

Use of IEC-61850 to telecontrol MV grids

PAC World Conference

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Presentation

- Fine control of the distribution grid
- Homogenous telecontrol system
- MV control → high volume of facilities
- We present standard solutions with:
 - Standard protocols
 - Future-proofed
 - Low cost
 - Communications Media independent

Contents

Control over
MV grid

Considerations

Tools

Cases

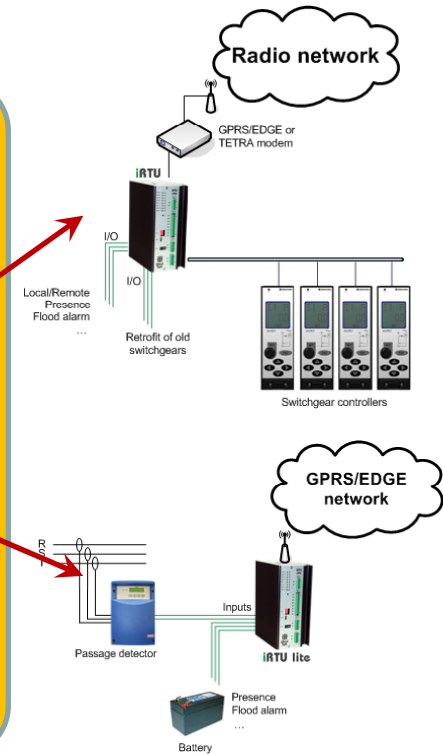
Solutions

SAIDI
Renewables

Low cost
Communications
Robustness
Future-proof

IP
networks
IEC 61850

Remote
switchgears
Fault
