

Novel monitoring and control architectures for wind generation management



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 745625.

CHALLENGES AND TRENDS IN RENEWABLE GENERATION MANAGEMENT

Key business challenges driving wind generation Management



Growth

UE penetration >50 % by 2030



Capacity
distribution

**New installations of
smaller size and more
distributed**



Production
Maximization

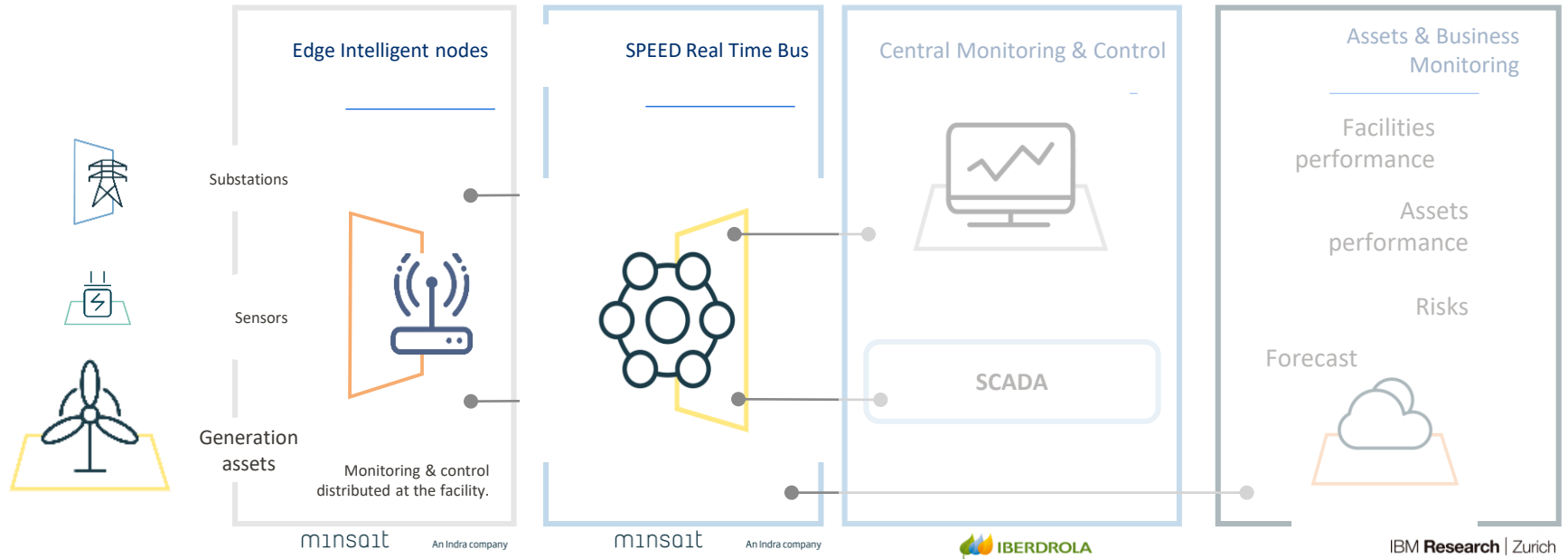
Production maximization



Opex costs
Minimization

Costs reduction

The Hybrid Edge/Cloud architecture



'Offshore' Reliability & Performance

Distributed intelligent monitoring and control at facility level automatically protecting and maximizing assets performance and lifespan.

