Ambra solutions

AMBRA SOLUTIONS

PIVATE LTE(4G)/5G CONNECTIVITY SOLUTIONS

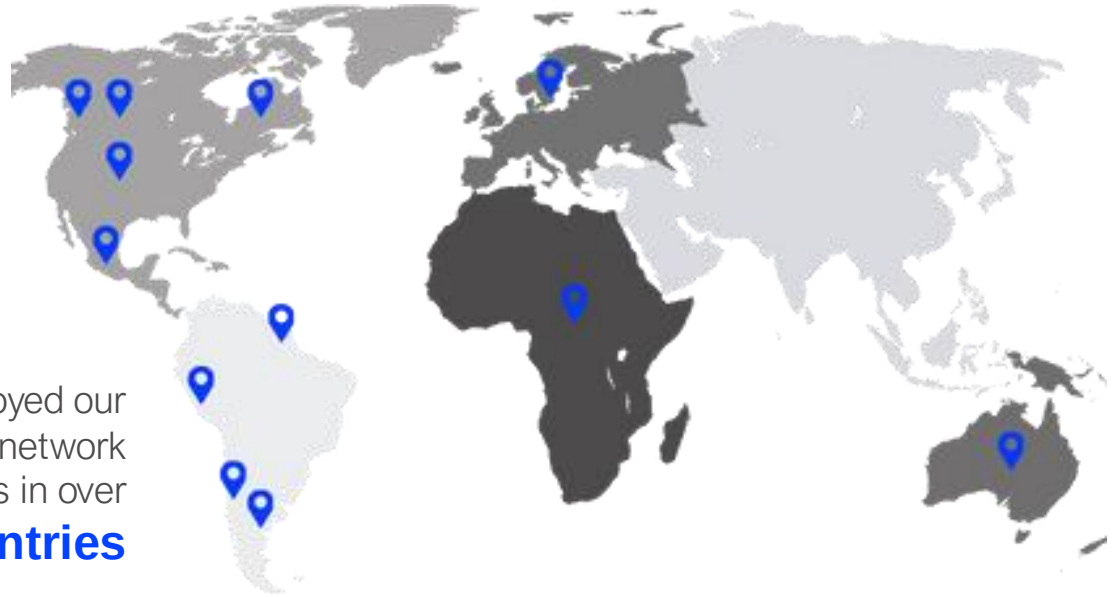
BUSINESS PRESENTATION

EXPOMIN 2025

AMBRA SOLUTIONS' EVOLUTION

CONNECTING AND EVOLVING INDUSTRIES AROUND THE WORLD

We have deployed our Private LTE/5G network solutions in over **10 countries**



900km
Of underground Private LTE/5G connectivity deployed

18 years
Of expertise, founded in 2007

45% growth
Over 5 years

70+
Industrial projects and use cases

About us:

Ambra Solutions is the world leader in the deployment of private 4G/5G networks. The engineering firm, founded in 2007, is revolutionizing telecommunications for mission-critical operations. Ambra Solutions prides itself on being an integrator of state-of-the-art technology and a manufacturer of customized products tailored for sustaining harsh environments. Their team of highly specialized engineers and technicians distinguishes itself by a thirst for doing the impossible and a passion for offering personalized solutions, thereby transforming contracts into partnerships.

AMBRA SOLUTIONS

CONNECTIVITY BEYOND CONNECTION

1

What we do :

- RF & IP engineering
- Out-of-the-box deployment kits
- Industry-tailored LTE/5G devices
- 24/7 technical support

2

What we enable :

- Real-time assett-tracking (machines, equipment and personnel) & gas detection
- Remote-operation
- Automation
- Integration of third party systems

3

Our key differenciators :

- Mission-critical design criterias (99.999% which correspond to 5min max downtime per year)
- Uniform solution across all countries (vs. mobile operators can only deploy a solution in their country)
- Complete ownership & autonomy over the deployed network