detection



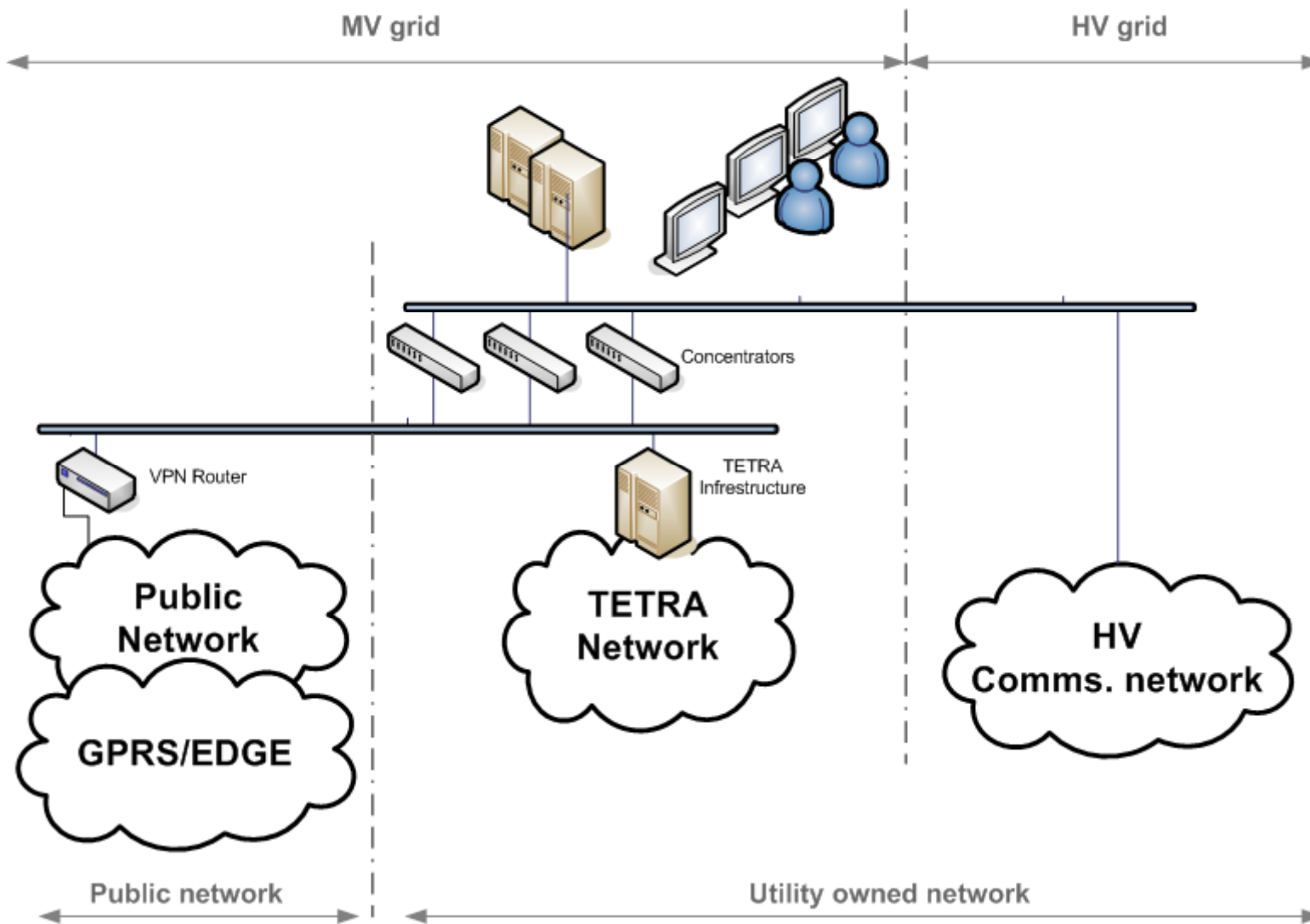
MV telecontrol considerations

- Low Cost: Equipment, commissioning and communications
- Communications media independent
- Off-the-shelf products
- Future-proof
- Robustness: EMC + temperature and humidity.

The communications media

- TCP/IP networks
 - Integration of private and public networks.
 - Media independent
- Today networks for MV telecontrol
 - Private networks (TETRA, xDSL, ...)
 - Investment required.
 - Secure communications.
 - Public networks (GPRS, Wimax, ...)
 - Cost effective solution.
 - Suited for non-critical points.

