



SYNERGY FOR ENERGY

SEPTEMBER 26, 2024

ACUVATE DIGITAL PARTNER MEETING

boldyn
NETWORKS



AGENDA

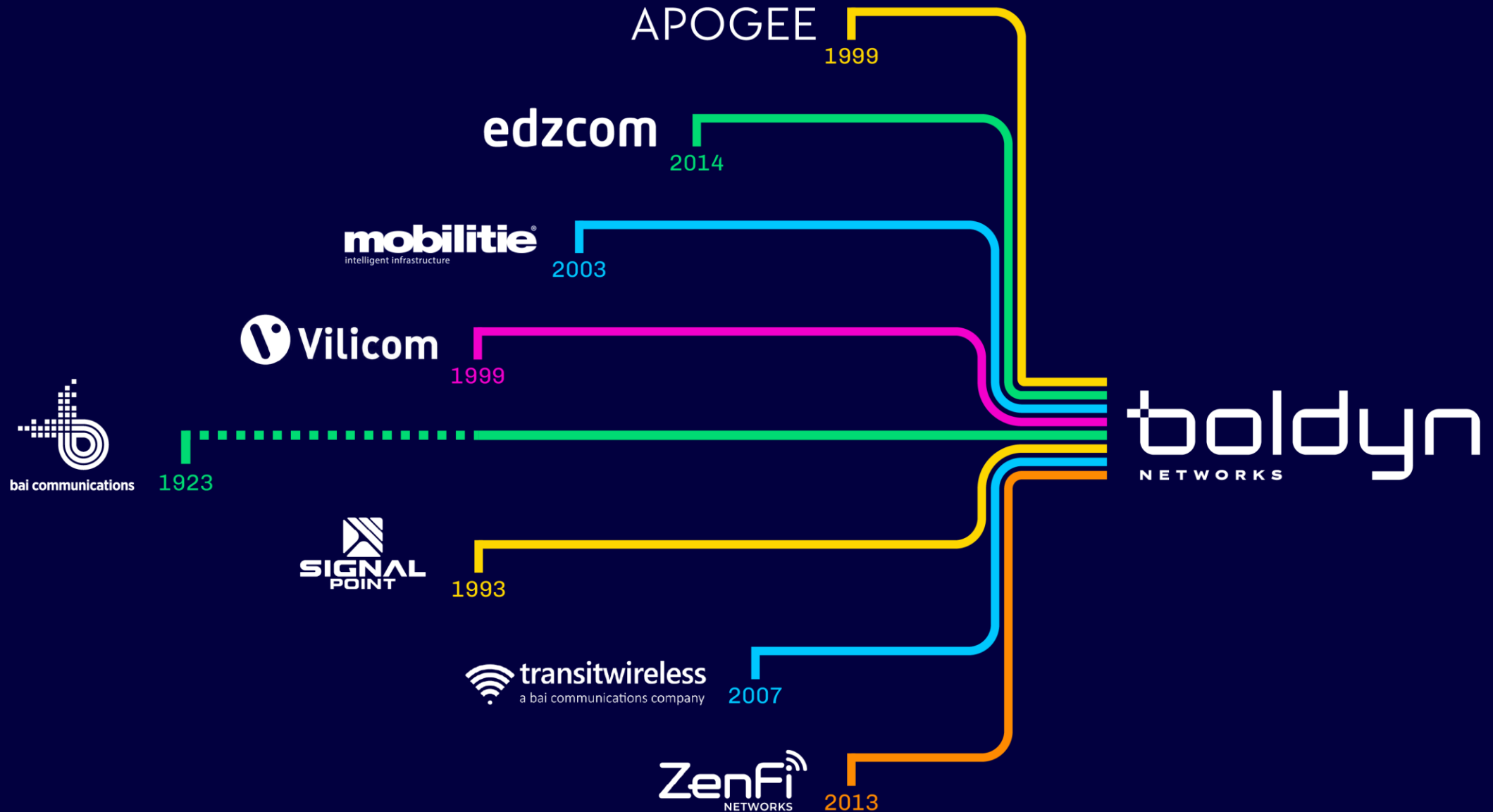


- 1 About Boldyn Networks
- 2 5G and Private Networks
- 3 Sample use cases in Energy sector
- 4 Open Discussion

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ABOUT BOLDYN

OUR BRAND HISTORY



UNLOCKING THE POWER OF AN INTERCONNECTED FUTURE

Boldyn Networks is one of the largest neutral host providers in the world. Our shared network infrastructures and cutting-edge connectivity solutions are the building blocks for an interconnected future – for everyone.

