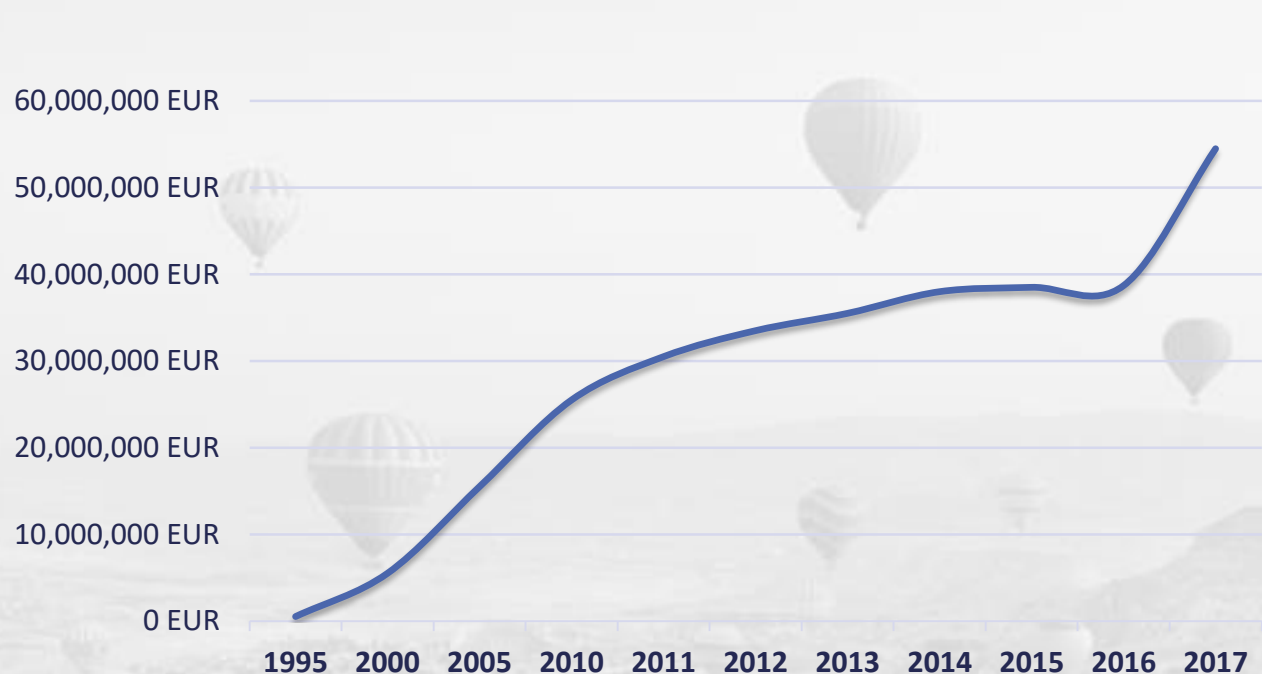# Utilities 4.0 – The new Generation of SCADA Systems

Tradition meets Innovation

April, 2019

Background

- European group of companies dedicated to the Transport and Distribution (T&D) Market

- Manufacturing Low, Medium and High Voltage equipment

- Recently launched its 4th generation (IoT) SCADA

- Experienced team for deployment, commissioning and consulting for:

  - Data analytics applications (e.g. Osisoft PI)