Precise monitoring & control

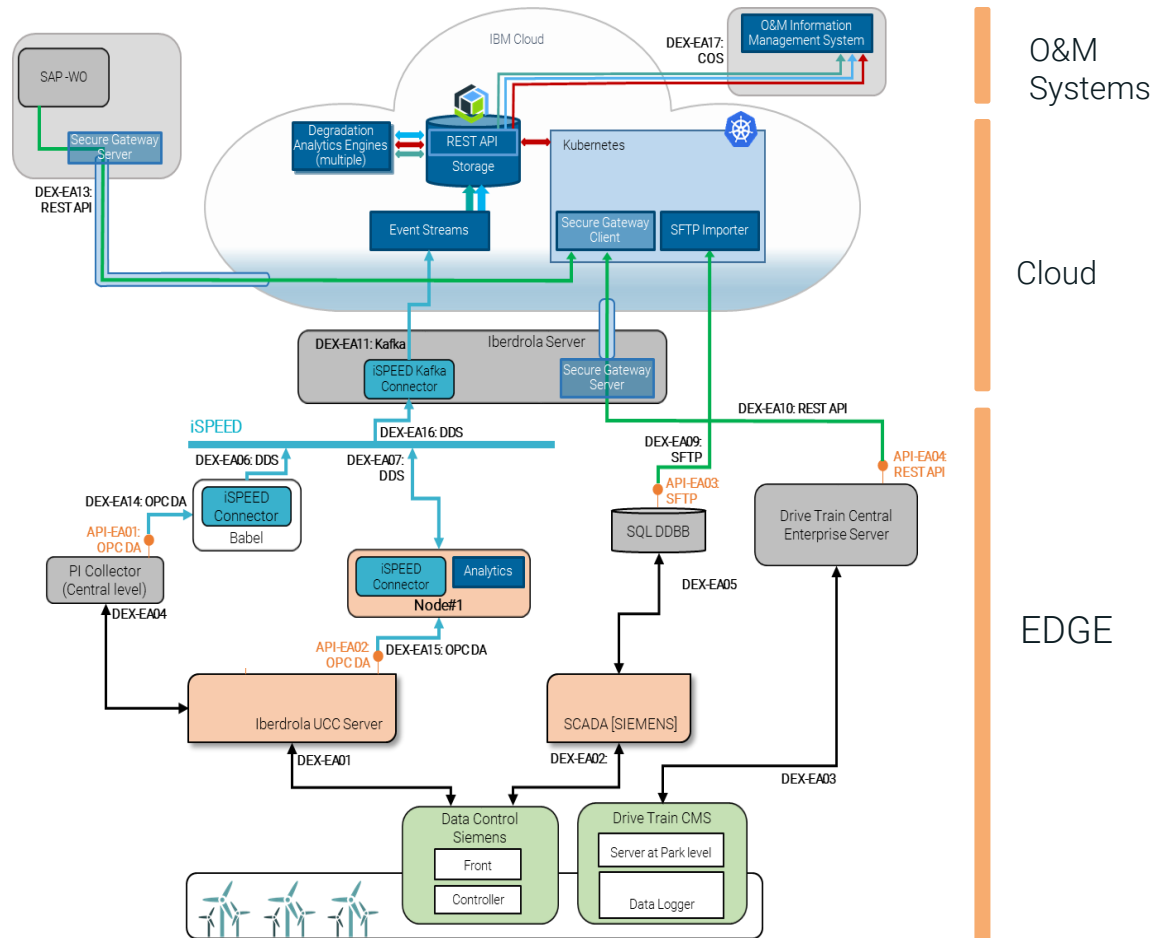
x10 – x100 signals processing capability, allowing for more precise monitoring and control.

Reduction of Operation & maintenance costs

Minimum volume/maximum value communication.

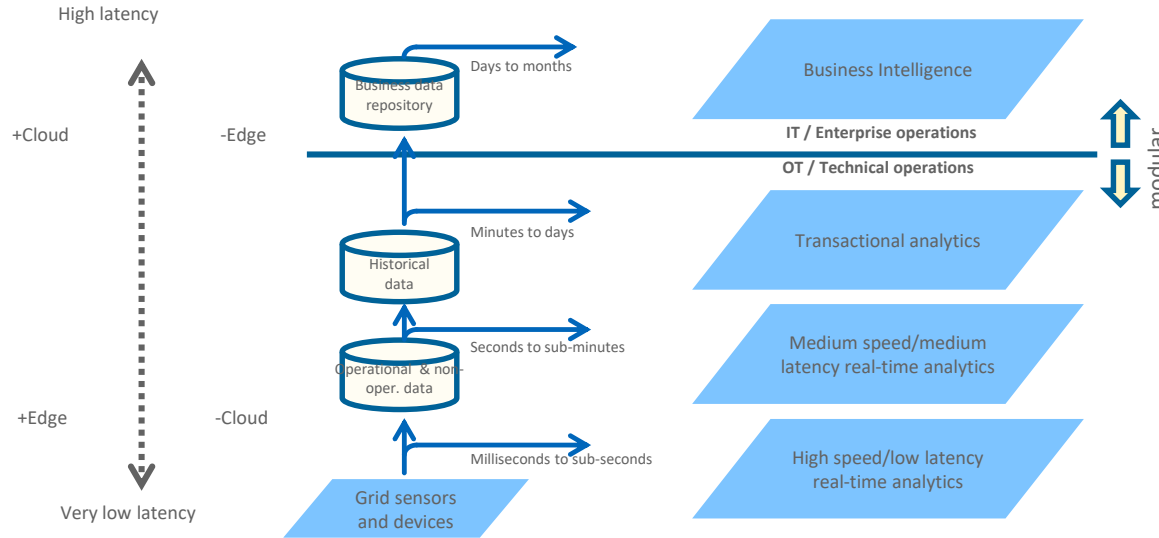
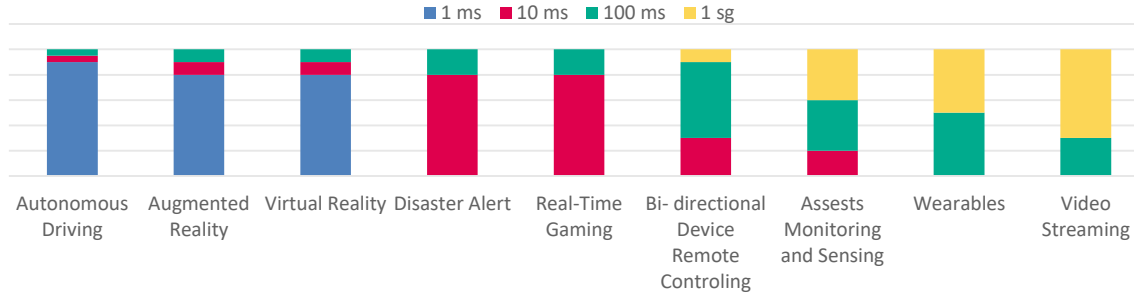


