400W
- 100 to 240VAC options: 1400W, 1800W

Single socket Intel Xeon per node
- Xeon Scalable processors up 32 cores
- Xeon vRAN Boost processors up to 32 cores

Sled Flexible I/O
- Integrated 2x1/10/25GbE LOM (optional)
- Up-to three PCIe x16 FHHL card slots
- Support for 8 x Dry Input Alerts

- NEBS Level 3 / Class 1
- -20C to 55C operating temperature, up to 65C for some configurations
- Optional heater solution for less than -5C start-up and operation
- Short-depth 430 mm from front I/O wall to rear wall
- Front-accessible and simplified field serviceability

EDGE / Telecom
Target workloads

Centralized RAN
Optimized for centralized hub-sites / LDC deployments of aggregated Distributed Unit (DU) and Centralized Unit (CU) to support the transition to vRAN / Open RAN.

Distributed RAN
Extensible to cell site deployments of DU and DU/CU in certain building cabinets and cell site shelters.

Network edge
MEC and UPF use cases to support network optimization, cloud services at edge, time sensitive verticals, applications for mobile users.

Military & defense
Field ready, provides remote support for field operations and reconnaissance.

Enterprise edge
Manufacturing & Retail Applications: video monitoring and PoS analytics, IoT device aggregation, AI inferencing, OT/IT translation.

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