  - SCADA EMS/DMS systems

  - Wind and photovoltaic parks

  - Smart Metering

  - Cogeneration and MicroGrids

At a glance

- 60,000,000 EUR
- 50,000,000 EUR
- 40,000,000 EUR
- 30,000,000 EUR
- 20,000,000 EUR
- 10,000,000 EUR
- 0 EUR

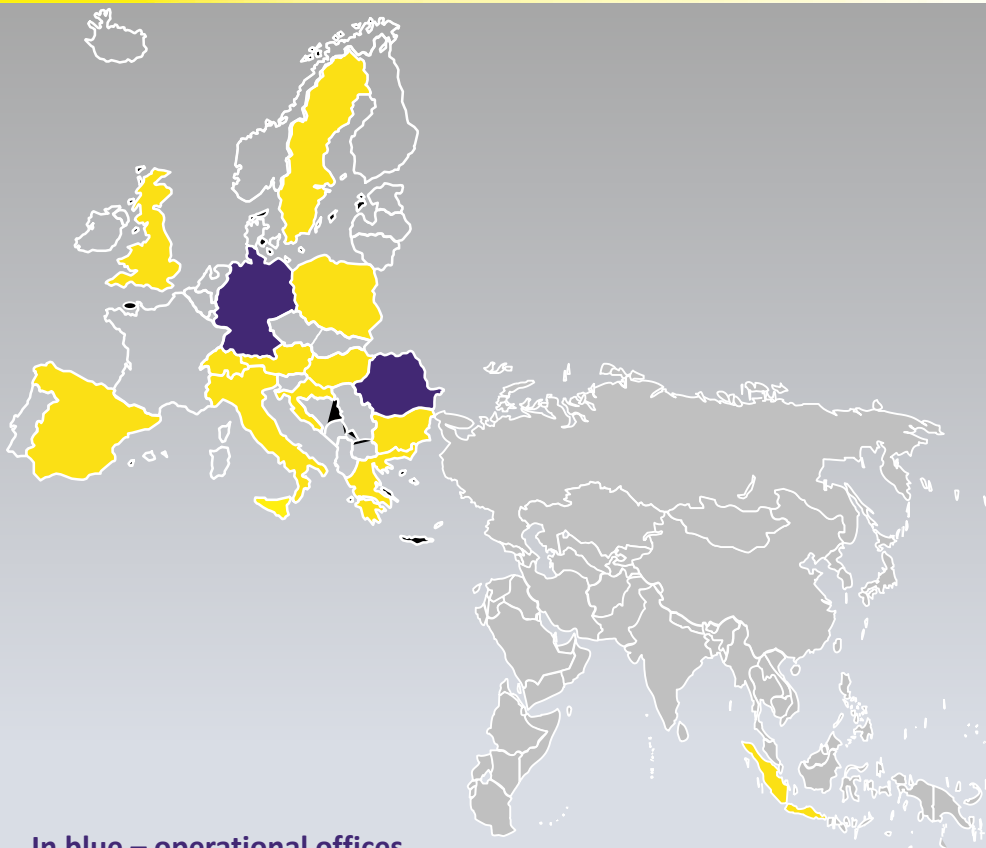1995 2000 2005 2010 2011 2012 2013 2014 2015 2016 2017

25
years of experience

450 +
employees

300 +
T&D products

250 +
EPC, Consulting and Electrical Design Projects

25 +
patented inventions

*consolidated for the Energy T&D Market for Eximprod Grup, Eximprod Power Systems, Inovium Digital Vision and Total Electric Automatizari

Presence in Europe and Asia

GERMANY - 24 kV station post & railway insulators

ITALY - Medium Voltage Products and Equipment (ENEL International)