30+ years in communications in North America and Europe

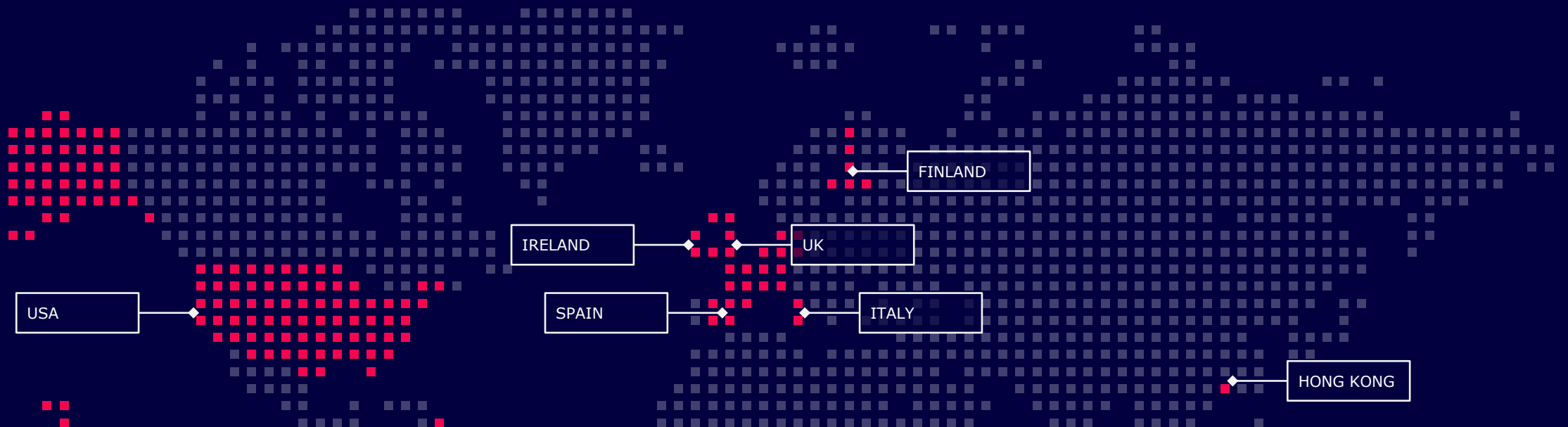
Presence in **3 continents**

Over **1,100+** employees globally and access to **+2,000 partner staff**

Networks **connecting 6 billion rides** every year in **5 major transport networks**

5 major city networks connecting fibre, thousands of venues, transport and more.

Majority-owned by Canada Pension Plan Investment Board since 2009. A trusted long-term investor with C\$632 billion net assets.



WHO WE WORK WITH



Network operators

Partnerships with **all major** mobile, fixed and virtual network operators



T Mobile



verizon



dish



Venue and Property Owners

Hundreds of venues connected across enterprise, sports, entertainment and more



Audi Field



Transit Authorities

Citywide networks with **5 major** transit systems

1000 transit stations connected



Cities, Government and Military

Multidecade agreements with cities like **London, New York, Rome** and **Sunderland**

80+ US Military bases connected

GREATER LONDON AUTHORITY

BAY AREA HOST COMMITTEE

LinkNYC

ROMA

Sunderland City Council

AMERICA'S NAVY



U.S. ARMY



Healthcare and Education

350+ higher education campuses. Connecting more than **1 million** students and staff.

Delivered the **first private 5G network** at an operating European hospital.



Manufacturing, Utilities and Logistics

55+ private networks for enterprise locations including the **world's largest** wind farm

MORAY EAST OFFSHORE WINDFARM

Orsted BOLIDEN

KONECRANES



BASF We create chemistry

PORTS AMERICA CHESAPEAKE



HELSINKI AIRPORT FINAVIA – for smooth travelling



OUR 24X7 NETWORK OPERATIONS CENTERS



Centralized 24/7 network monitoring, maintenance, and management

NOC to NOC Interface with all major carriers

Las Vegas & NYC locations



Supports multiple technologies, network and customers utilizing ITIL best practices

Tools integration with customers



Proactive network monitoring, incident, change, problem and communication management

Framework based on best people, standard processes and industry best practice tools to provide operational excellence



UNITED STATES



Investment into Las Vegas & NYC NOC locations provides geo-redundancy, load sharing, & extended coverage

Committed to be the best-in-class network operations through focus on people, processes, and tools

