The Future of Industrial Internet
Networking and Connectivity

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The IIC: Things are coming together

Academia
Research
Systems Integration
Government
Connectivity
Security
Standards
Industries
Big Data

The IIC: Things are coming together.
What is the Biggest Challenge Facing the Industrial Internet?

- Interoperability: IIC Technology Working Group
- Security: IIC Security Working Group
- Connectivity Issues: IIC Testbeds Working Group
- Other: IIC Marketing and Business Strategies & Solution Lifecycle Working Groups
Industrial Internet of Things Reference Architecture

- **Informative**
  - Descriptive
  - Understanding
  - Non-technical
  - General
  - Broad audience

- **Whitepaper**
  - Build consensus on key architecture concepts & models
  - Raise awareness on important concerns
  - Provide high-level guidance on how to address these concerns
  - Present important ideas correctly and clearly
  - Accessible and useful to technical generalists

- **Technical Report**

- **Specification**

- **IIRA**

- **Normative**
  - Prescriptive
  - Compliance
  - Technical
  - Specific
  - Technical audience
Industrial Internet Reference Architecture
Moxa’s Role in the Edge Tier

Connectivity
Edge Connectivity in the IIoT

**Application**
- Cloud Infrastructure
- Data Processing & Analytics
- Enterprise Applications

**Industrial Applications**
- Smart Grid, Transportation...

**Connectivity**
- Access Network
  - Enables data flow between Connectivity and Application layer

- Proximity Network
  - Enables data flow from edge devices to Connectivity layer e.g., Control/SCADA systems

**Device**
- Smart / Legacy Components
  - Sensors/Actuators/Processors/Data Storage/Control/Embedded OS/Software

**Proximity Network**

**Access Network**

**Device Management & Data Aggregation**

**Service Platform**
- Data Flow
- Control Flow

**Domain Applications**
- Operations

**Service Network**
- Data Flow
- Control Flow

**Edge Gateway**
- Edge Connectivity in the IIoT

**Platform Tier**

**Edge Tier**

**Enterprise Tier**
Industrial Internet of Things

Industrial IoT Layer

Application

Industrial Applications
(Smart Grid, Transportation…)

Cloud Infrastructure

Data Processing & Analytics

Enterprise Applications

Connectivity

Access Network
Enables data flow between Connectivity and Application layer

Proximity Network
Enables data flow from edge devices to Connectivity layer e.g. Control/SCADA systems

Device

Smart / Legacy Components
Sensors/Actuators/Processors/Data Storages/Control/Embedded OS/Software
IoT Application Pattern + Edge
Primary IIoT Architectures

Edge to Cloud

Analytics
Cloud Infrastructure
SCADA
Edge Gateways
Devices & Sensors
Primary IIoT Architectures

Edge to Cloud

- Cloud Infrastructure
- Analytics
- SCADA
- Edge Gateways
- Devices & Sensors
- Microsoft Azure
- AWS
- Alibaba Cloud

Edge to Modern SCADA

- Cloud Infrastructure
- Analytics
- SCADA
- Edge Gateways
- Devices & Sensors
- Microsoft Azure
- AWS
- Alibaba Cloud
- Online SCADA
- MQTT
- Publish / Subscribe
- AMQP
- Modbus
- PROFINET®
- EtherCAT
- EtherNet/IP
Primary IIoT Architectures

- **Edge to Cloud**
  - Cloud Infrastructure
  - SCADA
  - Edge Gateways
  - Devices & Sensors
  - Analytics
  - Online SCADA
  - Publish / Subscribe
  - AMQP
  - MQTT
  - Modbus
  - PROFINET
  - EtherCAT
  - PROFINET

- **Edge to Modern SCADA**
  - Cloud Infrastructure
  - SCADA
  - Edge Gateways
  - Devices & Sensors
  - Analytics
  - Online SCADA
  - Publish / Subscribe
  - AMQP
  - MQTT
  - Modbus
  - PROFINET
  - EtherCAT
  - PROFINET

- **Edge to Traditional SCADA**
  - Cloud Infrastructure
  - SCADA
  - Edge Gateways
  - Devices & Sensors
  - Analytics
  - Online SCADA
  - Publish / Subscribe
  - AMQP
  - MQTT
  - Modbus
  - PROFINET
  - EtherCAT
  - PROFINET
Example of Azure IoT Edge Certified Hardware

Moxa IIoT Edge Gateways: ARM or x-86 with 10-year support for Linux
Industrial IoT Ecosystem

- Analytics
- Cloud Infrastructure
- SCADA
- Edge Gateways
- Devices & Sensors

Cloud Providers:
- Microsoft Azure
- AWS
- Aliyun

Scalable Communication Protocols:
- MQTT
- AMQP

Device Standards:
- Modbus
- PROFINET
- EtherCAT
- PROFINET
- EtherCAT
- PROFINET
- EtherCAT
IT/OT Convergence at the Cloud

Alibaba’s IT and Cloud Expertise

Moxa’s OT and Industrial Expertise

- Analytics
- Cloud Infrastructure
- Edge Gateways
- SCADA
- Devices & Sensors
IloT Ready Industrial Connectivity

Accelerate Your IloT Applications

- ThingsPro IloT Web Interface
- Next Generation x86 Systems
- Linux IloT Edge Gateways

Smart Factory
Smart Transportation
Smart Power
Smart Oil & Gas