POLAND – Medium Voltage Fuses, Insulators

SWEDEN - 24 kV station post insulators

SWITZERLAND - 25 kV railway insulators
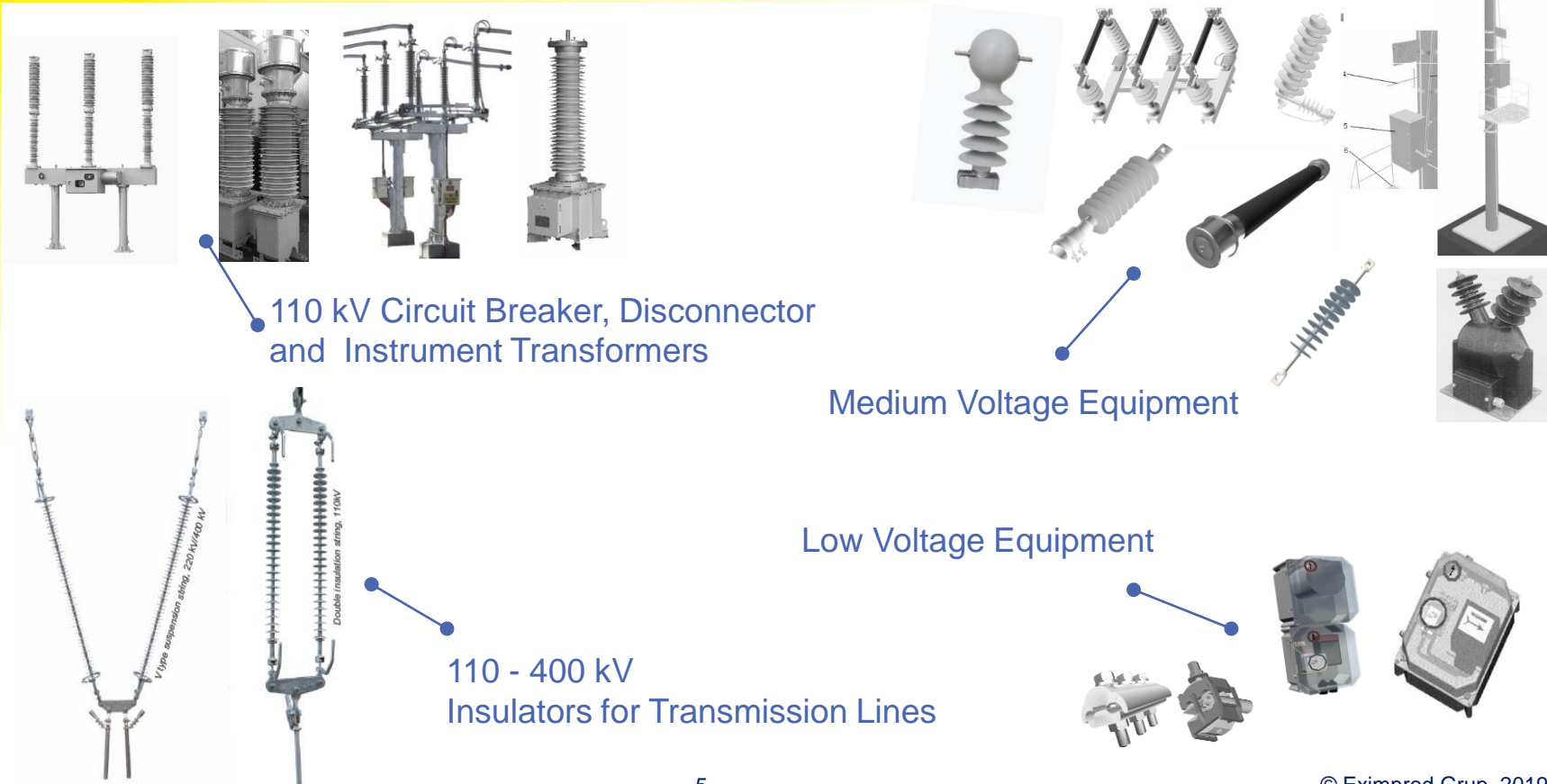
NETHERLANDS – Outdoor sensors for current and voltage

BULGARIA - 25 kV railway insulators and Medium Voltage Fuses

INDONESIA - Medium Voltage Fuses

In blue – operational offices

Eximprod T&D product highlights

110 kV Circuit Breaker, Disconnector and Instrument Transformers

Medium Voltage Equipment

Low Voltage Equipment

110 - 400 kV
Insulators for Transmission Lines

Major clients in T&D and Renewables

SCADA/IoT and Software Development Team

Eximprod IT, OT and IoT

- Business Unit founded in 2005;

- Consolidated Turnover in 2017: +94.000.000 RON

- Headquarter: Bucharest, Romania; Engineering branches: Iasi, Bacau, Buzau;

- Main Projects & Reference Highlights:

Dispatch Center for DSO, Renewable Energies

SCADA DMS Systems, Substations (+200),
Secondary Dist (+1000),
MV switches and reclosers (+4000)

Electric Design

Cogeneration Plant Dispatch

Consulting Services

EPC for wind HV/MV Electrical Substation and Grid Connection

Experience in multi-vendor environments

| IEDs and Protection Relays from:	RTU/PLC/DCS/IT-OT Systems from:	Communication Protocols

IEDs and Protection Relays from:

SIEMENS
ABB
efacec
Schneider Electric
AREVA
SEL SCHWEITZER ENGINEERING LABORATORIES
NOJA POWER
TEL TAVRIDA ELECTRIC
VAMP Protection relays
HAWKER SIDDELEY SWITCHGEAR a BRUSH company
Microelettrica Scientifica

RTU/PLC/DCS/IT-OT Systems from:

efacec
EPG EXIMPROD GRUP
SIEMENS
ABB
VIOLA systems
OSIsoft.
PHŒNIX CONTACT
EAT·N
Schneider Electric
TELVENT
MOXA
ICP DAS
skytron pioneers of energy
Honeywell
Janitza electronics
GE

Communication Protocols

IEC 60870-5-101 / 104
IEC 61850
Modbus TCP/serial
DNP 3.0
IEC 60870-5-103
SPAbus
OPC
Profibus
Proprietary protocols

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Eximprod in the Smart Grid Market