Hybrid cloud/edge architecture-ROME0



The Edge Value

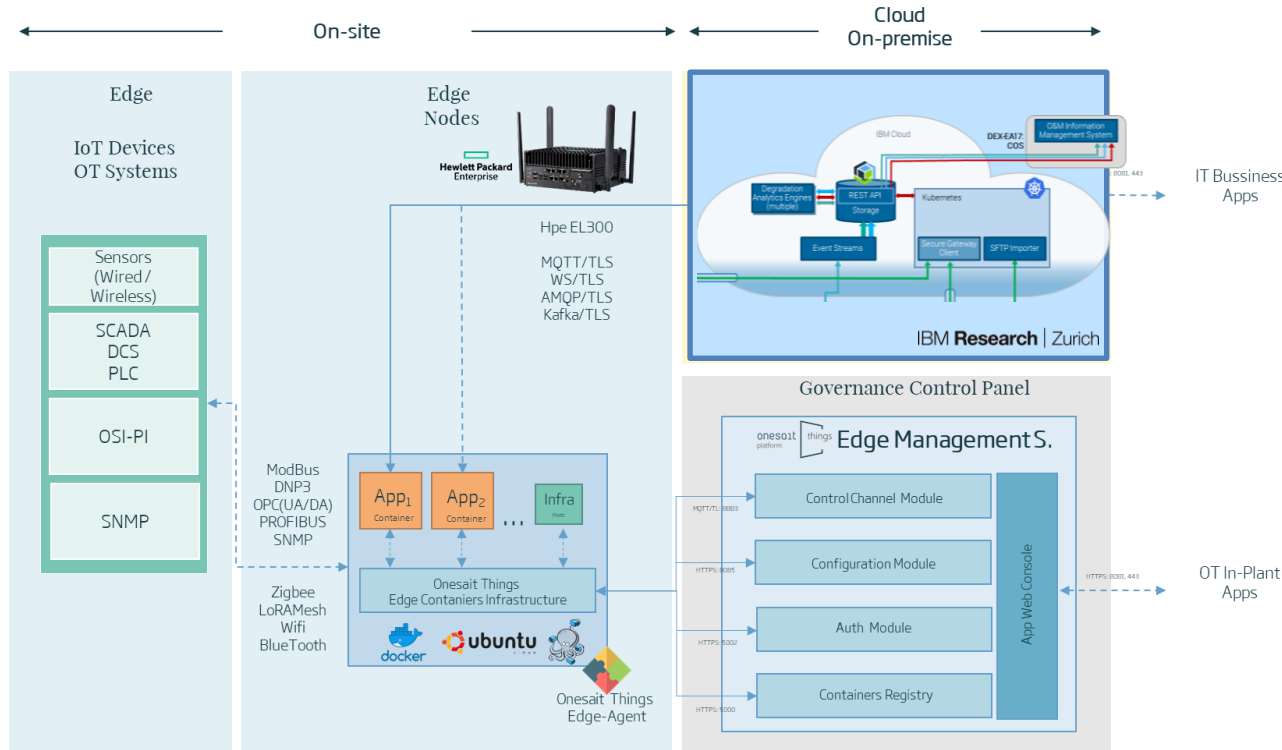
The case for intelligence and control distribution