splunk>

twilio

xmatters

WESTELL

cacti

ableau

CISCO

servicenow

aruba
a Hewlett Packard
Enterprise company

Nagios®



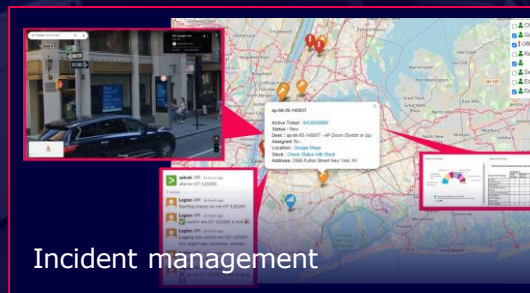
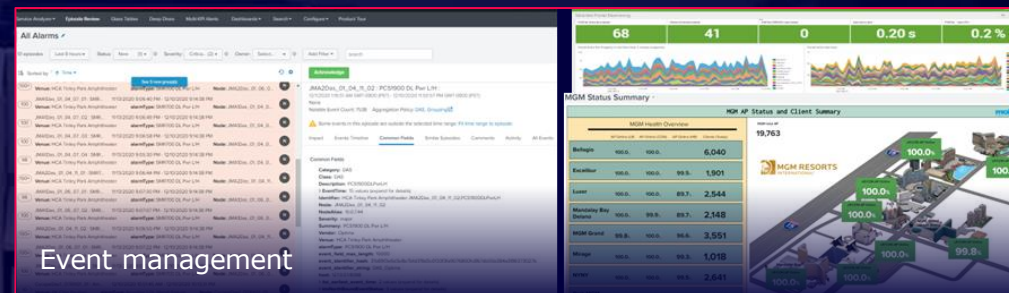
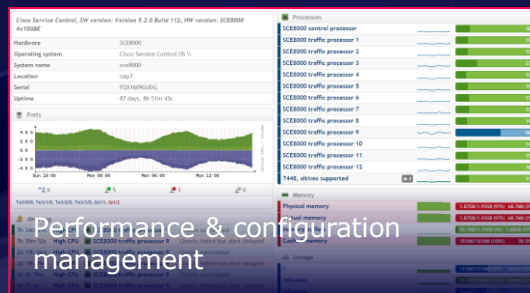
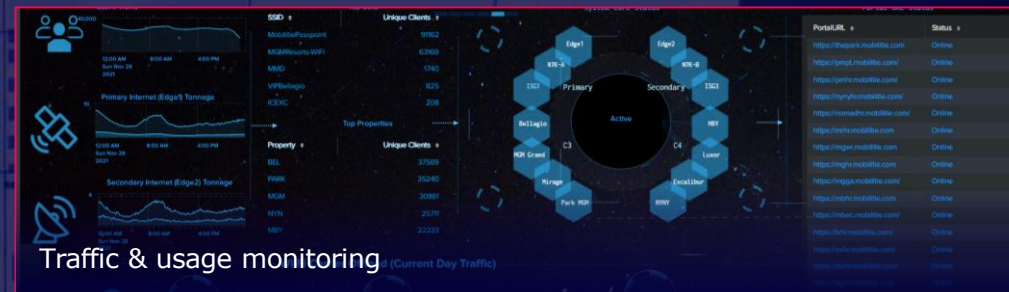
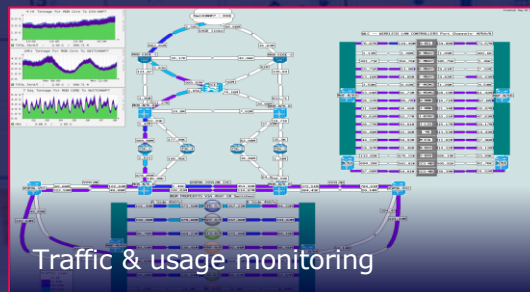
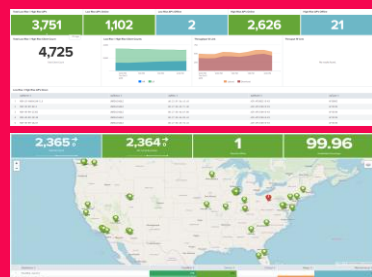
MONITORING AND MANAGEMENT TOOLS

Customer access tools

Service request portal



Network status dashboards



2

5G AND PRIVATE NETWORKS



“

The convergence of Industry 4.0, power plant digitization, and private networks is reshaping the energy landscape. Enabling smarter, more efficient operations, paving the way for a sustainable energy future.

■

HEADWINDS IMPACTING BUSINESS AND INDUSTRY

The turbulent economic environment is leading to an acceleration in the adoption of Industry 4.0