- Extensive High, Medium and Low Voltage equipment portfolio, including combined Current and Voltage Sensors for MV networks;

- State of the Art 4th generation IoT SCADA platform software development;

- Experienced Team for deployment, commissioning and consulting for :

  - Data analytics applications (e.g Osisoft PI);

  - SCADA EMS/DMS systems;

  - Wind and photovoltaic parks;

  - Smart Metering;

  - Smart Lighting;

  - Water treatment;

  - Cogeneration and MicroGrids;

Preferred Solution Partner

Advanced Partner
Substation Automation SIEMENS
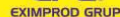
Cooperation with CISCO

Current areas of partnership

- State of the Art 4th generation IoT SCADA platform software development;

- Complex LoRaWAN software development for Utilities and Oil&Gas;

- Industrial Switch and Routers for Energy Utilities;

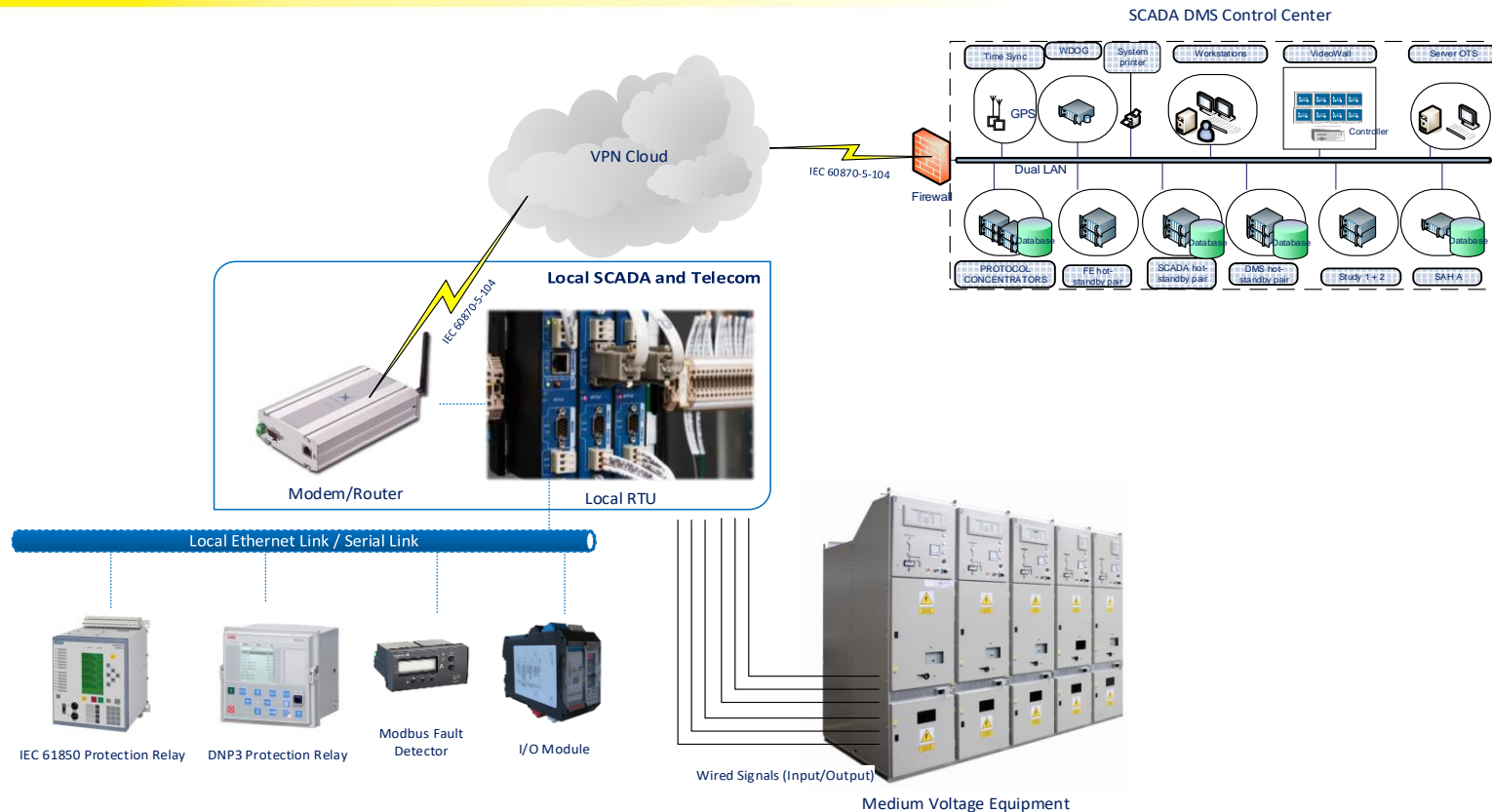- SCADA DMS/EMS Cybersecurity;

