

„Industrielle Instandhaltung in IoT Zeiten – der Big Data Megahype!?“

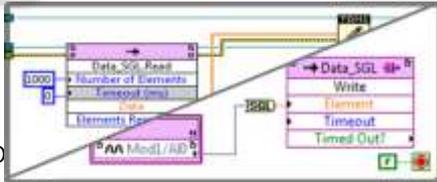


Günther Stefan  
Business Development Manager  
IIoT & Condition Monitoring  
CEER

# "Raspberry PI" for IIoT



NATIONAL INSTRUMENTS  
**LabVIEW**



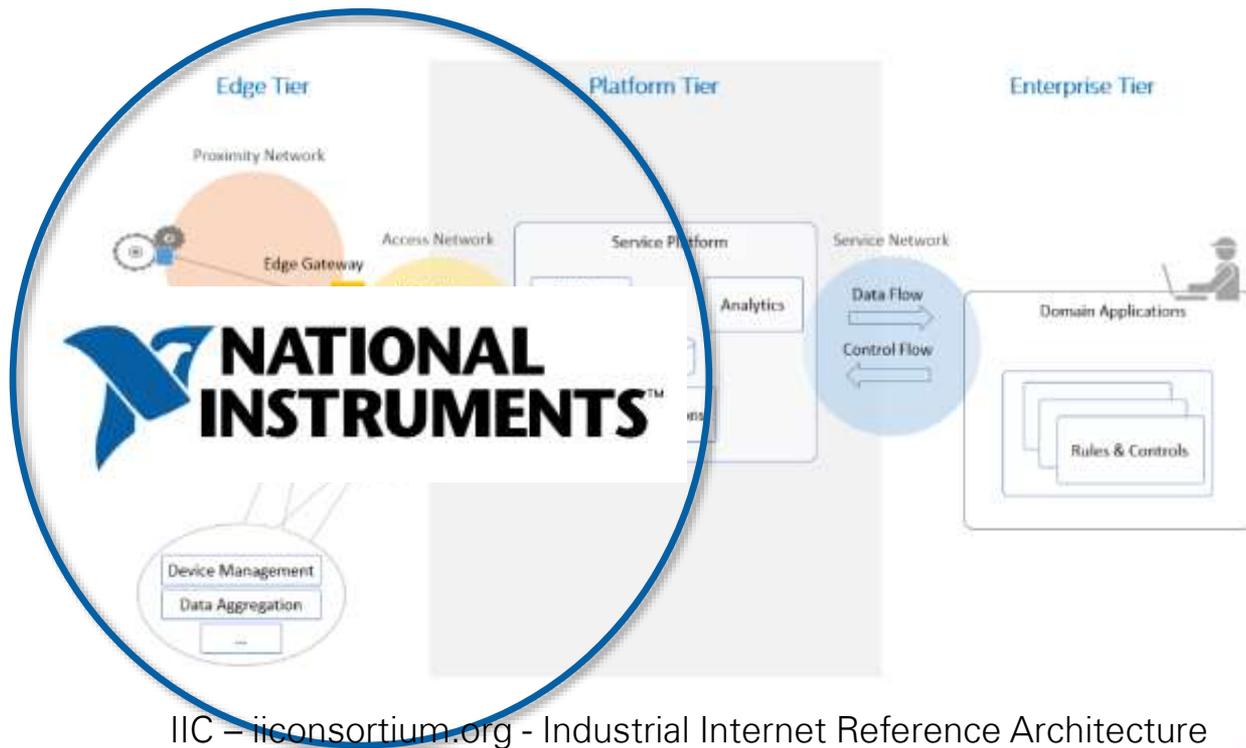
NI CompactRIO



# Topics to Cover Today

- Why should we monitor?
- NI InsightCM: application software for monitoring
- NI InsightCM demo using chilled water pumps in Austin
- Applications of NI's monitoring technology and NI InsightCM

# NI's role in IIoT



IIC – [ii-consortium.org](http://ii-consortium.org) - Industrial Internet Reference Architecture