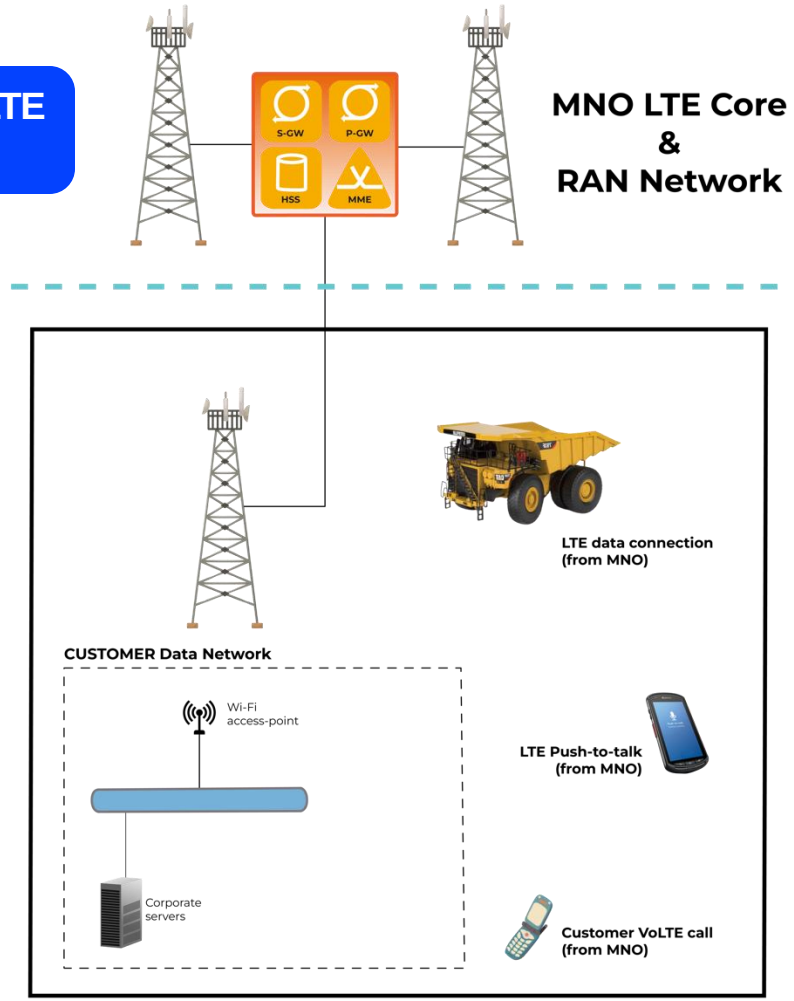
Private LTE/5G

Connectivity creating a smarter industry

PUBLIC VS. **PRIVATE LTE/5G NETWORKS**

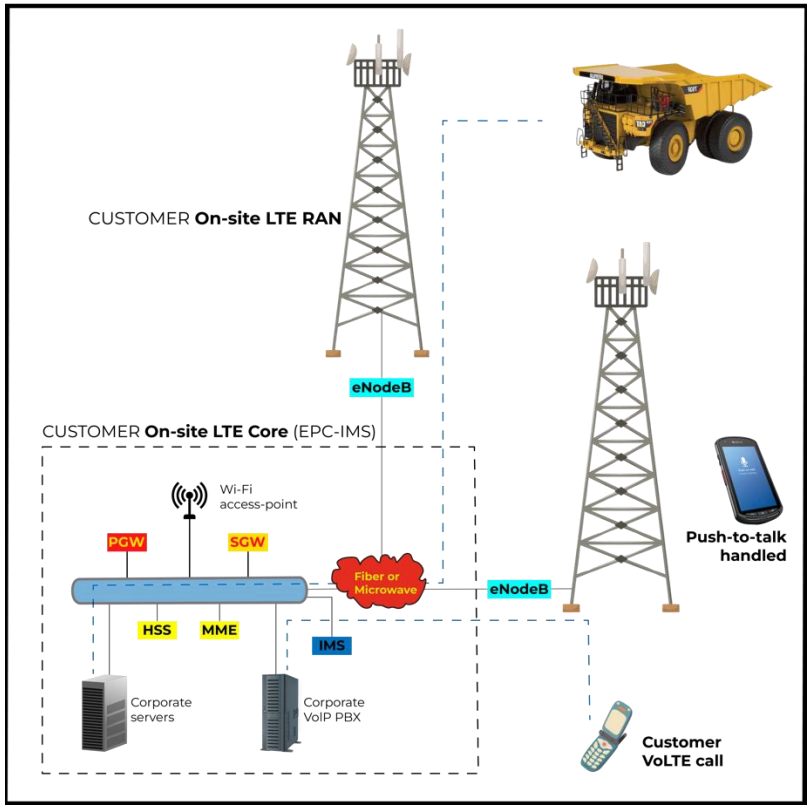
KEY DIFFERENCES

Commercial LTE Network :



vs.