A Smart New World

Current SCADA Environment

- Multiple vendors and equipment of various age in the installation

- Software embedded on specific hardware

- Dedicated Hardware for each function

- Software solutions depended on vendors

- Low Security on existing equipment/protocols

- Difficult/manual updates

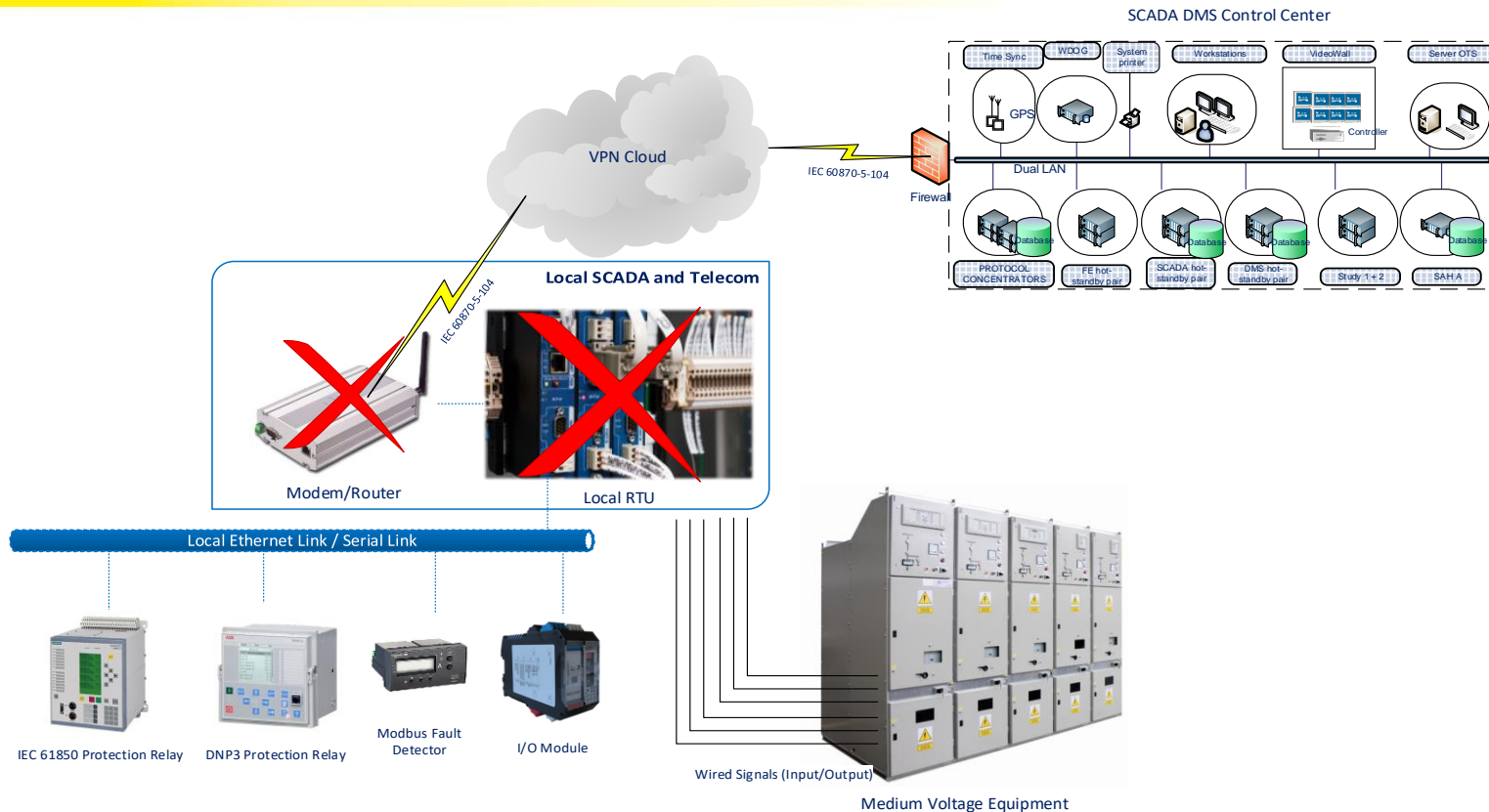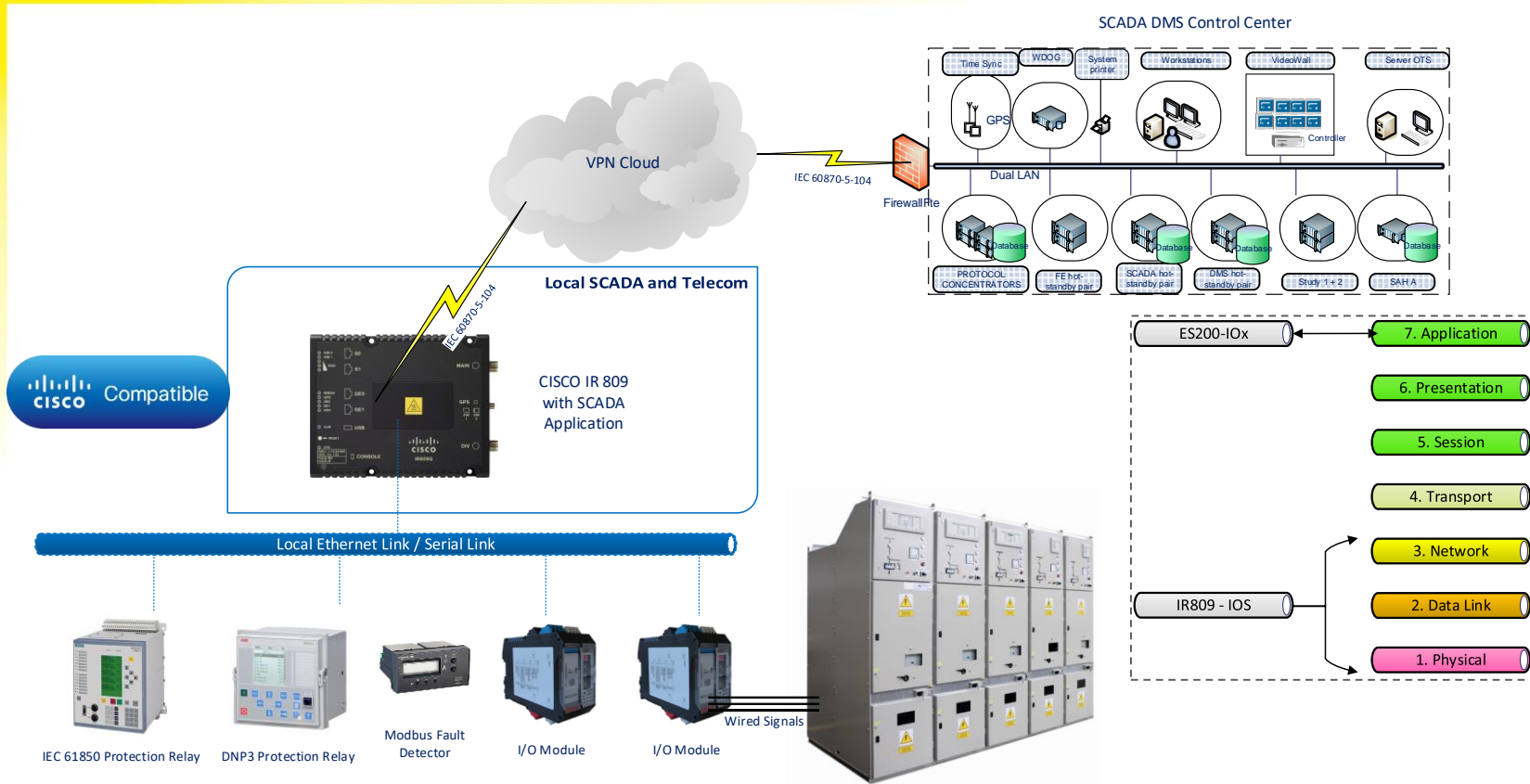- Long Life Span for equipment – over 10 years

Standard Distribution Automation

SCADA DMS Control Center

Time Sync | WDOG | System printer | Workstations | VideoWall | Server OTS

GPS

Controller

Dual LAN

Firewall

IEC 60870-5-104

PROTOCOL CONCENTRATORS | FE hot-standby pair | SCADA hot-standby pair | DMS hot-standby pair | Study 1 + 2 | SAH A