The keys for control distribution

- ✓ **Hybrid strategy** to process data near where they are generated. Increase in speed, safety and cost reduction.
- ✓ Real-time convergence IT / OT.
- ✓ **Digital Twin**
- ✓ **Independent of the hardware** manufacturer
- ✓ **Proactive control** of the installed park, **management and provision** of software at any point in the system
- ✓ **Security** end-2-end
- ✓ **AI end-2-end** depending on the latency required.
- ✓ **Optimized workload distribution** between nodes and edge servers.

The Edge architecture at the wind park



Distributed intelligent monitoring and control at Park level based on “Distribution of virtual machines”

Optimized \$/tag minimum information volume maximum value.

x10 – x100 signals processing capability, allowing for more precise monitoring and control Performance and security



The key value for Edge

Interoperability- Within the park



- Maintain full compatibility with the measurement and instrumentation equipment currently and deployed OT communications protocols (Modbus TCP / RTU, OPC- UA / DA, etc.).
- Be independent of the Edge Device or IoT Device hardware provider.

Interoperability – From the park to the dispatch center



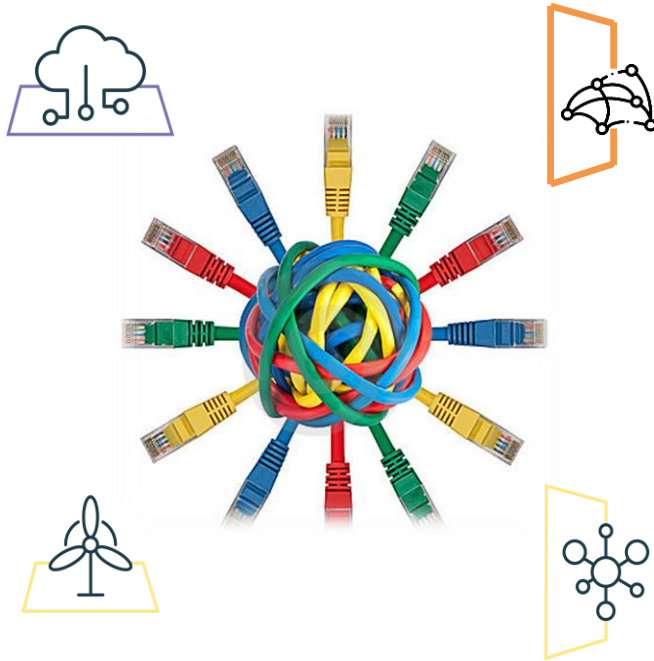
- Having complete technological independence to incorporate new IIoT / IoT protocols for both cloud communication (MQTT / Restful, AMQP, etc.) and in the management agents employed by the different providers.
- Deploy a software architecture focused on packaging components in containers fully integrated with current main Cloud providers (IBM IoT Platform, Azure, AWS, etc.).

Escalation and ecosystem



- Provide the necessary tools for the Governance of the infrastructure and software components, necessary to ensure the scaling of the solution up to thousands of points.
- Support a large number of applications deployed on Edge, which enables the Customer to configure an open ecosystem for third-party solutions.

