

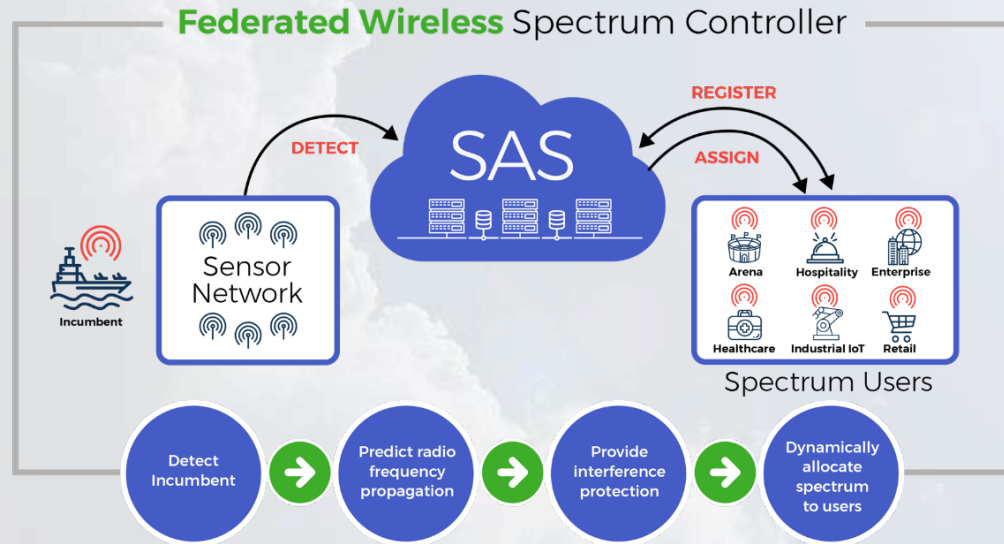
A city skyline at dusk, likely New York City, with numerous skyscrapers illuminated. The sky is a mix of blue and orange, with clouds. Several vertical white lines are drawn across the image, extending from the top to the bottom, representing connectivity or data flow. A semi-transparent white box is overlaid in the center, containing the title and speaker information.

Connectivity for Industry 4.0

Kurt Schaubach, CTO

Spectrum Sharing Changed The Game

New Wireless Connectivity for Industry 4.0



- Delivered from the Cloud
- Using ML/AI Algorithms
- Democratized Spectrum
- Enabled Private Wireless
 - Edge Compute
 - 5G/low latency
 - Local control

Consider Private Wireless When .

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- ✓ Vast physical areas have complex needs
- ✓ High risk information must be protected
- ✓ Mission critical applications must work
- ✓ Remote sites lack Infrastructure
- ✓ Separate network is required
- ✓ Budget limitations exist

	4G	5G	Wi-Fi	Wi-Fi 6E
Data Rate	Low/Medium	High	Low/Medium	High
Latency	Low/Medium	Ultra Low	Medium	Low/Medium
Scheduler	Yes	Yes	No	No
Interference	Low	Low	High	Low
Security	High	High	Low/Medium	Medium