The communications media



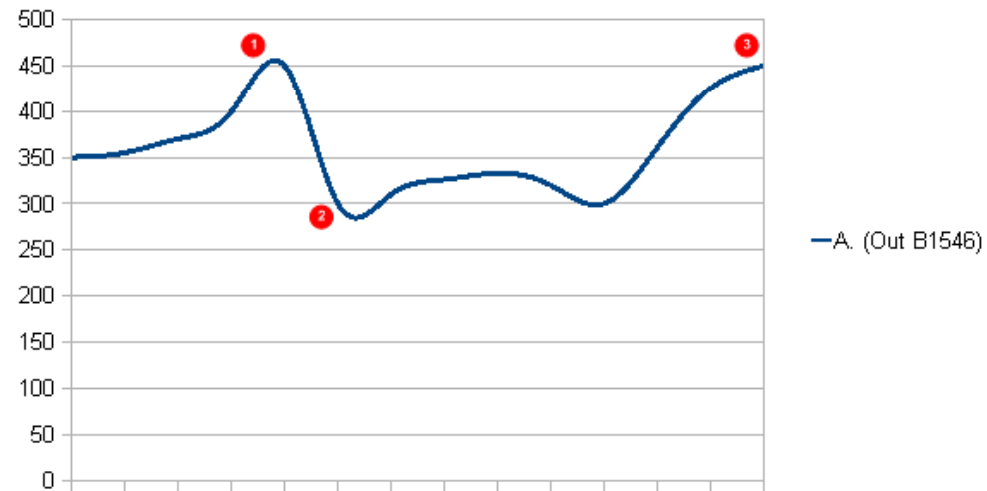
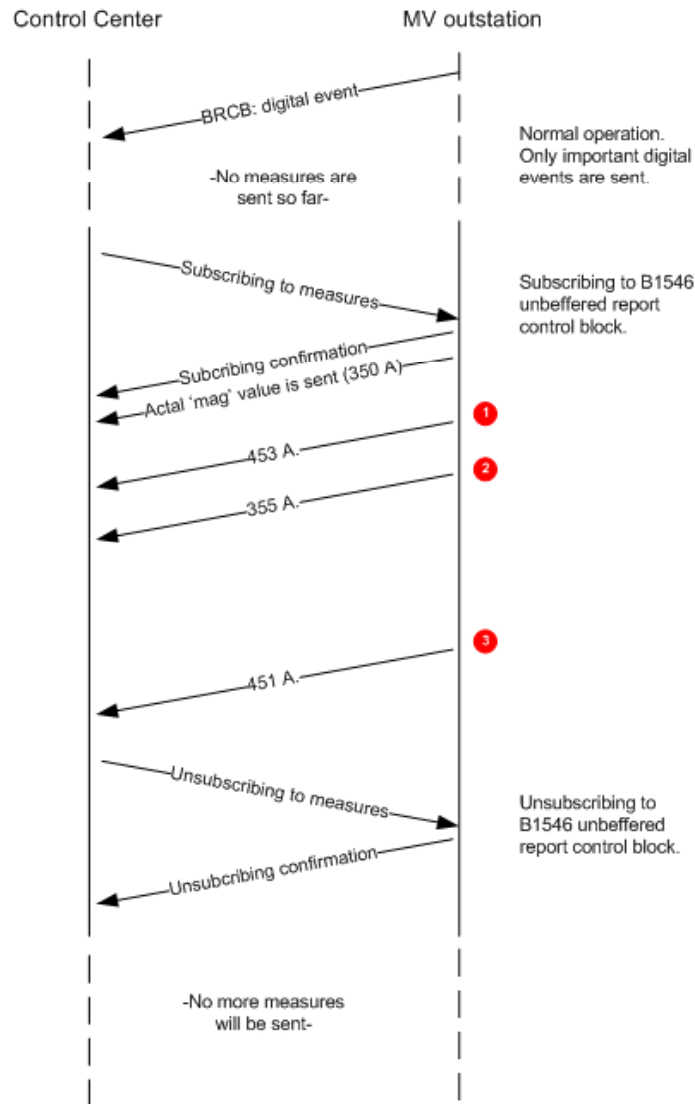
Why IEC-61850?

- Protective devices available to all applications
- More functionalities
- Generic widely available technology
- Share common: protocol, data format, naming, configuration.
- Easy and secure deployment (configure and commissioning)
- Low traffic
- Future

Case A - Remote Control of MV switchgears

- Use of MMS/61850
- Objects discovering reduces the chance of configuration errors during commissioning.
- Much other information for engineering applications.
- Events submitted using Buffered Report Control Blocks (BRCB).
- Measurements submitted using Unbuffered Report Control Blocks (URCB).

