October 2023

Private 5G | Igniting the Industrial Revolution

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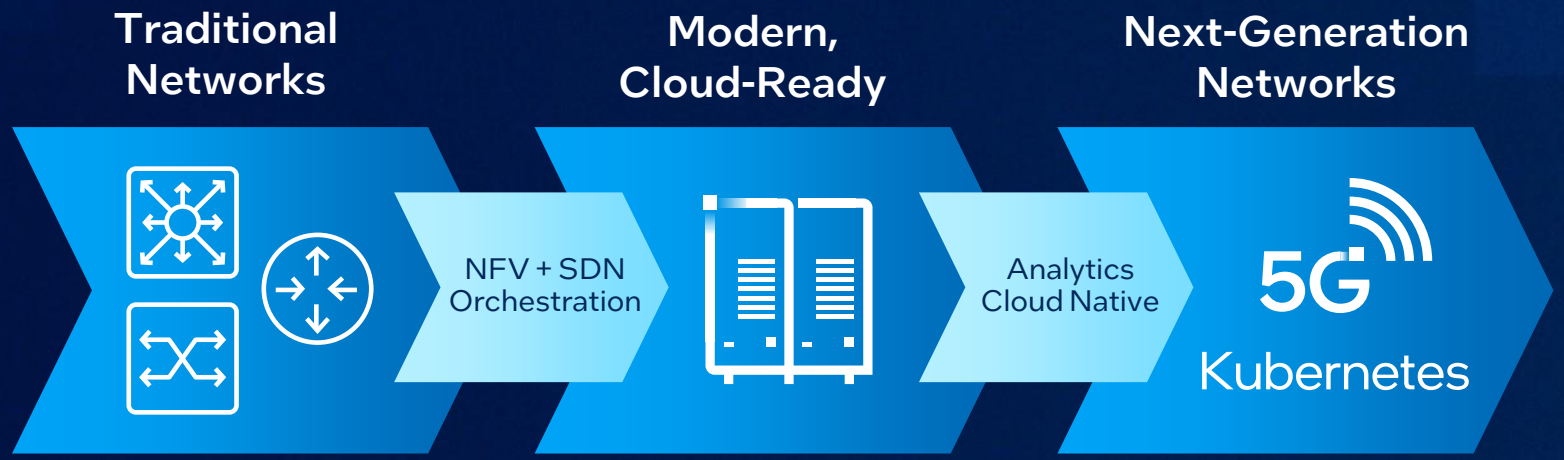
Network Transformation: Fundamental to 5G



Cloud to Edge-Native Transformation Brings

- Intelligence where it's needed
- Flexibility and agility
- Single, scalable architecture
- New use cases and services

Open Consortia & Platform SW

O-RAN ALLIANCE · ONAP (Open Network Automation Platform) · ONF Open Networking Foundation · TELECOM INFRA PROJECT · redhat · Open Source MANO · OvS Open vSwitch · AVNU · Open Visual Cloud · The Open Group · kubernetes · DPDK Data Plane Development Kit · OpenVINO · OPC Foundation

Open Frameworks Bring

- Efforts led by key CoSPs & Cloud providers
- Reference implementations that accelerate development
- Ecosystem opportunities for verticals and private 5G

Societal Shifts Will Drive Enterprises Toward an Edge-Native SW + AI Strategy

Labor Shortages and Supply Chain Bottlenecks

Digitization & Automation of Physical Infrastructure with Edge Native SW & AI

Rapid Evolution of Remote and Hybrid Work

Distributed Access, Security & Networking at the Edge For Low Latency Worker Access

Rising Privacy Concerns & Patchwork Regulations

Cost effective, Privacy Preserving Data Processing & Storage at the Edge

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Leading Industrial Use Cases

Potential Use Case		Example Application	Comms & Compute Requirement	Edge to Cloud
	Guided and Autonomous Vehicles (AGV, AMR)	Material Handling in indoor and outdoor warehouses and factory floors, Collaborating Robots	**Comms:** Mobility, Seamless handover, and Reliability **Compute:** Centralized control of AGV swarms, on-device sensor fusion, native 5G precise locationing	• ERP/Warehouse mgmt. Integration • On-prem AGV fleet management
	Visual Quality Inspection	Incoming , In-line, Outgoing inspection; ML based *Predictive* Quality Inspection to optimize production	**Comms:** High and consistent data throughput **Compute:** Real time distributed inferencing, product and process data contextualization	• ML Model training using data across global production lines
	Augmented Reality (AR)	Connected Worker, Remote equipment & facility maintenance, Worker training	**Comms:** High and consistent data throughput, Mobility, Reliability **Compute:** Rendition and augmentation at distributed edge	• Equipment Supplier remote maintenance capability
	Wireless Sensor Networks	Building automation and Remote operation command center applications	**Comms:** Reliably support massive number of end devices/sensors **Compute:** Sensor Fusion, Aggregation, distributed analytics	• Local versus facility wide operation decisions

Use Case Example: Japan Waste Treatment Site

Smart Waste Management Factory Use Cases

- Remote control/driving of tractor/backhoe in the recycling plant
- AI Camera for safety protocol adherence monitoring (safety helmet detection, human detection during operations)
- Real-time digital twin of tractor/backhoe