Private LTE Referenced Network :



WIFI VS. **PUBLIC LTE** VS. **PRIVATE LTE**

KEY DIFFERENCES

WI-FI AND PUBLIC LTE

INTERFERENCE

CONGESTION

NO CONTROL OVER THE SOLUTION

NO MISSION-CRITICALITY ON WIFI
(LACK OF DEDICATED BANDWIDTH)

UNSTABLE LATENCY

AMBRA'S PRIVATE 4G/5G

LOW LATENCY

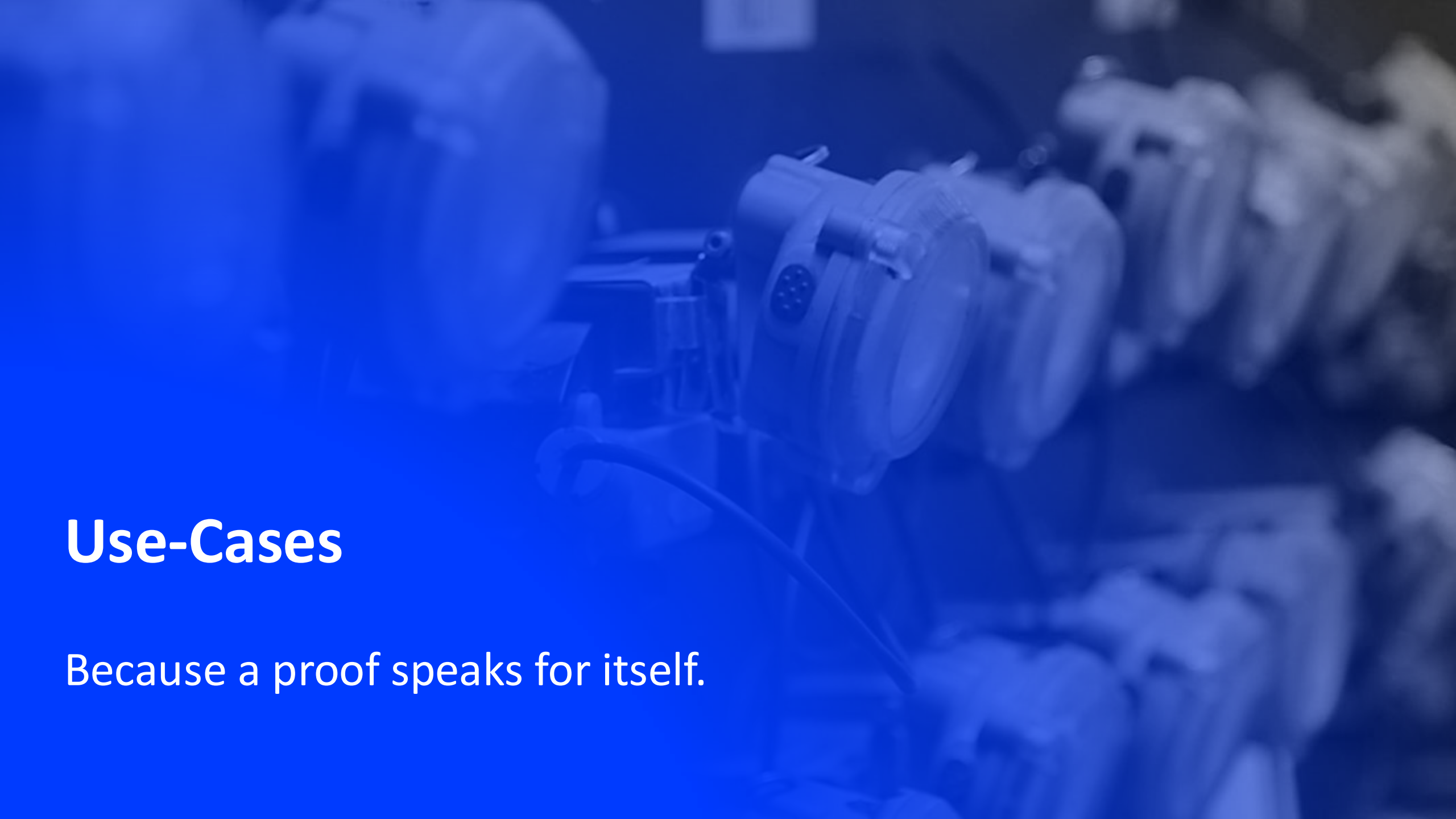
DEDICATED BANDWIDTH

RELIABILITY AND REDUNDANCY

QUALITY OF SERVICE

REQUIRE LESS INFRASTRUCTURE COMPARED
TO WI-FI TO COVER LARGE AREAS

SEAMLESS MOBILITY



Use-Cases

Because a proof speaks for itself.