# Predictive Maintenance

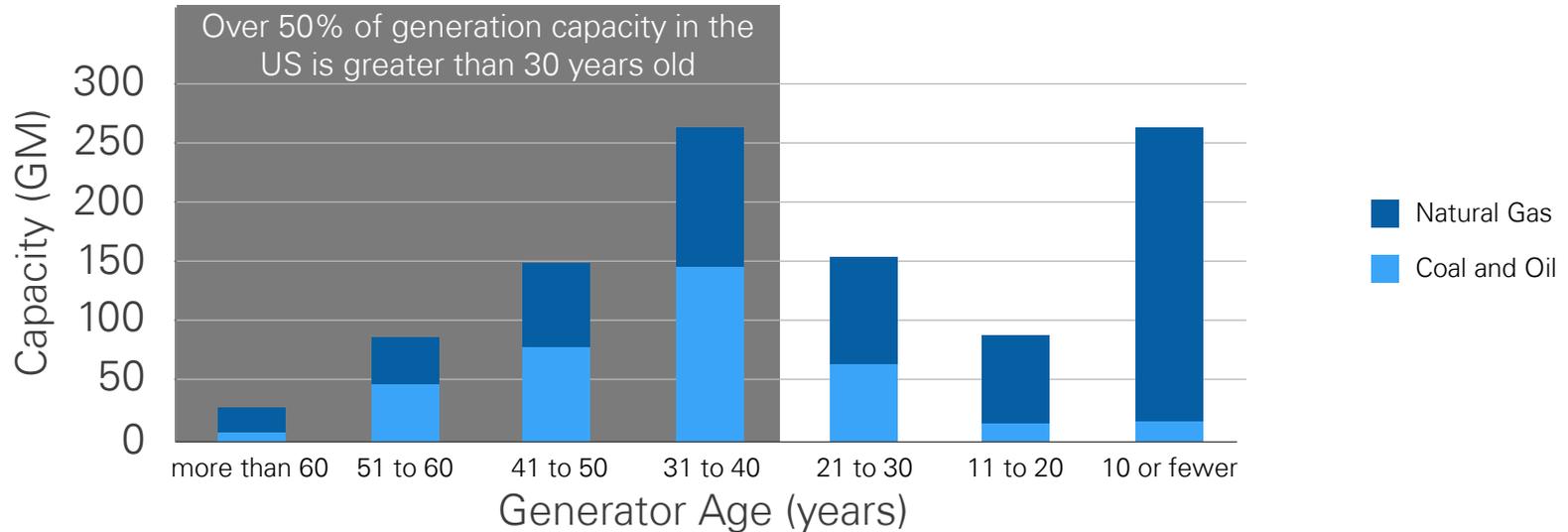
One of the number one IIoT topics

# Sayano-Shushenskaya Hydroelectric Plant

August 2009



# Generation Capacity is Approaching Retirement Age



Source: US Energy Information Administration, Form EIA-860 Annual Electric Generator Report and Form EIA-860M (see Table ES3 in the March 2011 Electric Power Monthly)  
ni.com



...Unscheduled shutdowns, coupled with poor maintenance practices, cost global process industries 5% of total production annually, equivalent to \$20B each year.