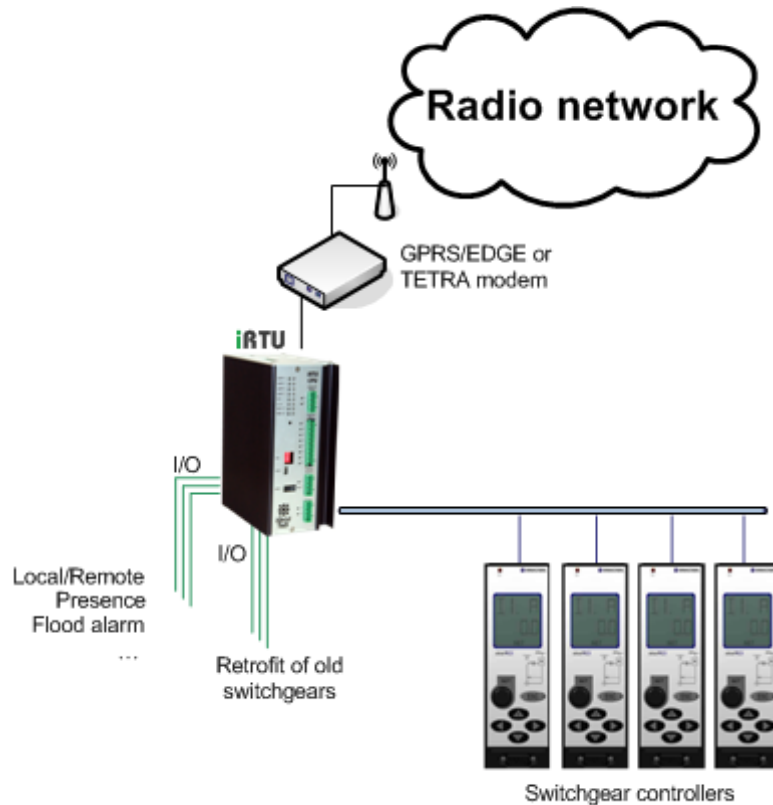
Case A - Measurements



Case A – Today's handicaps

- Many facilities require retrofit
- 61850 equipment more expensive than conventional
- Control center connected to all IEDs?

Case A - Solution

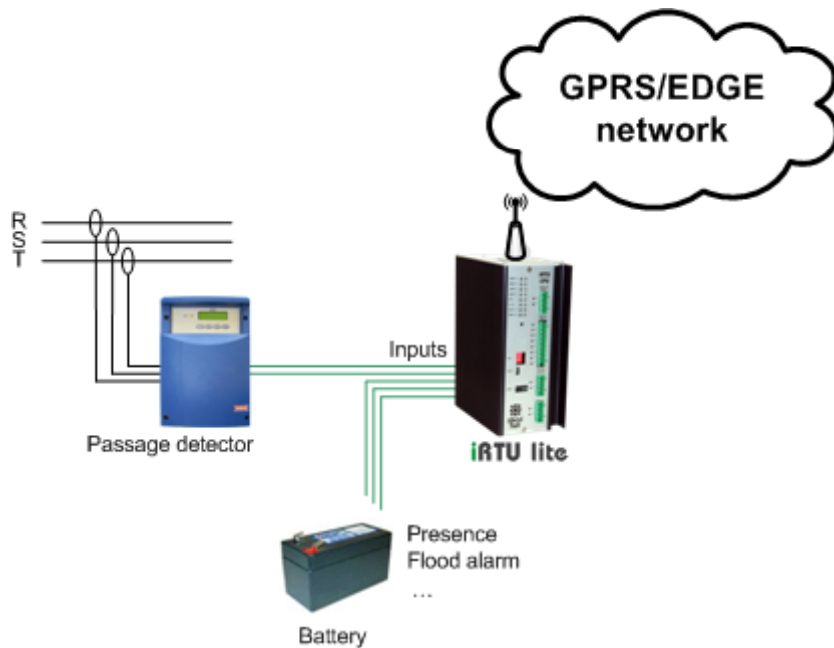


- intelligent RTU (iRTU)
- Low cost
- I/O for retrofit
- Communications integration
- All-in-one