APPLICATIONS

AMBRA'S PRIVATE LTE/5G SOLUTIONS ENABLING :

1 Real-time positioning

- Ambra developed reliable & rugged products
  - Beacons
  - Modems
- Customized iPS interface
  - Mine 3D mapping
  - Real-time tracking of human & material resources

2 Telemetry

- Asset analytics
  - Engine condition
  - Fuel level
  - Jammed or defective machinery

3 Voice & video communications

- Push-to-talk
- Connected devices / one-device-for-all

4 Integration with existing equipment

Ex. : Connect existing vehicles to the network with beacons & modems

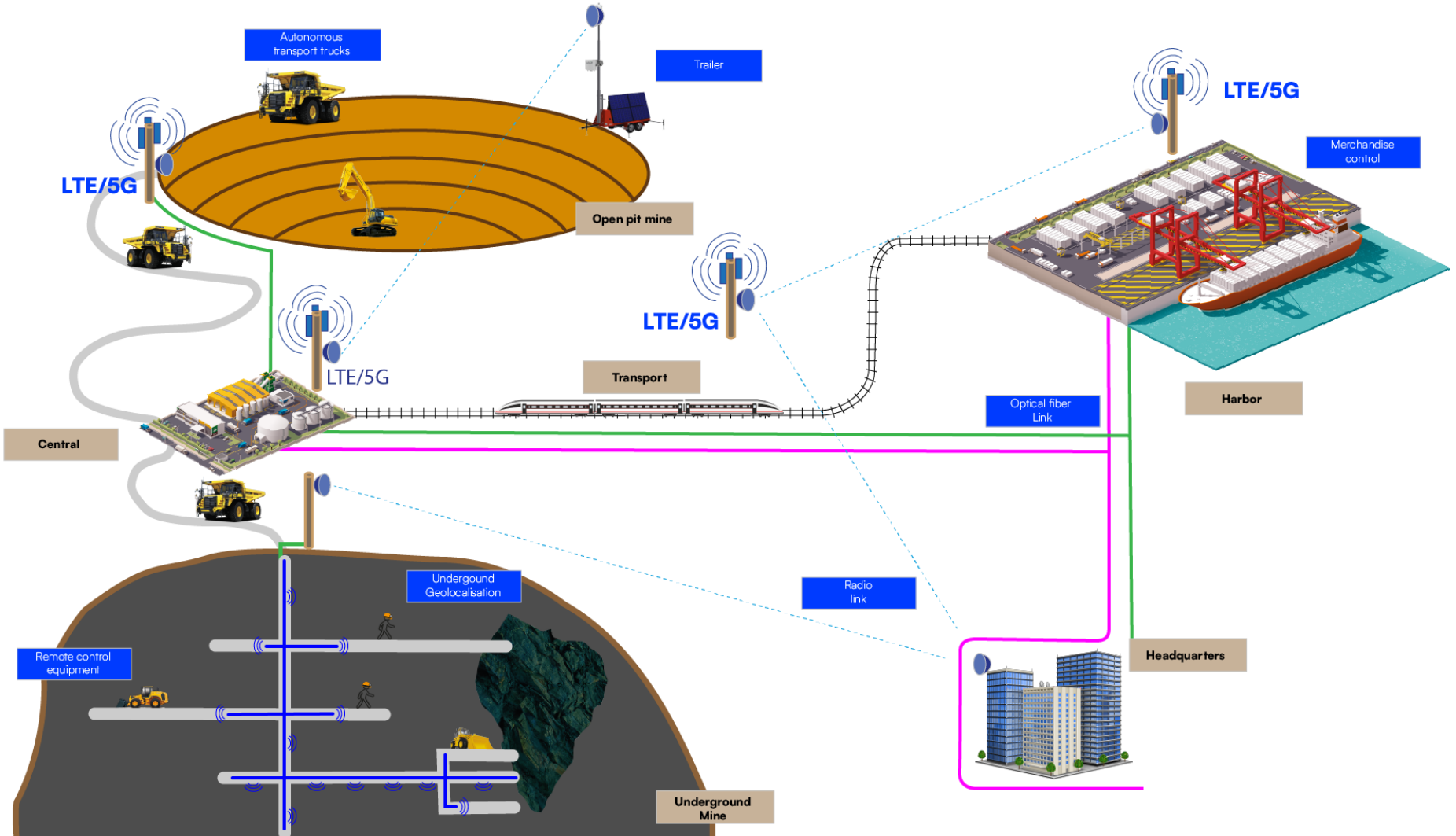
5 Integration with third-party systems

- Integration of intelligence developed by third parties + connection to the dashboard / control center

6 IoT (Internet of things)

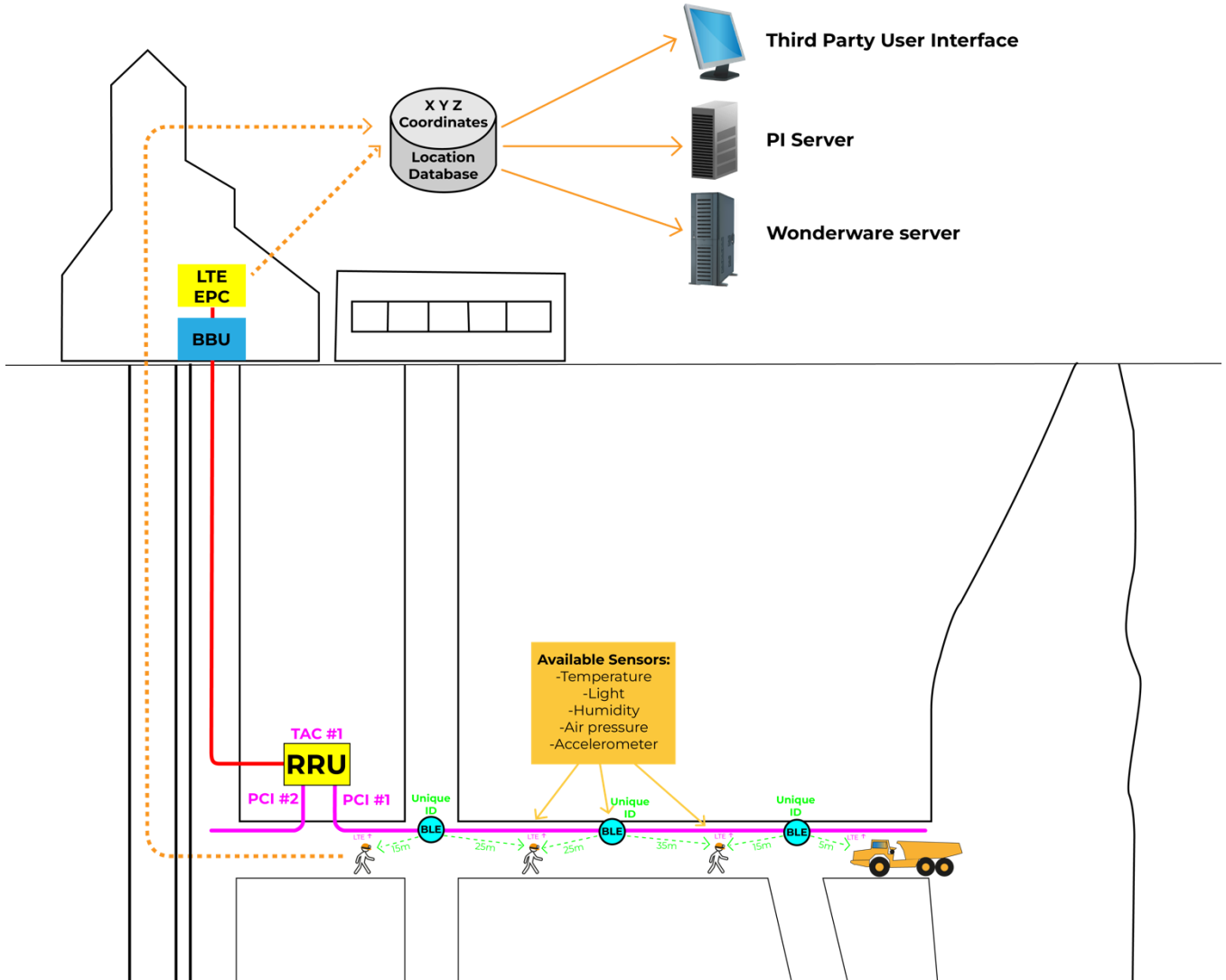
- Fully integrated system
- Data gathering converging in one dashboard / control center
- Customized dashboard tailored to the mine's needs
- Remote-operation & automation

