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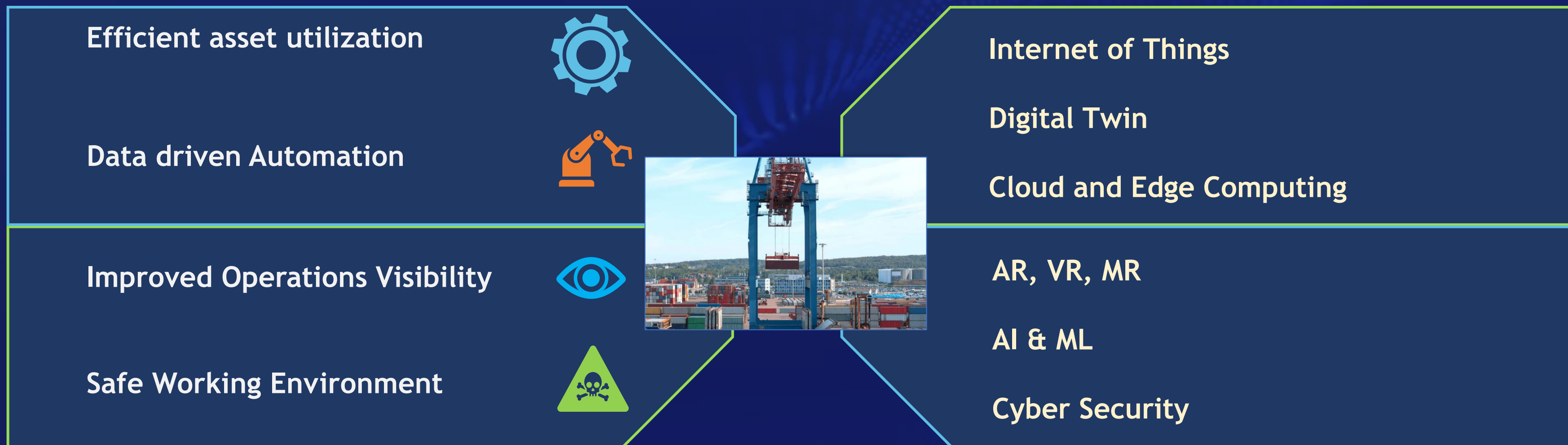
**INNOVATION IN ENTERPRISES AND INDUSTRIES
RISE OF CAPTIVE AND NON-CAPTIVE 4G/5G NETWORKS**

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Agenda

- Enterprise transformation & innovation requirements
- Need for dedicated networks
- Options of captive and non-captive 4G/5G networks
- Key points about non-captive private networks
- Ways to implement captive networks

Transformation Across Industries



NETWORK REQUIREMENTS TO ACHIEVE DIGITAL TRANSFORMATION

-  High bandwidth
-  High device density
-  All round security
-  Low latency
-  Reliable connectivity
-  Seamless mobility

Need For A Dedicated Network

Industry Challenges

Real-time data collection and analytics for Industry 4.0 challenged due to unreliable network & IT/OT integration issues

Enterprise data security is under threat from cyber attacks from internet on network and devices

Wired network offers rigid shopfloor connections and restricts industrial applications requiring mobility and on-demand expansion



Dedicated Network

- Dedicated network for enterprise campuses to connect end devices to industrial applications
- Based on an advanced technology to ensure secure and robust network
- High bandwidth and low latency network to ensure enterprise operations can be tracked via real-time data streaming
- Only enterprise authorized devices within campus can be connected to the dedicated network
- Ensures integration and interaction between the IT and OT Networks



Benefits



Highly reliable network with high throughput and low latency to enable Industry 4.0 use cases



Dedicated network with full control to enterprises to customize SLAs as per their requirements



Dedicated network to ensure devices and confidential data are protected from external threats



Dedicated connectivity to enable flexible operations and industrial applications requiring mobility

Captive And Non-captive Networks

Options to setup networks for enterprises

- Wired LAN has been used for a long time; while there is predictability, it lacks flexibility
- Other options include Wi-Fi, LoRa, BLE etc. Each provides good connectivity for a specific set of use-cases, but at the same time has certain limitations for others

Cellular data is turning out to be a good choice for enterprise networks, particularly for IT/OT integration

- High data throughput and ease of implementation / management
- Can cover all the use-cases and device requirements in the enterprise
- Device and network infrastructure ecosystem is not as mature as LAN or Wi-Fi
- Leverage an existing mobile network in the campus, or setup a new mobile network for the enterprise use