Database

VPN Cloud

IEC 60870-5-104

Local SCADA and Telecom

Modem/Router

Local RTU

Local Ethernet Link / Serial Link

IEC 61850 Protection Relay

DNP3 Protection Relay

Modbus Fault Detector

I/O Module

Wired Signals (Input/Output)

Medium Voltage Equipment

Standard Distribution Automation(2)

SCADA DMS Control Center

VPN Cloud

IEC 60870-5-104

Firewall

Time Sync · WDO G · System printer · Workstations · VideoWall · Server OTS

GPS

Controller

Dual LAN

PROTOCOL CONCENTRATORS · Database · FE hot-standby pair · SCADA hot-standby pair · Database · DMS hot-standby pair · Database · Study 1 + 2 · SAH A · Database

Local SCADA and Telecom

IEC 60870-5-104

Modem/Router

Local RTU

Local Ethernet Link / Serial Link

IEC 61850 Protection Relay

DNP3 Protection Relay

Modbus Fault Detector

I/O Module

Wired Signals (Input/Output)

Medium Voltage Equipment

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Our Digital Approach

SCADA DMS Control Center

Time Sync | WDOG | System printer | Workstations | VideoWall | Server OTS

GPS

Controller

Dual LAN

IEC 60870-5-104

Firewall Rte

VPN Cloud

PROTOCOL CONCENTRATORS | FE hot-standby pair | SCADA hot-standby pair | DMS hot-standby pair | Study 1 + 2 | SAH A

Database

IEC 60870-5-104

Local SCADA and Telecom

CISCO IR 809 with SCADA Application

CISCO Compatible

MAIN

GPS

CONSOLE

CISCO

DIV

ES200-IOx

7. Application

6. Presentation

5. Session

4. Transport

3. Network

IR809 - IOS

2. Data Link

1. Physical

Local Ethernet Link / Serial Link

IEC 61850 Protection Relay | DNP3 Protection Relay | Modbus Fault Detector | I/O Module | I/O Module

Wired Signals

Medium Voltage Equipment

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CISCO Preferred Solution Partner

ES200 – A new perspective

- Upgrade instead of Replace

- Software Defined Infrastructure in OT

- State of the art CISCO Security for SCADA

- Versatility - new functions available on a single device with multiple 3rd party apps

- Less hardware deployed (2-in-1 solution);

- Zero-touch installation and update management with FogDirector

- Multipoint data delivery

ES200 Multi-purpose Use case
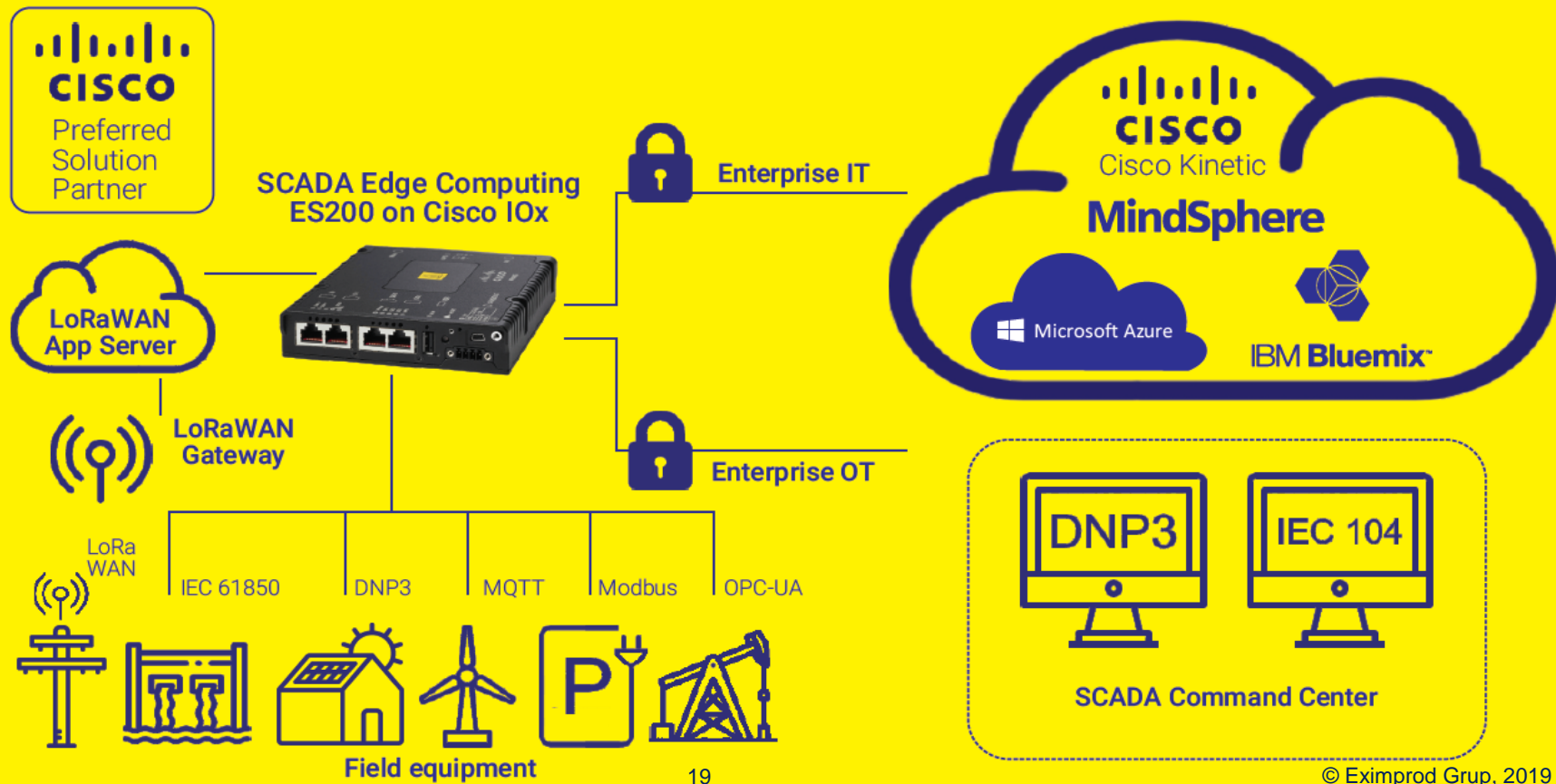
ES200 Fog Director Integration