Private Network

- Enables real-time low latency connectivity
- Real time decision making via data collection & analysis

Edge Compute

- Ability to stream real time videos from edge node leveraging 5G connectivity with large bandwidth and low latency

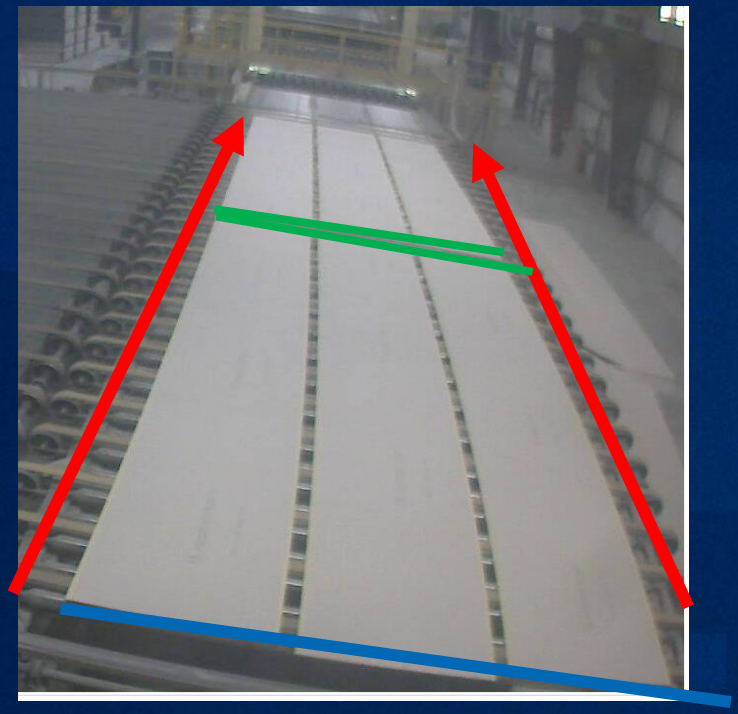
Use Case Example: Vision- Based Factory Workloads

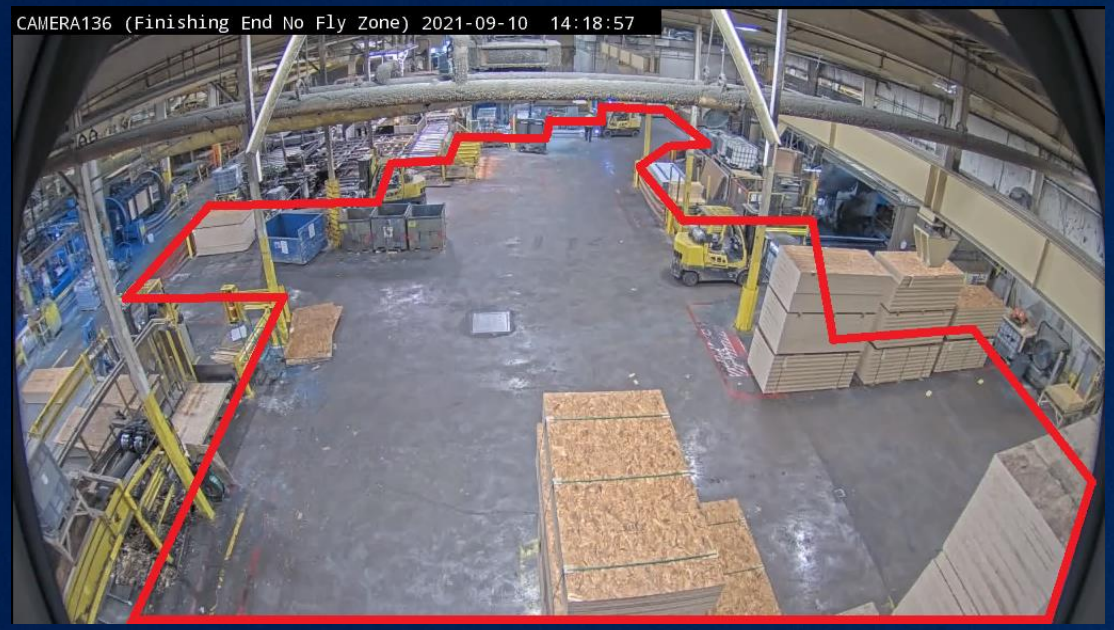
Manufacturing Workload Optimization
- AMR fleet management
- Virtual PLC consolidation
- Asset health maintenance

Use Case Priority
- Worker Safety: Keep out zoning
- Vision-based workloads
- AMR utilization, status, and real-time location

Private Network
- Seamless AMR mobility in and out of factory site

Cloud Connectivity
- Edge to cloud function





Use Case Example: Aerospace Manufacturing

Existing Workstream Improvement:

- "Instant Work Area" creation
  - Floor changes daily
- Safety: Human and machine
  - Worker safety
  - Maintenance detection
  - AGV fleet management

New Workstream Enablement

- Mobile maintenance
  - Remote vendors
- Mass data consumption
  - 1TB per hour of data
  - 8 hours using traditional connectivity
- Inventory management/tool tracking
  - Vending machines vet credentials, location, time in/out

Private Network

- 300K square feet interior space

Thank You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