Revenue growth and maintaining profitability

Managing risk and health and safety

Positioning for growth and competitiveness

Managing rising energy and component costs

Managing the battle for talent

Achieving ESG/Net Zero targets

A backdrop of political uncertainty

The 4th Industrial Revolution

Industrial Revolution 1.0



1784
Mechanisation,
railways, steam
power, weaving loom

Industrial Revolution 2.0



1870
Electrical power,
mass production,
assembly lines

Industrial Revolution 3.0



1969
Electronics, automated
production & computers

Industrial Revolution 4.0

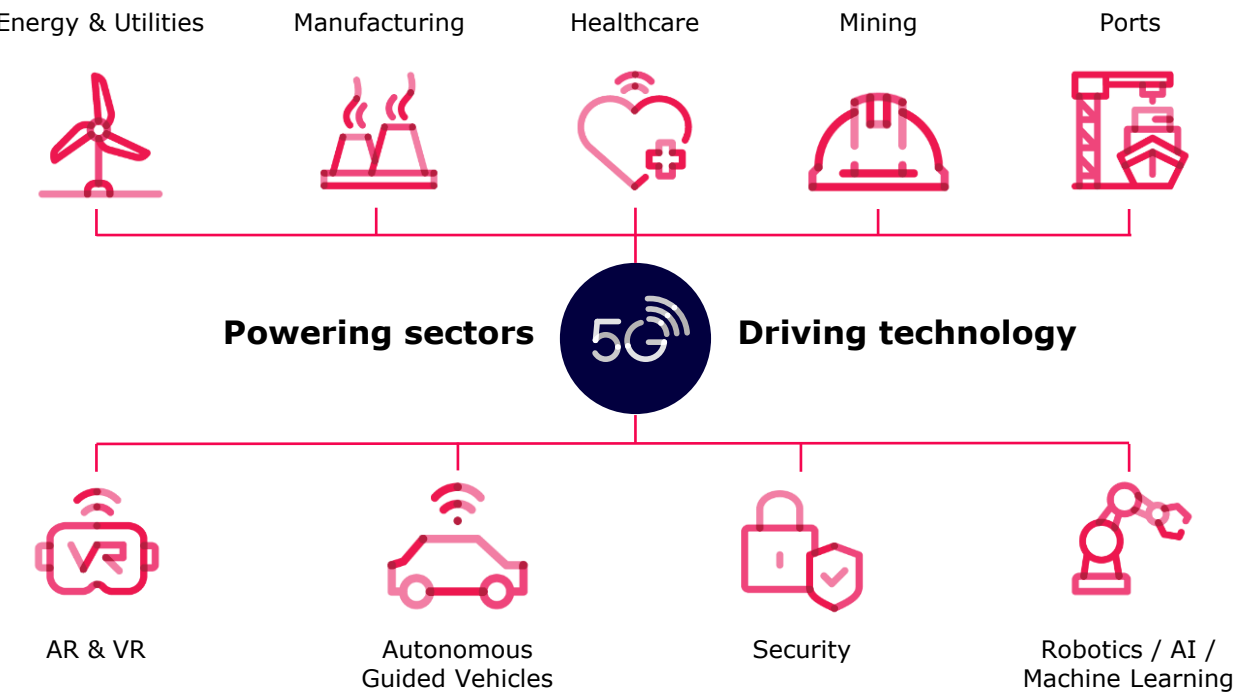


2015
IoT, AI, big data,
robotics...

PRIVATE NETWORKS

Industry 4.0 is accelerating the roll-out of Private Networks

Data remains local, even with cloud architecture



Full visibility and control of applications, data and condition from within enterprise dashboards

The need for guaranteed, low latency and high bandwidth connectivity is

- 1 Enabling Industry 4.0 use cases**
Remote operations, predictive maintenance, 3D asset tracking, robotic automation, autonomous factories, IoT enablement.
- 2 Replacing legacy voice communications**
Highly secure, reliable and resilient connectivity for security and safety applications for private industry and public sector (Push To Talk and Push To Video).
- 3 Bringing connectivity to remote and underserved locations**
Universities, transport hubs, mines, etc. For sites needing secure, always-on connectivity, mobility, and low latency.



THE BENEFITS



Wireless

No costly and bulky wires, impractical for connecting large numbers of small devices or dynamic environments where people, equipment or devices move.



Control

The customer organisation can have degrees of control over elements of the network including security, resource use and device prioritisation.



Low latency

Lower latency enabling real-time communication between devices.



High bandwidth

Supporting simultaneous uplink and downlink communication with a huge number of devices.



Highly secure

Security policies defined by the network operator and data is stored locally.



PRIVATE 5G NETWORKS AND WI-FI

Factors to consider



Environment

The size of the venue

The type of venue

The numbers and density of devices to be supported



Performance

The standards dictated by the use case or application:

- Latency
- Throughput
- Mobility
- Security



The user

Who are the users?

What is being supported: Information (IT) or Operational Technology (OT)?

What is the mix of people vs. machines/things?

What is the proportion of permanent vs. guest users?

IS A PRIVATE NETWORK RIGHT FOR YOUR BUSINESS?

To grow your business, ensuring your people have the right tools for the job and are safe, you need high-performing connectivity to support your business applications

	Indoor Applications	
	Private 4G/5G	Wi-Fi
Wide coverage	✓ Suitable for all	✓ Suitable for all
Mission-critical applications	✓ Suitable for all	- Load dependent
Highly secure for sensitive data	✓ Suitable for all	- Suitable for some
High throughput possible	- Suitable for some	✓ Suitable for all
Low latency	✓ Suitable for all	✓ Suitable
High volumes of devices	✓ Suitable for all	- Suitable for some
Mobility	✓ Suitable for all	- Suitable for some

Outdoor Applications	
Private 4G/5G	Wi-Fi
✓ Suitable for all	- Suitable for some
✓ Suitable for all	- Suitable for some
✓ Suitable for all	- Suitable for some
✓ Suitable for all	✗ Not suitable
✓ Suitable for all	- Suitable for some
✓ Suitable for all	- Suitable for some
✓ Suitable for all	- Suitable for some