5G USE CASES IN MINING



REAL-TIME ASSET TRACKING

OPEN-PIT & UNDERGROUND



Basic Location Tracking

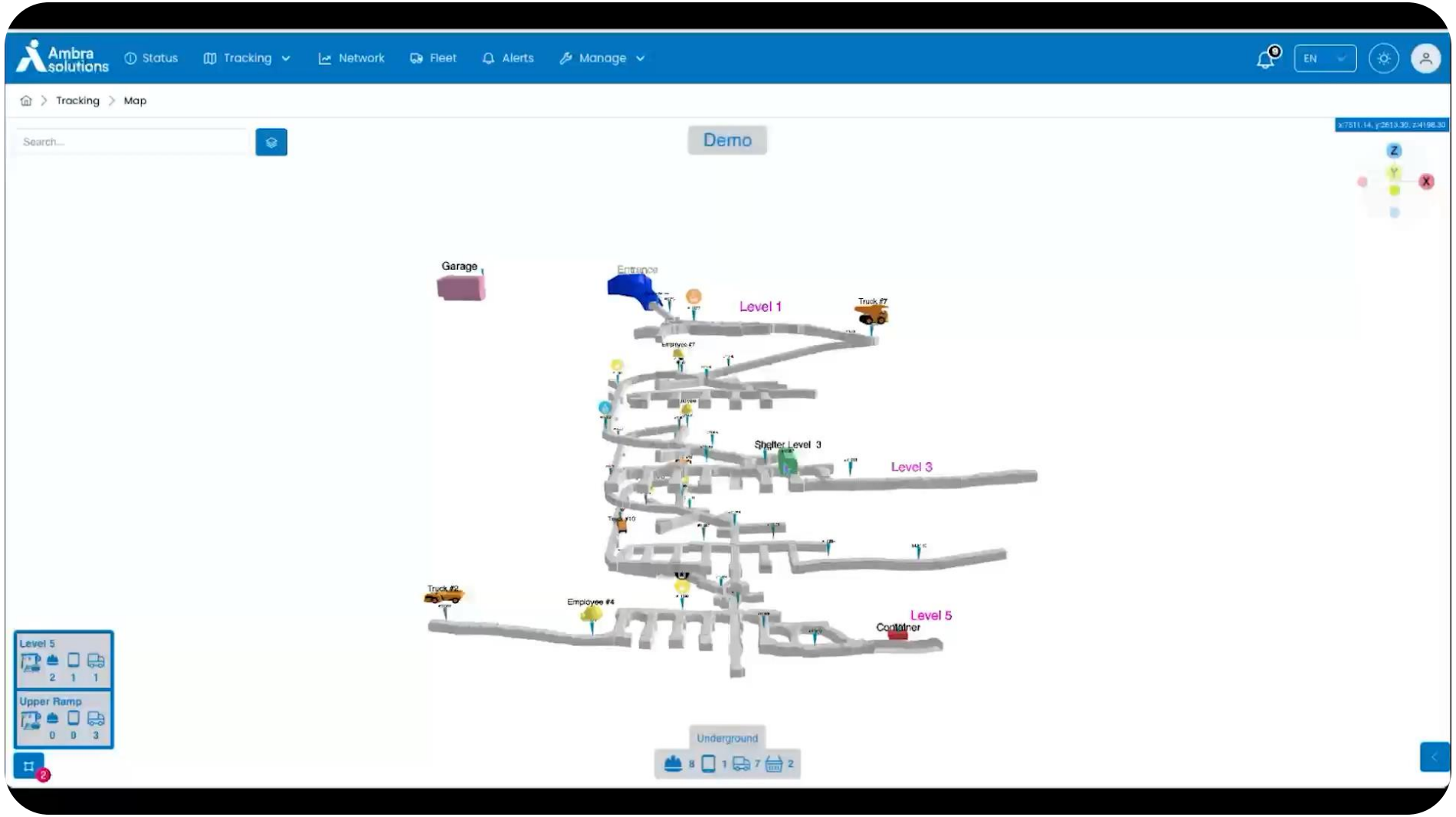
- Per LTE physical Cell ID. Typically one Cell-ID (PCI) per level
- Precision: 500m - 1 km