—Hydrocarbon Publishing Company

# Maintenance Strategy Objectives

## Increase Revenue

- Increase uptime and service offerings
- Optimize maintenance activities

## Decrease Cost

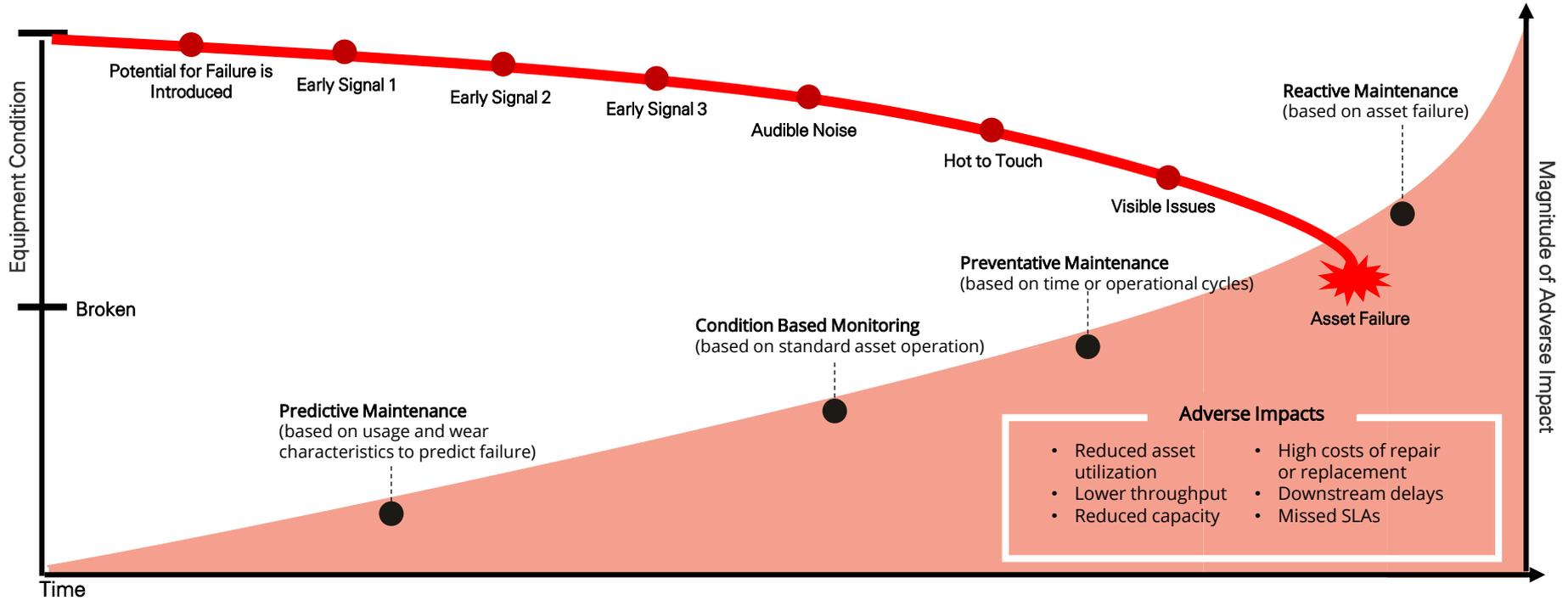
- Reduce frequency of unscheduled downtime
- Decrease warranty costs
- Optimize workforce

## Reduce Risk

- Prevent failure and unscheduled outages
- Reduce worker contact with hazardous machines and environments

# The Case for Predictive Maintenance

Predictive maintenance can use specific techniques (vibration analysis, infrared analysis, thermography, passive ultrasound, motor circuit analysis, lubricant analysis, and several others) to listen and analyze signals in order to identify and predict the presence of a failure mode



Early detection of a potential failure provides time to plan and schedule replacement or restoration without interruption to production