COMPONENTS OF A PRIVATE NETWORK

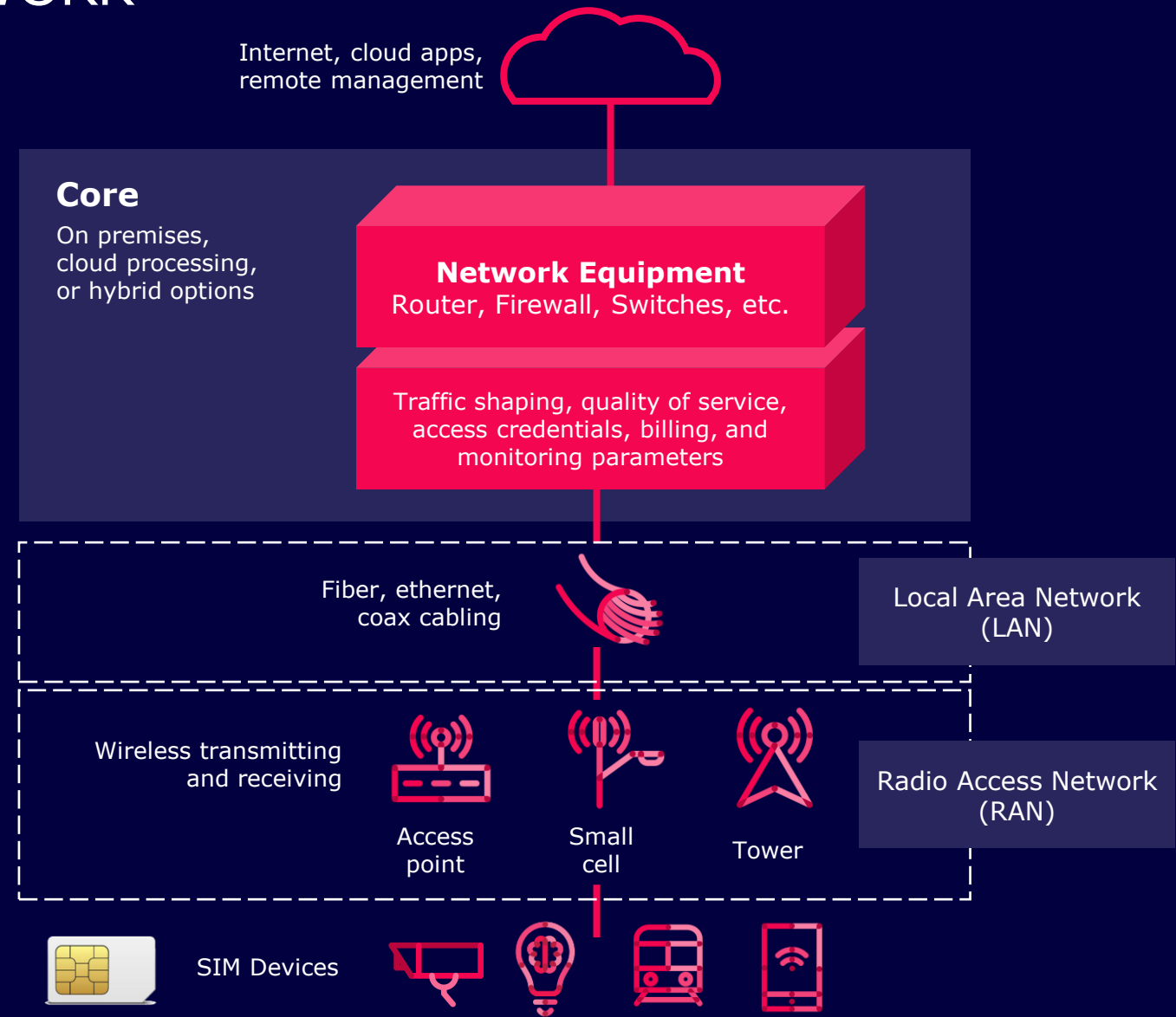
Licensed
Frequencies



Lightly
Licensed
Frequencies



Unlicensed
Frequencies



DIGITAL PARTNERS SHARING LAYERS

Bespoke solutions for your Private Network Connectivity and Communications

Additional services

- Mission Critical Communications (Push-To-Talk / Push-to-Video)
- Mobile Device Management and devices

Layer 3: Value Added Services (VAS)



Communications



MDM and devices



VAS
by partners

Management and operations of your network

High SLAs. Access your network performance dashboard

Layer 2: Network management and maintenance



Network performance dashboard



Network management



Care and maintenance

Designing and building bespoke private network

Our global ecosystem ensures we choose the right technology, designed for your needs

Layer 1: Private network component



Enterprise
mobile client



User
equipment



Spectrum



Radio access
network



Transmission
network



Local core
network



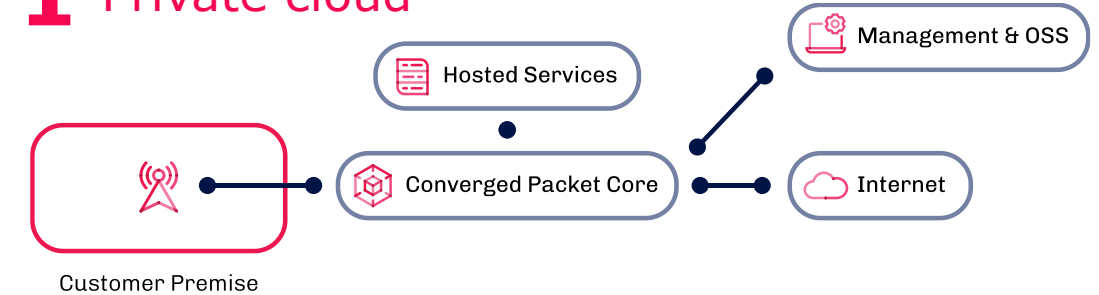
Enterprise
network
and apps

Network operators and management

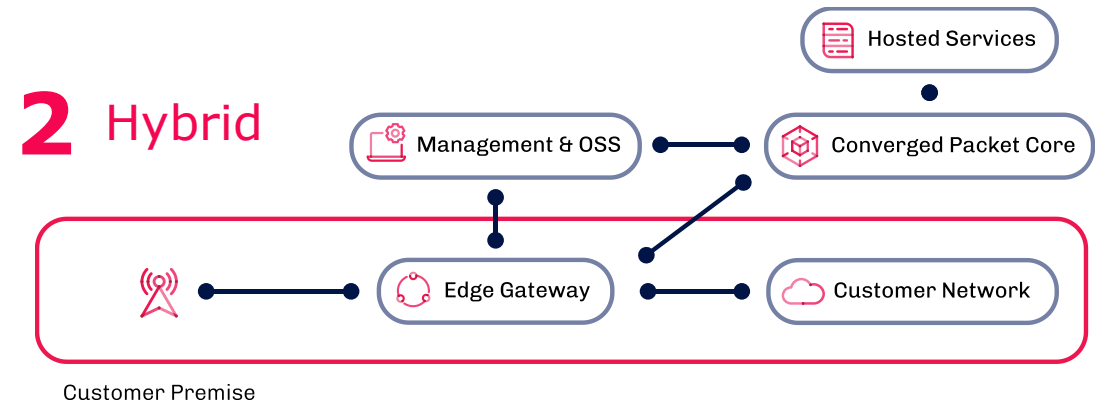
SECURE ARCHITECTURES

1. The Boldyn Private Network Platform supports three distinct architectures, all centrally orchestrated and managed
2. Transport connections between Boldyn's Converged Packet Core and the Customer Premise include direct fiber, Metro Ethernet, or secure Internet transport
3. Internet access for wireless end-devices can be delivered as part of a managed connectivity service, or can be dropped off locally to use the customer's existing Internet connectivity
4. The platform adopts **ISO 27001** and **NIST** security standards, so your network and data is always secure.
5. Hybrid Architecture is typically referenced for best-of-both-world considerations but not always required or practical.