Case B - Over-current fault detection

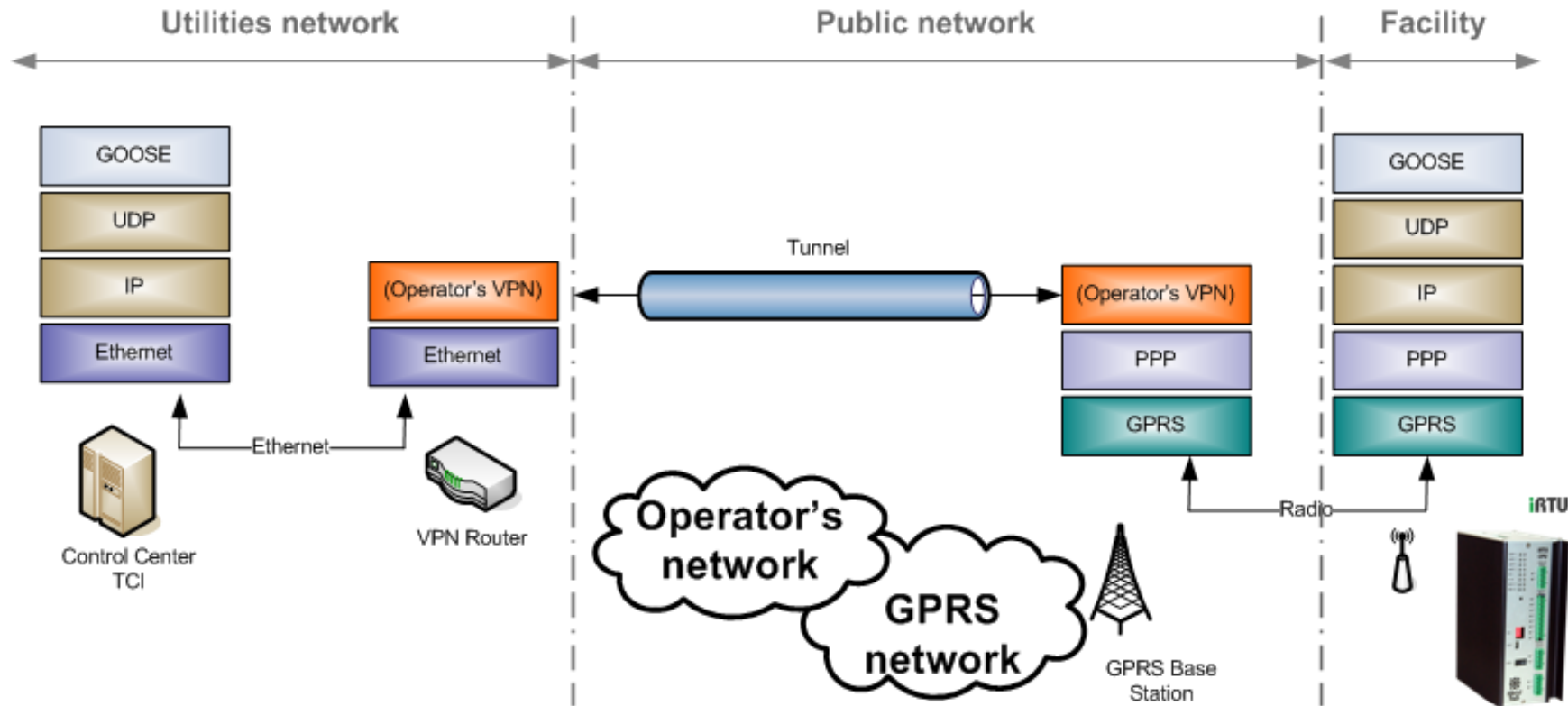
- Performing fault detection requires using specific devices that can detect over-current conditions.
- When a fault occurs the sensors will report this event to the Control Centre through a small RTU.
- The fault detectors allow the Control Centre to isolate the affected area very quickly.

Case B - Solution



- intelligent RTU (iRTU Lite)
- Low cost
- 8 digital inputs
- Internal GPRS/EDGE modem
- GOOSE reports

