The future of PROFIBUS & PROFINET technology

UK Conference, June 23rd 2015

Xaver Schmidt
Where are we today?

Over 50 Million!

Now 10 Million!
New buzz words in our industry?

Industrie 4.0 vs. Industrial Internet

Industrial Ethernet vs. IIoT

IoT
Industrial Internet of Things – Typical Use Cases

Typical Use Cases

Remote Access

Cloud

Big Data

Do they sound familiar?

Quelle: Siemens AG
## IoT vs. IIoT

<table>
<thead>
<tr>
<th>IoT</th>
<th>IIoT</th>
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<tbody>
<tr>
<td><strong>Revolution</strong></td>
<td><strong>Evolution</strong></td>
</tr>
<tr>
<td>New</td>
<td>Existing</td>
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<tr>
<td>• Devices</td>
<td>• Devices</td>
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<tr>
<td>• Standards</td>
<td>• Standards</td>
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<tr>
<td><strong>Things</strong></td>
<td><strong>Data</strong></td>
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<tr>
<td>Lots of data</td>
<td>Tons of data</td>
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<tr>
<td><strong>Ad hoc connectivity</strong></td>
<td><strong>Structured connectivity</strong></td>
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<tr>
<td>User serviced</td>
<td>User + OEM + Vendor serviced</td>
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<tr>
<td>Important –but not critical</td>
<td>Mission critical</td>
</tr>
<tr>
<td></td>
<td>• Analytics</td>
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<tr>
<td></td>
<td>• Security</td>
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<td>• Data integrity</td>
</tr>
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<td>• Response times</td>
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The road to IIoT

- Evolution
- Existing devices
- Legacy data access
Non-Ethernet devices

Data from Ethernet and legacy networks

Industrial Ethernet network (PROFINET)

Legacy fieldbus network (PROFIBUS)
Ethernet is Key
There will be more than one protocol!

Domain specific data transfer (Realtime, Safety, …)

Internet Communication
Grain Management
- Temp & moisture sensors collect data from stored grain

Hazard Monitoring
- Temp & motion sensors monitor grain elevators

Why PROFINET?
- Uptime!
- Real-Time!
Communication Networks

Corporate IT
Central data backbones

Production Network

Production Network

Production Network
Communication Networks

Corporate

Central Data Backbones

Production Network

Production

Production Network

Production Network

Field
Powerful Networks

Corporate

Production

Field

Bandwidth
Realtime
Usability
New Requirements

Cloud
Energy-management
Condition Monitoring
Example: Central Maintenance

- Requires bi-directional communication
- Requires access down to the field level
- Secure access needs to be ensured
- Transparent connection between networks
Self-configuring / Dynamic Networks

Machine Builder

Delivers machine with automation solution and network configuration

Plant Operator

Integrates machine in plant → requires changes in network configuration

Automation and network configuration intrinsically tied together today
Separation of Automation and Network

Automation and Network Configuration must be separate in the future.

Machine Builder:
- **Automation**

Plant Operator:
- **Operation**

Test independent of network configuration:
- No IT-Services
- Commissioning with temporary configuration

Integration in existing network:
- Individual requirements of local IT

Doesn’t want to deal with IP-Addresses

Simply wants to connect the machines
Future Requirements

New Applications demand higher Bandwidth
- PROFINET is scalable to higher bandwidth
- IP-based communication will push more in the field level
  - Multiple protocols in parallel to deterministic, cyclic I/O
  - OPC UA as a standard on higher levels

But Industrial Communication should not become more complex!
PROFINET is the right basis for Industry 4.0

**Energy Management**
- One cable for all purposes
- Easy cabling

**Condition Monitoring**
- Fast device replacement
- Ruggedness/stability
- Performancc

**Safety**
- Web tools
- Flexible topologies
- Performance

**Diagnostics**
- Industrial Wireless LAN
- High transmission rate
- Fast start-up
- Media redundancy

**Security**
- Real time communication
- Large quantity structures
- Efficiency

PROFINET addresses each of these imperatives
Thank You!

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