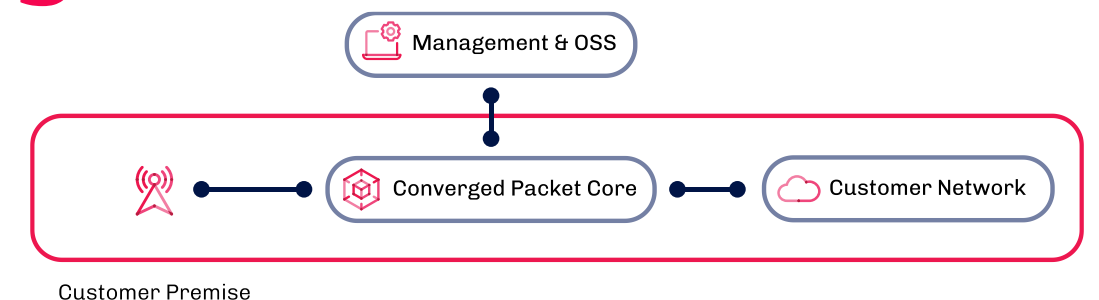
1 Private cloud



2 Hybrid



3 On premise



3

SAMPLE USE CASES IN ENERGY SECTOR

THE PATH TO DIGITALIZATION STARTS WITH RELIABLE CONNECTIVITY

Energy Industry is increasingly implementing innovation with a wide range of technologies to:

1

Improve worker efficiency and safety

Enable seamless communication without blind spots and remove people from hazardous areas by using drones and robots

2

Automate and optimize operations

IoT sensors and extensive data collection for enterprise-wide asset management and resource planning

3

Increase security

Extended video surveillance and infrared cameras

4

Optimize maintenance planning

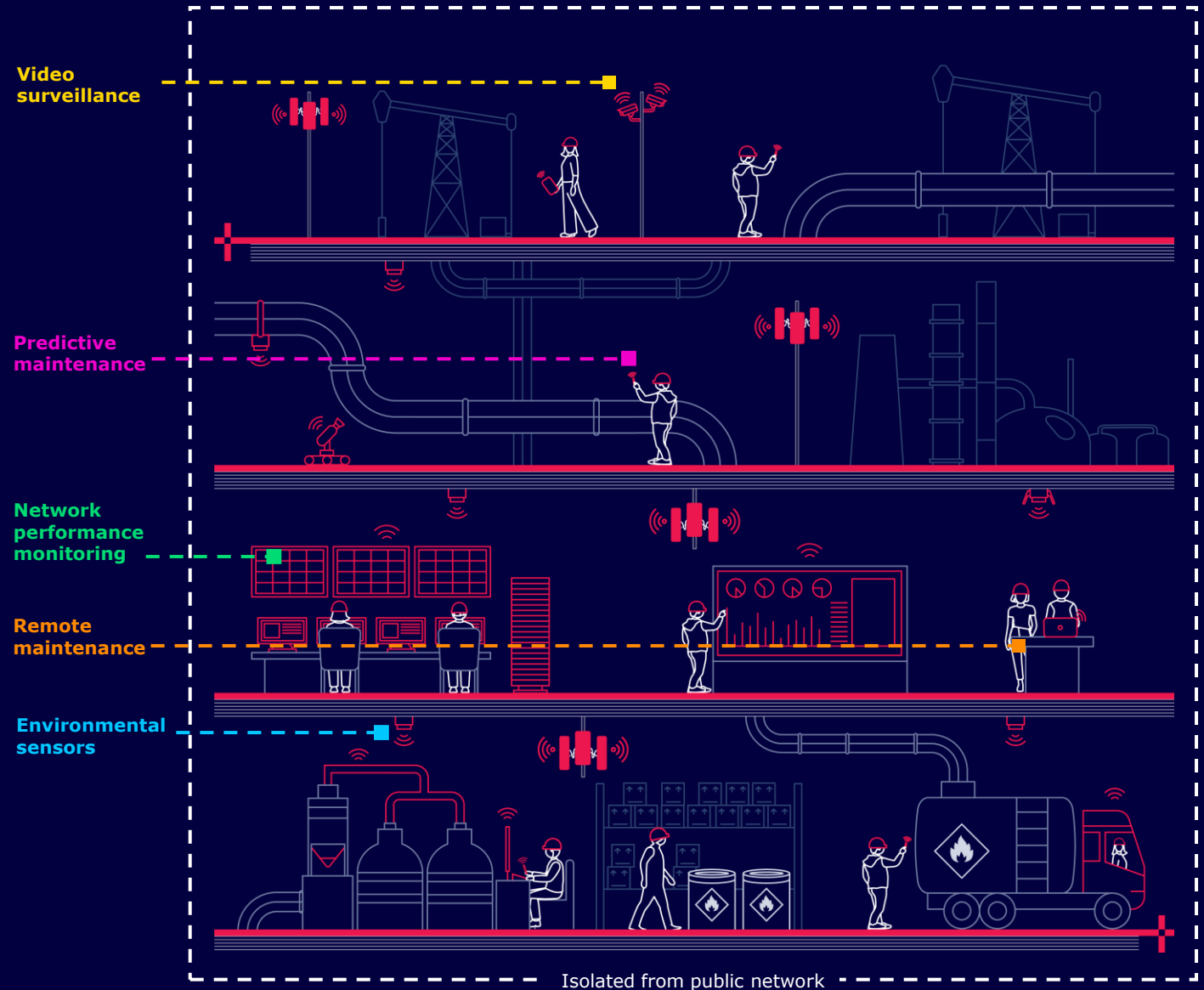
Monitoring the health of assets in real-time. Optimizing maintenance schedules. Remote maintenance