ES200 runs integrated with the Cisco Fog Director environment which allows state of the art manageability and integration with 3rd party Applications

ES200 Reference Highlight

- Main ES200 End-Users

electrica s.a.	Main Distribution System Operator in Romania. ES200 deployed on Cisco IR809 since 2017 , using Field Network Director and Fog Director for Distribution Automation management
e·on	Adopted ES200 in Cisco IR 809 in 2018. 47 secondary substations du to be commissioned until January 2019.
monsson	Main private dispatching center for Renewables in Romania. ES200 is deployed to manage different local configurations, including OPC UA communication

- Ongoing PoC in : Latvia, Germany, Norway.

- Detailed Reference list is attached

CISCO
Preferred
Solution
Partner

Cooperation with Siemens

Current areas of partnership

- Cooperation with Siemens in the SCADA field started in 2008 by suppling the Siemens Spectrum 4.6 SCADA EMS/DMS platform for E.ON Romania;

- Eximprod is Siemens Advanced Partner since 2012, when the program had been launched in Central and Eastern Europe;

- Eximprod and Siemens have a strong cooperation background in the High Voltage, Medium Voltage and SCADA areas;

- Eximprod is extending the current cooperation into the IoT/Industry – Mindsphere app to be launched soon;

- Eximprod is entering the MV sensors market along with Siemens – OEM manufacturing
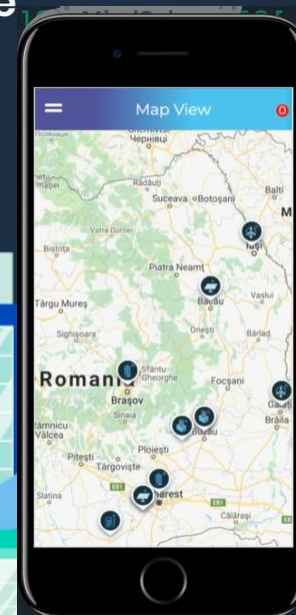
Siemens Cooperation Highlights

- Cooperation with Siemens in manufacturing FCM OEM for Eximprod

- First unit ready for shipping in apr-may 2019

Siemens Cooperation Highlights

EPG Intelligent Facilities on Mindsphere

https://inovium.ro/mindsphere_BMS/bms-video14-final.mp4

Advanced Partner
Substation Automation
SIEMENS

Conclusions

- SCADA Systems are data sources to drive Business Value

- Security is foundational for SCADA

- New technologies enable new use-cases

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Advanced Partner

Substation Automation   SIEMENS