Babel the value of interoperability



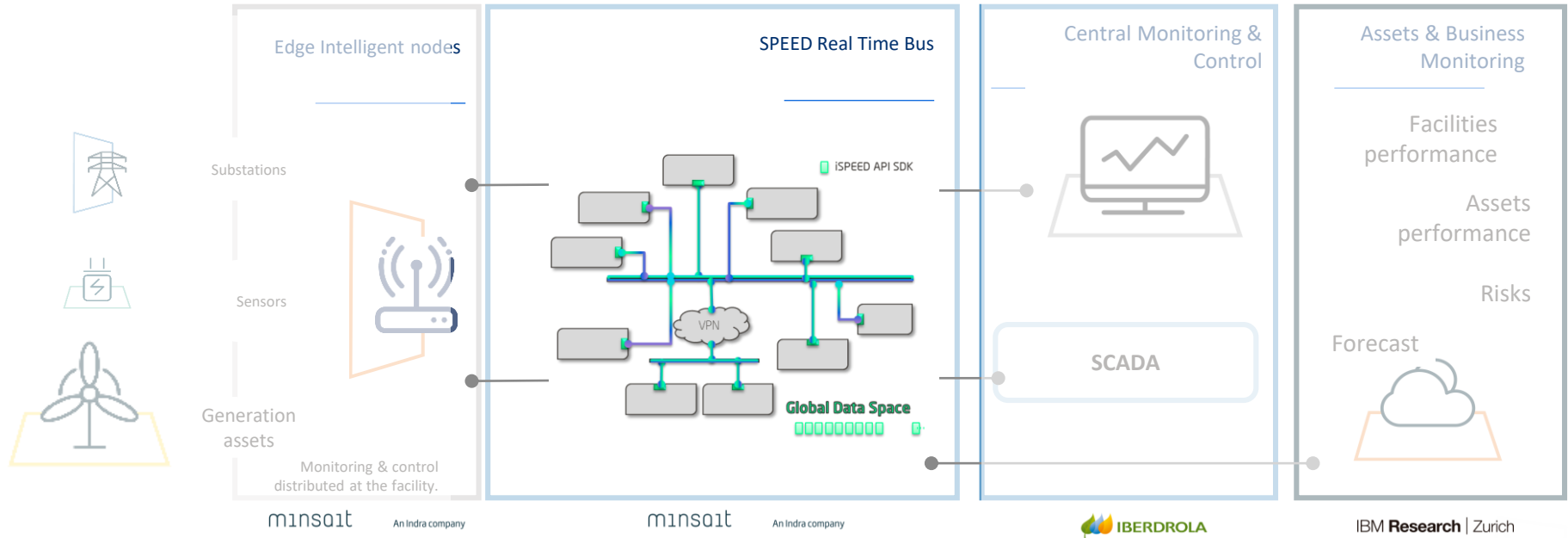
- IEC 60870-5-104, Master y Slave
- IEC 60870-5-101 Master
- ICCP (IEC 60870-6. TASE. 2) Client/Server
- OPC DA Client
- OPC-XML Client
- OPC UA Client
- Modbus RTU, TCP and Modbus over TCP Master
- DNP3.0 Master
- MQTT
- DDS iSpeed Pub/Sub
- ODBC Client.
- IEC 61850 MMS Client
- IEC 60870-5-103 Master
- PROCOME v1 Master
- PROCOME v3 Master
- Courier Master
- OPC UA Server
- ... On demand

High Availability Support for both Classical Hot-Standby and Orchestrated containerized HA management

Horizontal Scalability .Can be deployed in all the range from Edge Embedded to Cloud Front-End configurations. (Dockerized)

Vertical Scalability Tested with more than 200.000 points per instance * Multiple instances on top of the same HW.

RT Common Data Space



Open RT Unified Data Space

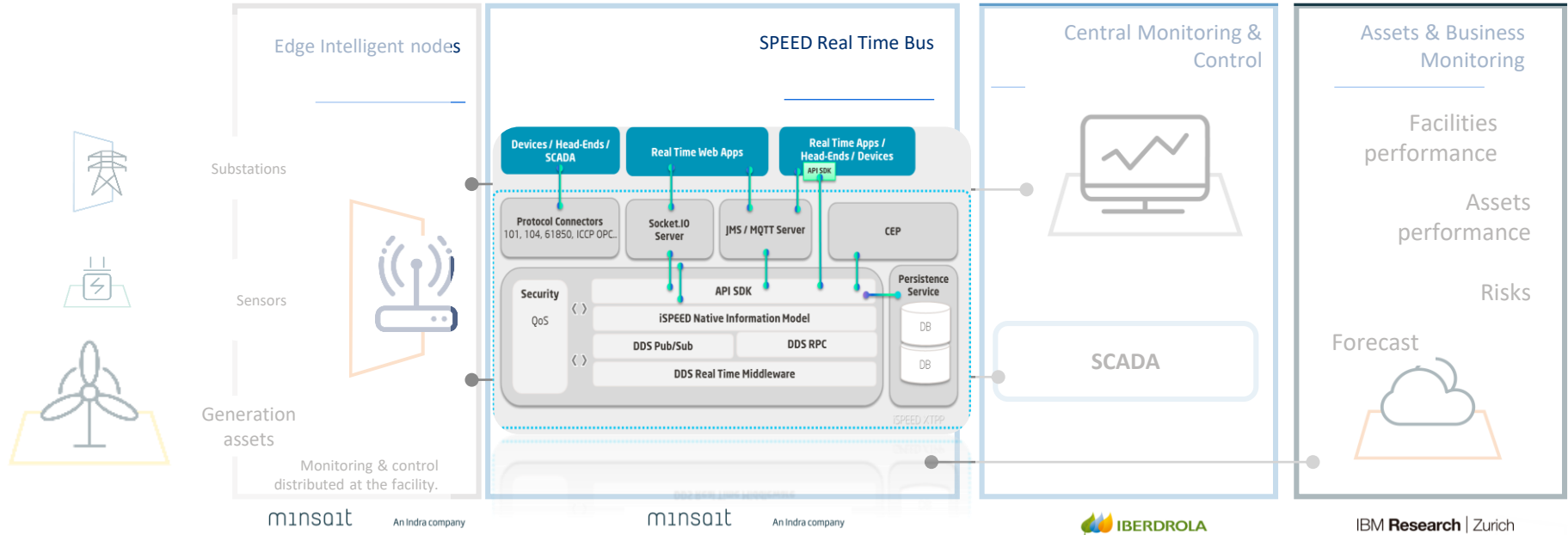
For devices, local & central Scadas and other monitoring systems.