All of which require reliable connectivity between devices, assets and equipment



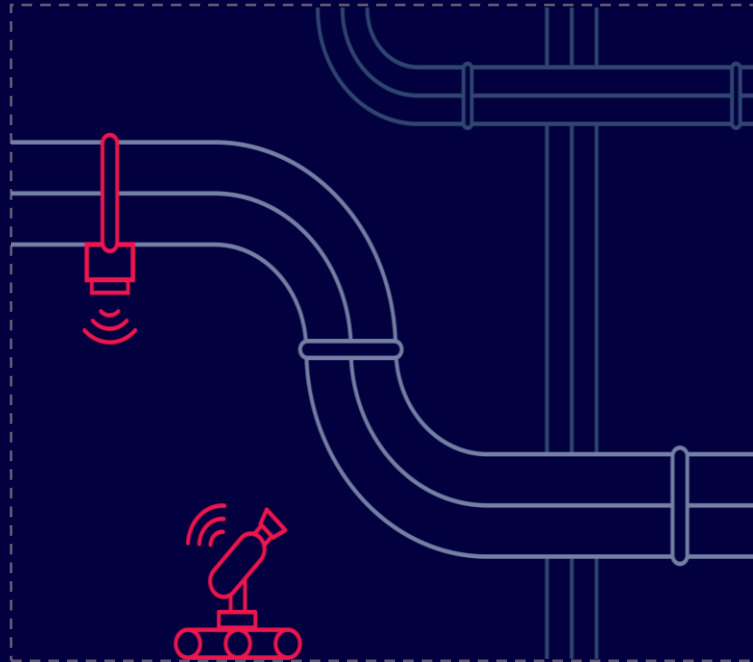
IDENTIFIED USE CASES ON THE OILFIELD

- Dedicated 4G/5G coverage for your digital transformation
- Connecting assets, people and devices even in challenging indoor and outdoor environments
- Enabling automation, digitalization and communication
- 100% tailored to the area and use cases
- 100% controlled by the enterprise, fully autonomous
- Improving security. Data stays on site



PREDICTIVE MAINTENANCE

Reduce maintenance cost and planning time, increase equipment availability



Connected surveillance cameras, drone

- Private networks allow insanely fast data speeds, making real-time status updates possible



Data Integration Applications

Collect data, send to the operating center for processing and analyzing information



Assets Monitoring

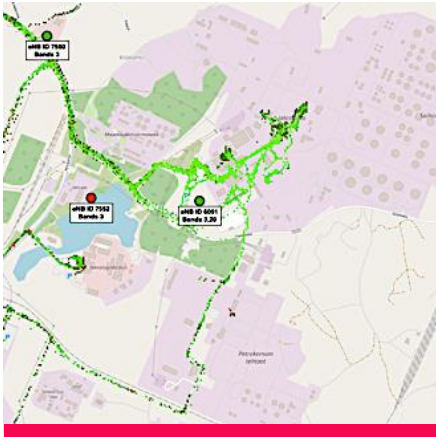
Monitor equipment, collect data and calculate for the best moment of maintenance



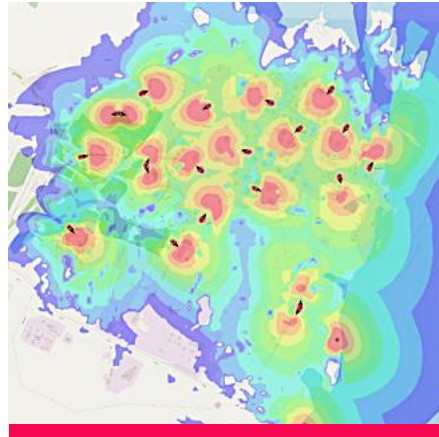
PREDICTIVE MAINTENANCE

Use case by confidential client

- Video surveillance and predictive maintenance of 30.000 km of pipelines
- Utilizing thermal cameras for remote monitoring and diagnostics



**Coverage by
Public network**



**Tailored coverage
by Private network**

Site-wide network coverage without blind-spots is essential to secure continuous operations and uninterrupted predictive maintenance and surveillance of pipelines in the refinery



REAL-TIME COMMUNICATIONS



Push-to-talk, Push-to-video

Connect control center with workers in remote areas, coordinating joint actions



Advanced radio access technology

Maximum coverage and capacity to connect assets and people, improve situational awareness