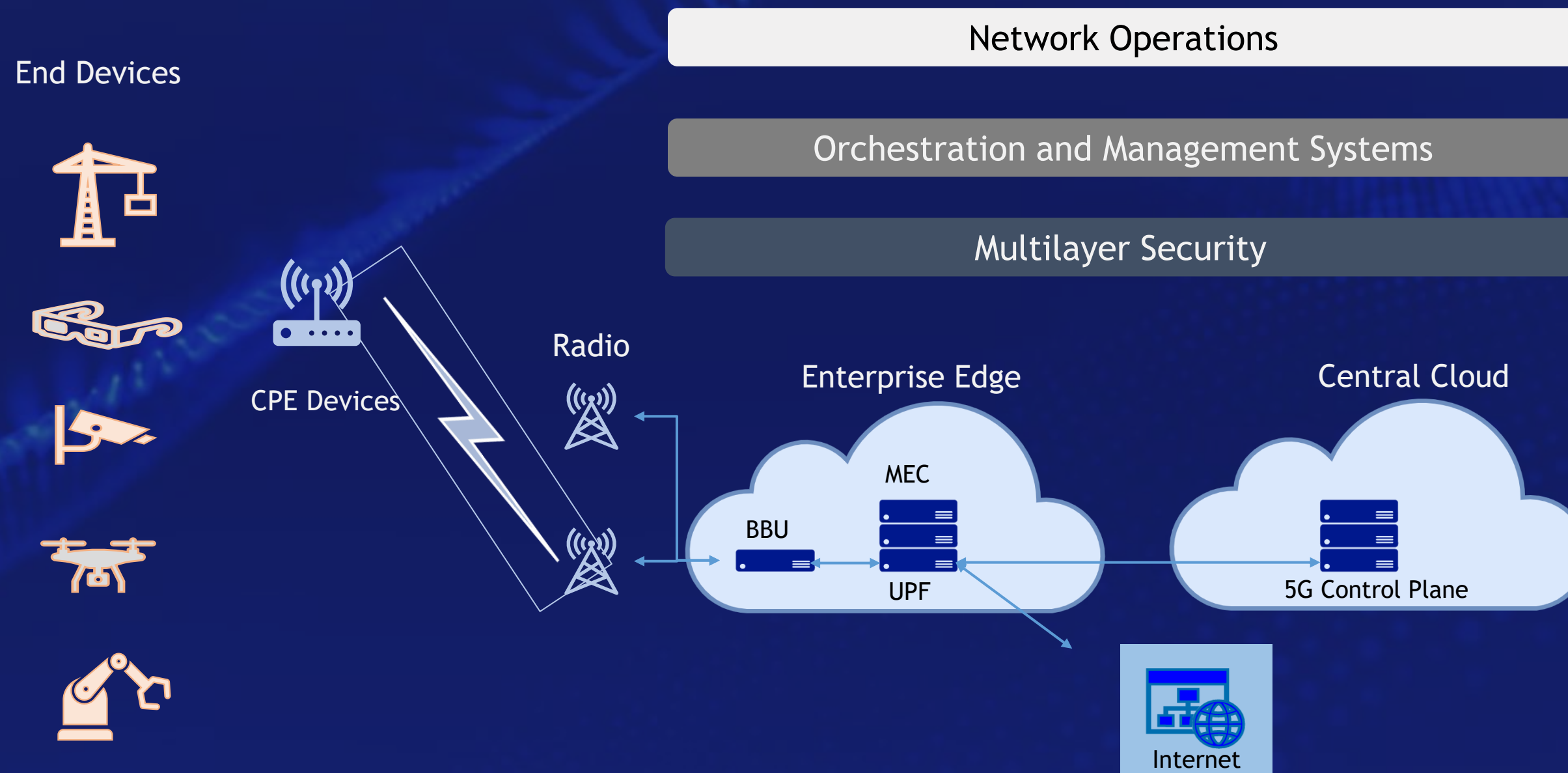
Key Points About Non-Captive Network

- Consumer mobility vs. Enterprise requirements
- Availability of uncontended spectrum / bandwidth
- Uplink / downlink profile
- Security of the data and the network itself
- Availability of enterprise applications in provider Edge
- Latency and other QoS commitments

Implementing A Captive Network

- A dedicated network for the enterprise
- RAN for the enterprise access alone
- Local breakout for low latency
- Optional Edge compute platform
- Restricted access to devices, SIM based security
- Implemented, managed and operated by the Enterprise or 3rd party
- Use of dedicated / shared spectrum
- Applications and end-devices as per Enterprise requirements

Captive 4G/5G Network Deployment



Case in Point - Manufacturing Setup





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