CT439 - Data Management and Reporting Made Simple
Agenda

Connected Enterprise 101
Detecting & Collection Simplified
Visualize
Scalable Compute
NEW Analytics Solutions
Bringing The Connected Enterprise to Life
Purdue Reference Architecture

Level 4 - ERP
Business Planning & Logistics
Production Scheduling, Operational Management, Resource Planning, etc.

Level 3 - MES
Manufacturing Operation & Control
Dispatch Production, Detail Production, Scheduling, Asset Management, etc.

Level 2, 1, 0 – Control, I/O, Devices
Batch Control
Continuous Control
Discrete Control

WAN
Executive Finance
Operations Quality IT

LAN
Engineering Maintenance Purchasing

Control Networks
Manufacturing Control Disciplines
Multiple Control Disciplines
Control System Evolution

- Controller / I/O
- SERCOS / IRT
- DNET / RT
- ENET
- HMI
- Switch
- Motion Control
- Distributed I/O
- Safety Relay
- Freq Drive
- Power Monitoring
- Integrated Condition Monitoring
- Distributed I/O
- Safety Relay
- Safety System
- Drive
Control System Evolution
IIoT for Manufacturing Systems

Level 5 - Cloud
Cloud
Consumer, Social, Serialization, Mobility, Analytics,........

Level 3 - MES
Manufacturing
Operation & Control
Dispatch Production, Detail Production, Scheduling, Asset Management, etc.

Level 1 – Smart Devices
I/O & Devices
Sensors, Power, Instrumentation, Controls

Level 4 - ERP
Business Planning & Logistics
Production Scheduling, Operational Management, Resource Planning, etc.

Level 2 - Control
Manufacturing
Control Systems
Batch, Continuous, Discrete HMI, Alarming, Trending, Asset Mgmt

Level 0 – Physical
Physical Plant
Equipment
Journey to a Connected Enterprise
People, Processes and Technologies

CONNECT
- Connect plant equipment & people
- Use available, standard technologies
- Must be scalable and flexible
- Do it securely

EVALUATE
- What data is needed, from which assets, and define how it helps
- Ensure the assets are able to provide the information need

COLLECT
- Date from assets and organize to improve business processes
- Leverage information from across the plant and enterprise

PRESENT
- Contextualize it against other data
- Make it actionable & to make smarter decisions
- Put it in terminology that’s right for the user

OPTIMIZE
- Correlation & qualitative analysis of the information for process improvement
- Maximize plant workflow in a coordinated way
- Make the plant integral to B2B partners

Detect Digitize Analyze Action

Defines Analytics
Four Types of Analytics Capability

- **System**: Descriptive
  - What happened?

- **System**: Diagnostic
  - Why did it happen?

- **System**: Predictive
  - What will happen?

- **System**: Prescriptive
  - What should I do?

**Decision Automation**

**Decision Support**

**FEEDBACK**

Source: Gartner
Evolving Capabilities

**Scalable Analytics**

**ENTERPRISE**
- Which plant performed the best?
- Why is Site A throughput below plan?
- Will I meet plan today? Tomorrow?
- How can I change operations to improve Profitability? Yield? Quality?

**SYSTEM**
- Is the system running ok?
- Why is Line 1 quality affected?
- Will the process be stable?
- How do I adjust to maintain/improve process stability?

**DEVICE**
- Am I running ok?
- What is happening?
- What’s the likely next device state? When will it occur?
- What maintenance action is required? When?

**DESCRIPTION**
**DIAGNOSTIC**
**PREDICTIVE**
**PRESCRIPTIVE**
Agenda

- Connected Enterprise 101
- Detecting & Collection Simplified
- Visualize
- NEW Analytics Solutions
Detect and Collect

Data Sources
- RS Linx Enterprise
- RS Linx Classic
- OPC (Kepware)

Connect

Discover

Collect
Connect to Data Source

- Create Data Server or OPC DA Server
- Create Device Shortcut or link to the controller or smart device
- Access to tag browser and real-time data
Agenda

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- **Visualize**
- Scalable Compute
- NEW Analytics Solutions
FactoryTalk VantagePoint
Product Overview

Enables real-time and historical connectivity to your Logix based data with trending, KPIs, and reporting that can be created and viewed from your PC or mobile device.

Connect to your real time or historical Logix based systems. Third party connectivity also exists. Data stays in it’s source. Just connect and analyze!

Organize data logically in a manner that makes sense to you!