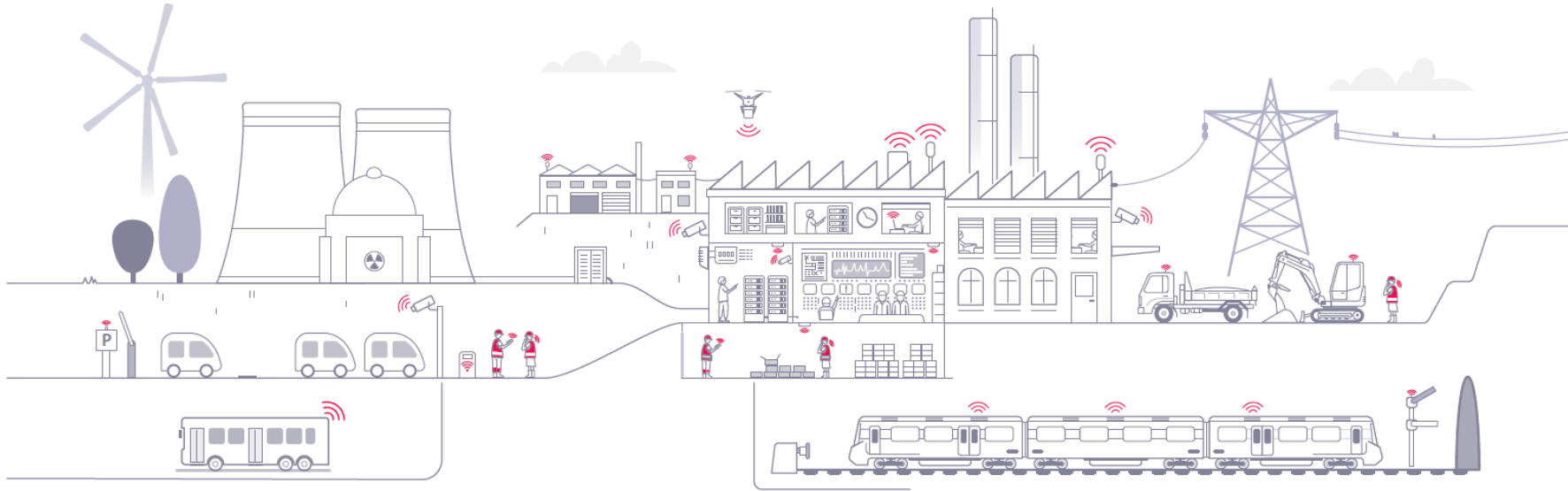


Emergency and disaster recovery

Real-time geo location to track and monitor all emergency units for quick response to any unexpected situation

SUCCESS STORY

Private LTE Network & Communications System for a Nuclear Power Plant



CHALLENGE

Ensuring seamless communication for enhanced safety and efficiency

- Legacy phone system hindered real-time communication
- Lacked features for future digitalization efforts
- Upgrading to a more robust and secure solution became essential.

SOLUTION

A first-of-its-kind 4G Private Network delivers secure and group communication

- First-of-its-kind solution for a nuclear power plant
- Group communication with data, voice (VoLTE), push-to-talk (PTT), and push-to-video (PTV)
- Improved collaboration and faster response times
- Secure communication for all personnel
- High security and subscriber encryption

BENEFITS

Enhanced security, streamlined operations, and a foundation for future growth

- Seamless connectivity across vast areas, including indoor, underground, and outdoor locations within the nuclear power plant
- High-security architecture safeguards sensitive data and restricts unauthorized access
- Real-time data entry via mobile devices streamlines workflows and saves time
- Seamless connectivity across vast areas (indoor, underground, outdoor) empowers field personnel
- Lays the foundation for future digitalization initiatives (AR/VR) for enhanced maintenance
- Increased efficiency, cost savings, and competitive edge within the nuclear power industry



PARTNERING IN SERVICE ASSURANCE



Enterprise in control

Boldyn configures and operates the wireless private network based upon the requirements of the enterprise client, not a wireless operator.



Managed service

Boldyn invests its capital to design, build, operate and upgrade the network over the term as a monthly managed service.



Contractual service levels

Boldyn defines and delivers on the performance service levels necessary for our clients to effectively operate their business.



Technology forward

Throughout the term, Boldyn is responsible to enable network refresh upgrades as technology advances beyond 5G, Wi-Fi 6/7 and CBRS.



Diverse use cases

Security
Point of sale
Food & beverage
Ticketing
Digital media
Analytics
Communications

4

OPEN GROUP DISCUSSION

OPEN GROUP DISCUSSION

WHAT ARE YOU TRYING TO CONNECT?

From Applications at the Network Core to People and Devices connected at the Network Edge



DISCUSS YOUR CHALLENGES AND DIGITALIZATION STRATEGY

How to begin Mapping your Use Cases to a Strategic Business Case



A long-exposure photograph of an industrial facility, likely a power plant or refinery, at night. The scene is illuminated by various lights, creating a vibrant display of colors. Several tall smokestacks are visible, some with red and white striped patterns. In the foreground, there are bright, horizontal light trails from moving vehicles, suggesting a busy road or highway. The sky is dark, and the overall atmosphere is one of industrial activity and energy.

UNLOCK THE
POWER OF AN
INTERCONNECTED
FUTURE

The logo for boldyn NETWORKS. The word "boldyn" is in a lowercase, sans-serif font, with a small red square above the letter "d". Below "boldyn" is the word "NETWORKS" in a smaller, uppercase, sans-serif font.

boldyn
NETWORKS