Coverage

- Stability
- High Speed
- Mobility
- Low Latency

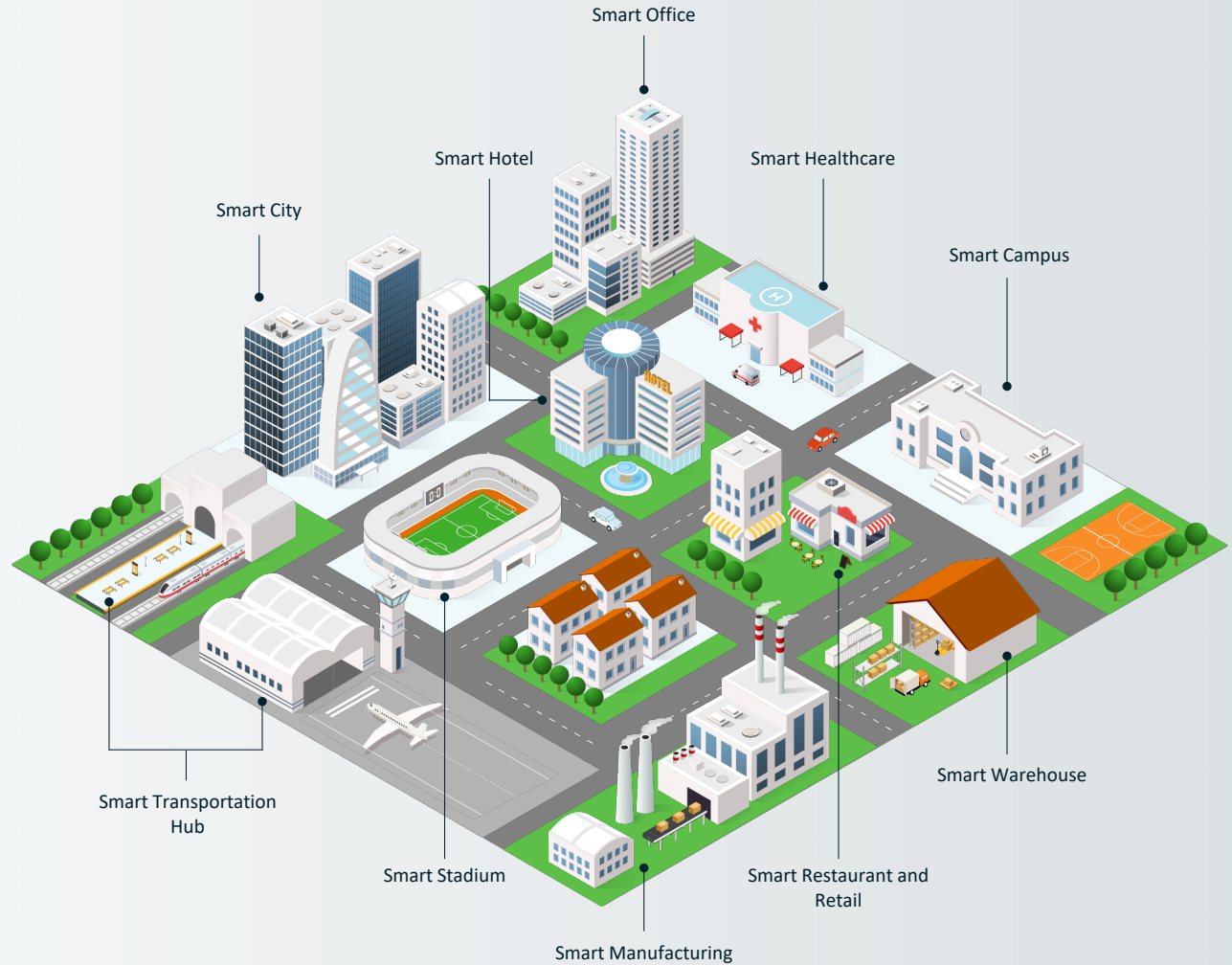
Control

- Security
- Quality of Service
- SIM Authentication
- Traffic Stays on Site

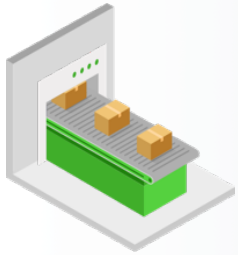
Cost

- Less Infrastructure
- Higher Range
- Less APs

The World of Private Wireless Networks



Smart Warehouse Solution

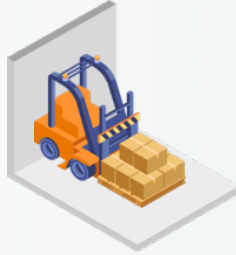


Connect Equipment

- Conveyor Belts
- Manned Forklifts
- Sensors

Value:

- Inventory/Asset Management
- Operations Heat Mapping
- Predictive Maintenance

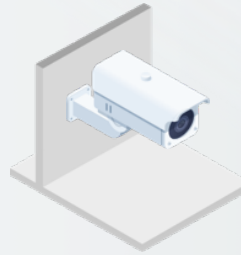


Real-time Robotics

- AGVs
- AMRs
- Autonomous Forklifts

Value:

- Optimize Routes
- Predictive Maintenance
- Warehouse Analytics



Respectful Security

- CCTV & Cameras
- Access Mgmt
- Security/Fire Alarms

Value:

- Asset Tracking
- Staff Authentication
- Arrival/Departure Tracking

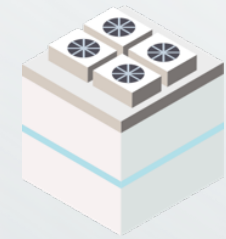


Employee Comms

- Scanners
- Ruggedized Devices
- AR glasses

Value:

- OCR & Barcode Scanning
- Push-To-Talk
- AR for Hands Free Instructions



Building Operations

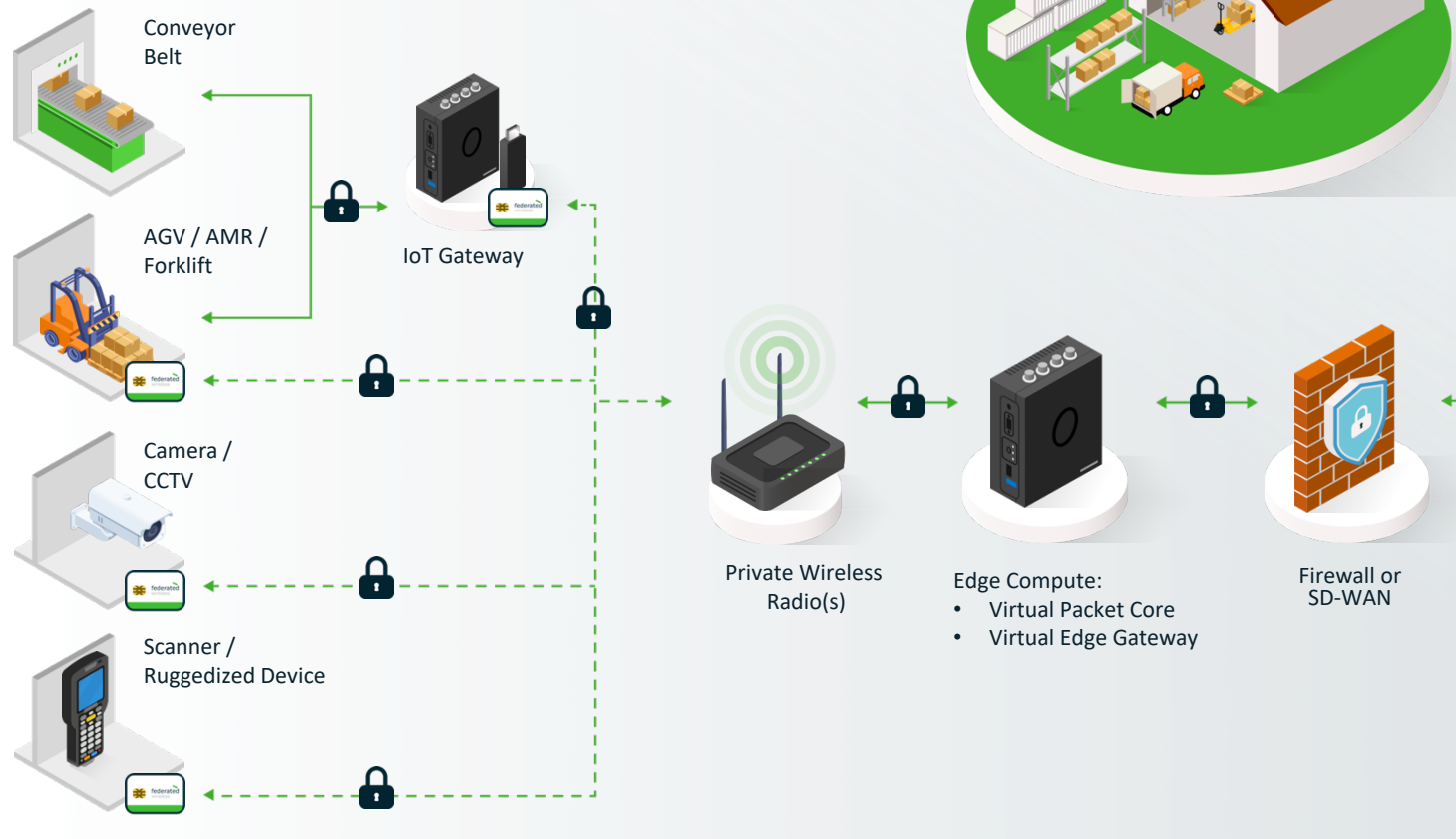
- Building Mgmt System
- HVAC & Lighting
- Utilities

Value:

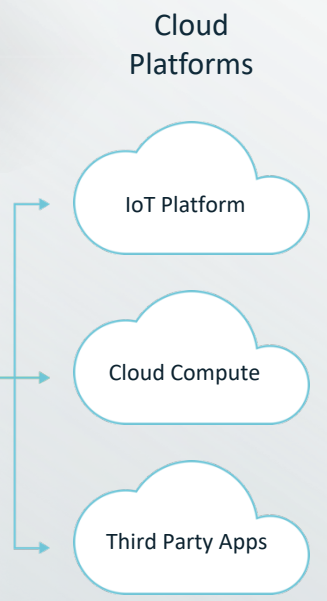
- Optimal Energy Mgmt
- Reduce Utility Costs
- Predictive Maintenance

Smart Warehouse Solution

On Premise



Cloud



Private Wireless Delivers Security, High Bandwidth, Low Latency

Smart Warehouse for Manufacturing

- Sophisticated automation technology at car manufacturing warehouse fell short due to unreliable Wi-Fi
 - Barcode scanners out of range
 - Automatically Guided Vehicles (AGVs) stop and stall
 - Operator solution too expensive
- Private Wireless POC showed reliable, high speed coverage throughout whse
- Retrofitting AGVs with Private Wireless modems for flawless performance



Coverage where needed, with secure and dependable quality

5G Smart Warehouse

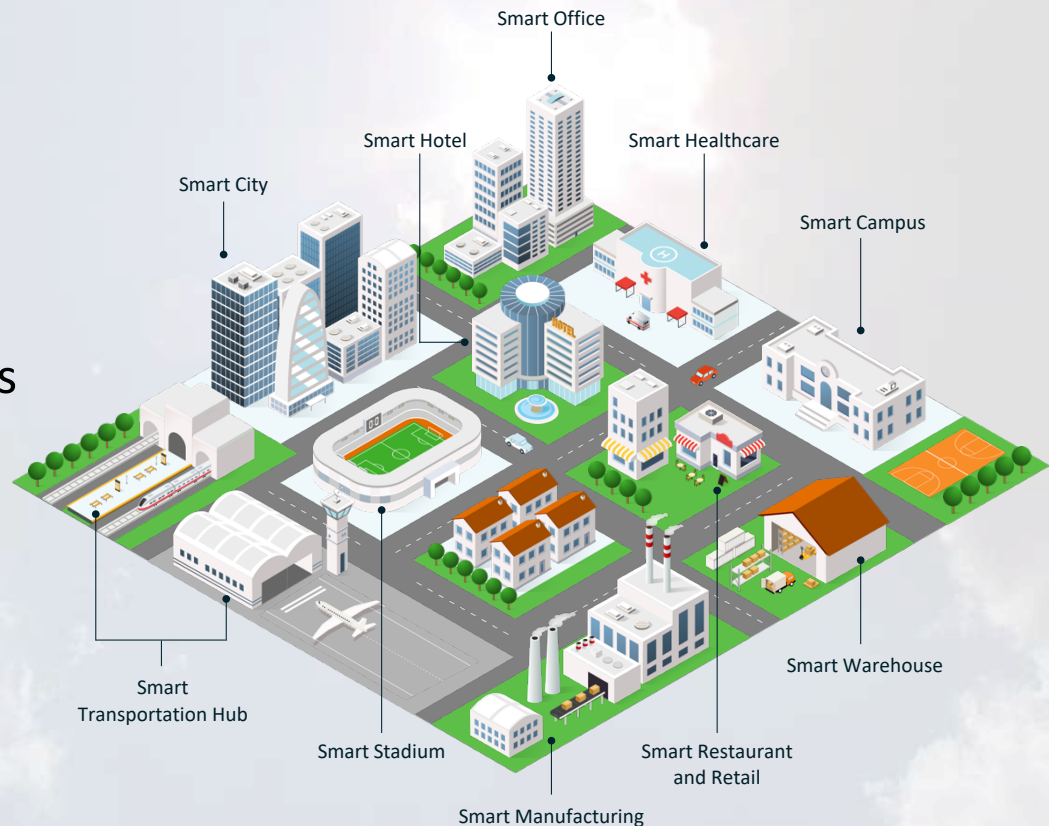
- Marine Corps Logistics Base sought IoT warehouse automation
- Goal: Improve efficiency of supply receipt, storage, issuance, inventory control, and auditability
- Federated Wireless and partners won RFP for Private 5G network with CBRS & O-RAN
- Will become DoD 5G smart warehouse reference design



Secure Private Wireless Network for Mission-Critical Logistics

Key Takeaways

- Dynamically shared spectrum provides new opportunity
- Strong demand from enterprises across vertical markets
- Enterprises want security and control without complexity
- IoT is a clear market driver



Thank You