View the data you’ve connected to on your mobile device or PC. Create a range of simple to more complex role displays ensuring users have access to the information they need, when they need it.
Visualize

MANAGEMENT

SUPERVISOR

OPERATOR

The Right Information, at the Right Time, with the Right Fidelity…
Storing data and creating displays in VantagePoint v8.0

Step 1

Step 2

Complete!
Agenda

- Connected Enterprise 101
- Detecting & Collection Simplified
- Visualize
- **Scalable Compute**
- New Analytics Solutions
ControlLogix Compute Module
SCALABLE COMPUTE

ENTERPRISE (Level 4)
- Private or Public Cloud
- On premise scales virtually, in cloud scales elastically
- Remotely administered

SYSTEM (Levels 2 through 3)
- Industrial or white-box computing
- Miniature IDC
- Virtually runs any application, has wider breadth
- On premise

DEVICE (Levels 1 through 2)
- In cabinet, in chassis, in controller computing
- Right size and form for function
- Helps analytics happen at correct level of hierarchy
- Edge Computing

CONNECTED SERVICES
- Design / Implementation / Integration
- Application Specific Support
- 24x7 Monitoring and Administration
- On-site Response
**ControlLogix Compute Module**

**HARDWARE FEATURES**

- **ControlLogix Compute**
  - Compute functionality in a single-slot ControlLogix module
  - Ability to directly communicate with a ControlLogix processor via the backplane

- **Monitor Interface**
  - DisplayPort supports standard converters for HDMI, DVI, VGA displays
  - Intel HD graphics (2650 x 1600 resolution)

- **Windows® 10 IoT Enterprise LTSB (64-bit) or Linux (32-bit)**
  - Intel Atom 1.46 GHz dual-core processor
  - 32 GB SSD (approx. 20 GB free space for user applications)
  - 4 GB RAM

- **Ports**
  - (1) USB 3.0 port
  - (2) 1-GB Embedded Ethernet ports
ControlLogix Compute Use Cases

Rockwell software or third-party applications may be installed on the compute module for applications such as

- FactoryTalk View SE Station
- OPC UA data access with FactoryTalk Linx
- Data logging and processing
- SQL Server interface (For example, manage recipe, store recipe data, store production data)
- Machine optimization (For example, machine to machine comparisons)
- Communication gateway to read/write to remote devices
- Add local intelligence to stand-alone or unconnected machines
Agenda

Connected Enterprise 101
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New Analytics Solutions
New Trend Control: Trend Pro

OVERVIEW

- New trend control
- Data Sources
  - Live Data
  - View SE datalog data sources
  - FT Historian data source
- Up to 20 traces including FTAE alarms

BENEFITS

- Leverages the VantagePoint trend control which provides market leading capabilities, without requiring VantagePoint to be part of the system.
- Easy runtime configuration
- Easy drag & drop ad-hoc trending
- Statistical and Sampling calculations
Exporting Trend Data

OVERVIEW

- TrendPro runtime functionality
  - Export trend data to CSV files
  - Interpolated or raw values
  - Narrow and Wide format
- TrendX runtime functionality
  - Export trend data to CSV files
  - Export historical data from datalogs to CSV file

BENEFITS

- Easily capture historical data to reference or analyze later
- Convenient CSV format
INTRODUCING

FactoryTalk Analytics for Devices
### Common Problems

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait for something to go wrong</td>
<td>11%</td>
</tr>
<tr>
<td>I have a few configured HMI alarms for common problems</td>
<td>45%</td>
</tr>
<tr>
<td>I have lots of configured HMI alarms for covering every possible problem</td>
<td>24%</td>
</tr>
<tr>
<td>I have another diagnostic solution</td>
<td>4%</td>
</tr>
<tr>
<td>🔄 I don't know</td>
<td>16%</td>
</tr>
</tbody>
</table>
MONITOR & INTERACT WITH IIoT DEVICES, IMPROVE PLANT HEALTH

**Detect** your smart devices, automatically

**Digitize** the data, allowing work to be done

**Analyze** the data, perform calculations, transform the data

**Act** on information, get to the right people, on the right device

*Immediate value delivered as an Industrial Appliance; Self-contained and FactoryTalk Cloud aggregation options*
FactoryTalk Analytics for Devices

Dashboards

Includes:

- Identifies the Device
- Performs Diagnostic Assessment
- Supporting Important Data
- Significant Diagnostics

All done automatically!
The engine will “learn” what is important to a specific person.

If you choose to acknowledge the card with a swipe right, you’ll get more cards just like it.

- In FactoryTalk TeamONE, pinning to the team board or sending in chat is also an “up vote”

- If you do not want to see a card, a swipe left will “down vote” these types of cards from that device.

- After several down votes, you will not see more action cards from that device.
INTRODUCING FactoryTalk® Analytics for Machines
Data structures in the controller (Rapid AOI)
FactoryTalk® Cloud Gateway
Secure transfer of data to the cloud
Storage and processing of data (Runs on Azure)
Pre-defined dashboards and analysis tools
Pre-Built Dashboards

Secure Cloud gateway

Pre-defined controller data structures (Line integration ready)
Thank You!