Advanced Location Tracking

- Using external Bluetooth beacons
- Low cost/power Bluetooth beacons installed on the walls
- Precision: Less than 50 m
- LTE + Bluetooth readers located on
  - Helmet
  - Phones
  - Vehicle

3D VISUALISATION

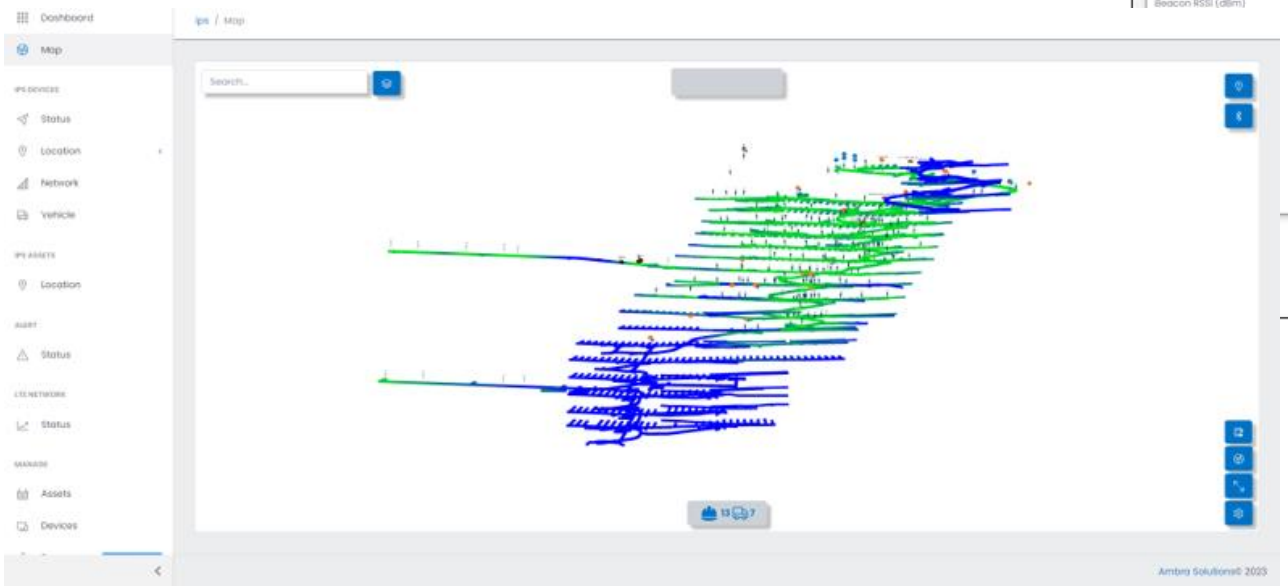
ON AMBRA'S INTELLIGENT POSITIONING SYSTEM INTERFACE



DYNAMIC HEAT MAP

Based on :

- Live traffic
- LTE Signal strength
- Road quality
- Air quality



AMBRA SOLUTIONS' PRIVATE LTE/5G

KEY DIFFERENCIATORS

IMPROVED CYBERSECURITY

Which is based APN *(Access Point Name)* and provides advantages vs. simple cryptography

REDUNDANCY

Established for private networks and meeting requirements vs. accepting the given availability of public networks

METADATA

Capabilities which are a prerequisite for precise geolocation, trends, patterns

EQUIPMENT AVAILABILITY

and associated costs which are driven through worldwide standards, Internet of Things (IoT)

QUALITY OF SERVICE

Based on :

- A bandwidth supporting millions of data streams
- A new level of latency as a prerequisite to support real-time operations,
- An availability level as a prerequisite to support mission critical systems
- The symmetry of up- and download speed symmetry enabling data generation and capture
- Advance error handling, which is much more dynamic, and can be requirements based
- A local framework for providing converged voice and data processing, local EPC (evolved packet core)

Ambra solutions

Beyond connection.

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