Broad Connectivity

API, IEC 104, 102, OPC-UA, OPC-DA, Modbus, DNP3, MQTT



RT Common Data Space



Publish / Subscribe
Request / Reply

Secure & reliable
communication

Hyperfast data
transmission



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ROMEO

Onesait: our ecosystem of digital products supporting and enabling the transformation of our customers



Accelerating the transformation of your business through our own products

Our products enable the digital transition with the required agility and a results oriented approach



We undertake a vision of the future for your sector

Our products anticipate your needs and address highly competitive scenarios



Embracing and integrating cutting edge technology

Because being the first is as important as being the best, a strong foundation is essential



Innovating in an open ecosystem

We foster the co-creation of new businesses and products build with a community-based innovation approach

An ecosystem of digital products that leverages the impact we have been generating in our customers for more than 25 years

+100.000

companies are connected with our solutions

+500M

persons receive services managed by our solutions.

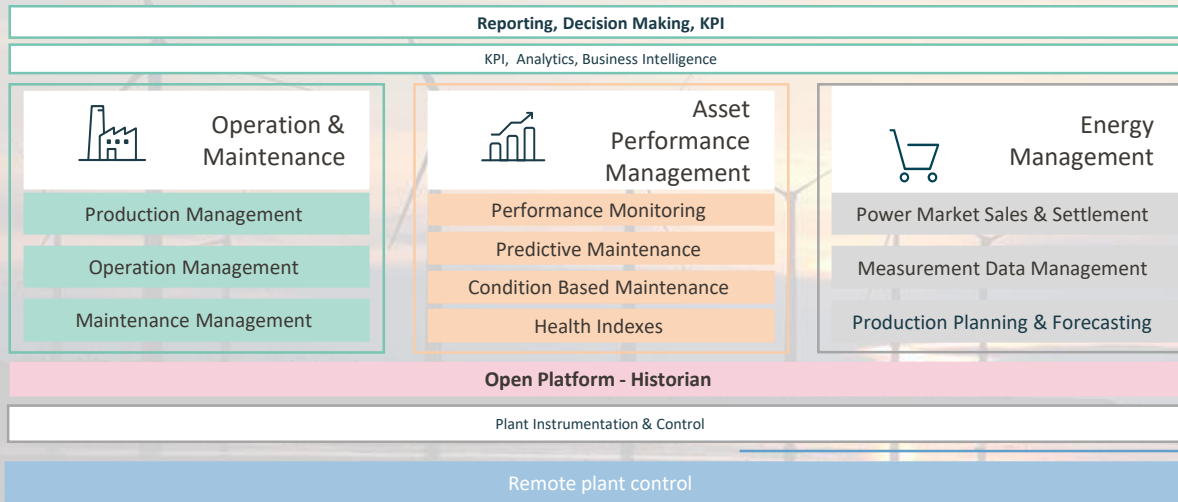
+45

countries where our solutions operate..

12

industries where our solutions provide value.

Minsait is currently supporting operation and management of more than 140 wind farms



Wind farms Edge Management

integration, management and communications.

Redundant SCADAs for renewable operation

Real Time Monitoring and control
Alarms and portfolio monitoring.
Communications management

Delegated Dispatch center & AGC

Administration and management of renewable facilities .

Assets, facilities communications, outages, maintenance , reports, configurations.

Wind Assets Performance Management



+142
Renewable generation
facilities managed



+1 Million signals
Managed in real time



24 x 7
Support with 20+
professionals



+10 years
Supporting renewable
management

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Thank you!

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