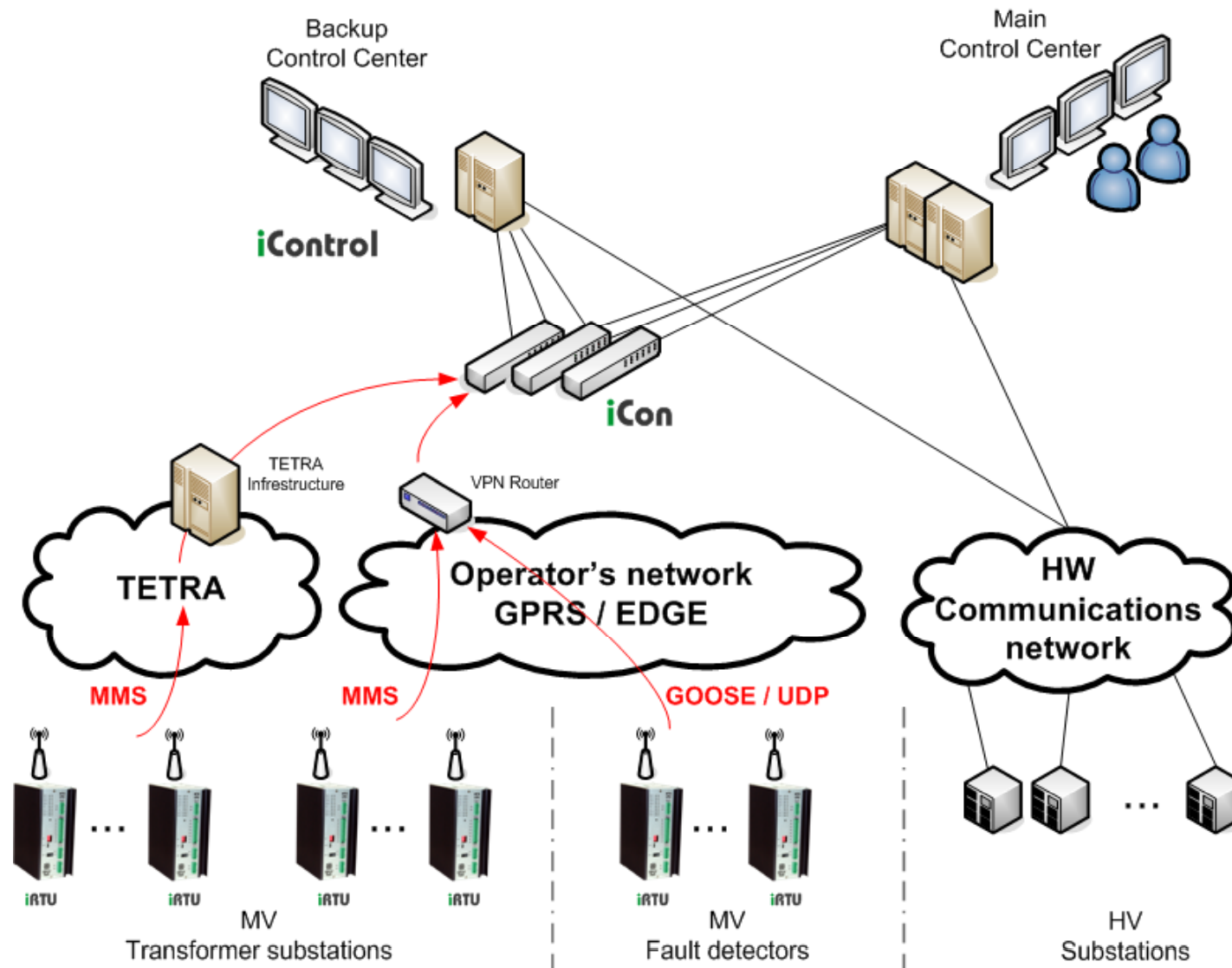
Case B - Protocol stack used



Data concentrators

- MV telecontrol means many concurrent connections.
- The Control Centre must be freed from the communications management and pass to it only relevant information.
- With a hot-standby configuration.
- Translation to current Control Center protocol (DNP3, 101 or 104).
- A GOOSE concentrator can handle a high volume of fault detectors.

Data concentrators



Conclusions

- Remote control of the MV grid allows faster correction of faults.
- Use of advanced RTUs integrate reliable and secure data communication using IP networks.
- Found two scenarios solved with two optimal solutions based on IEC-61850 standard.
- Solutions based on standard protocols and providing forward path compatibility.
- Take advantage of IEC-61850 benefits to use it in WAN networks.

Thanks



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