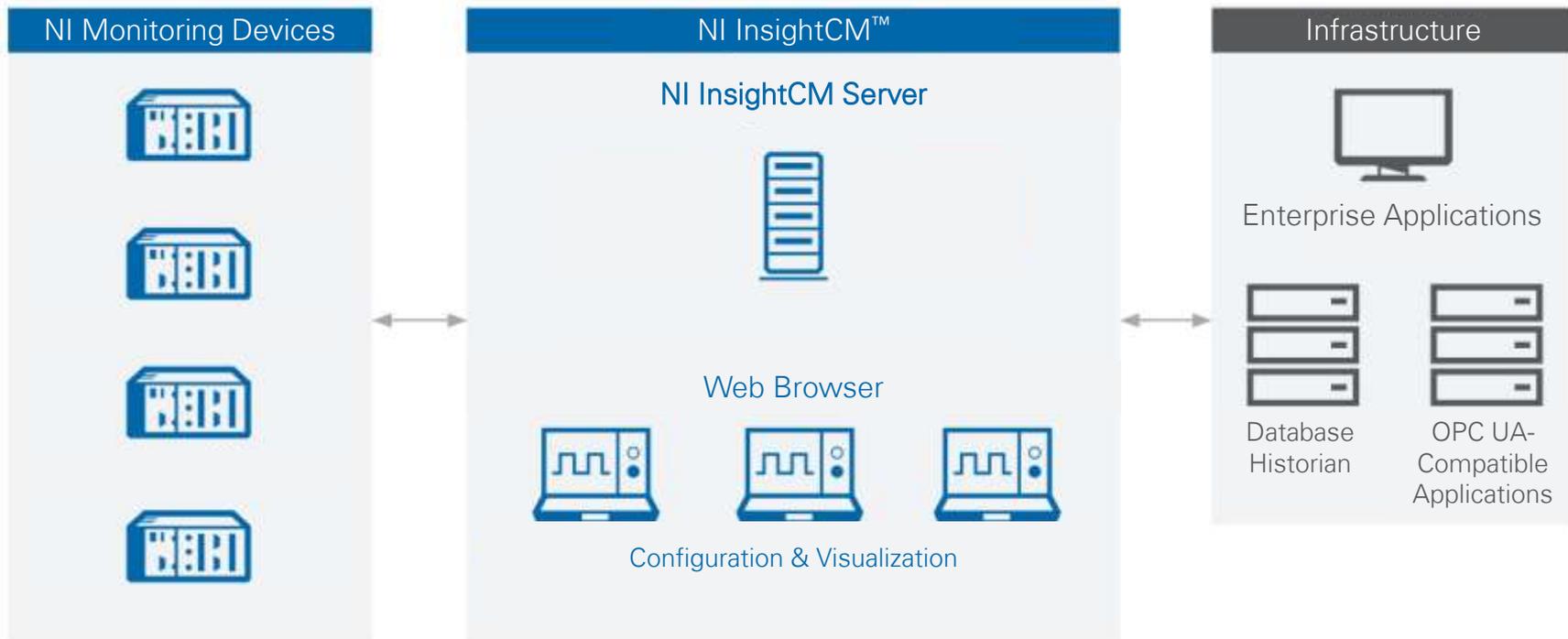
# NI InsightCM™

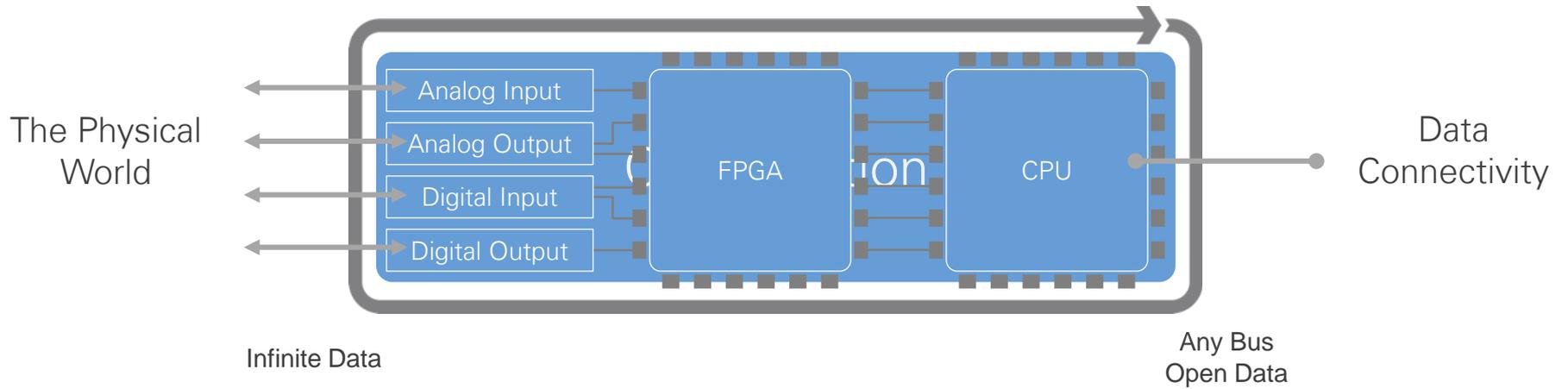
Application software tailored for online monitoring applications

- Configuration-based acquisition and data management tools
- Wide range of dynamic waveform and static sensor input options
- Deployment-ready hardware bundles available
- Complete accessibility to data
- Connectivity to third-party systems and analytics via LabVIEW

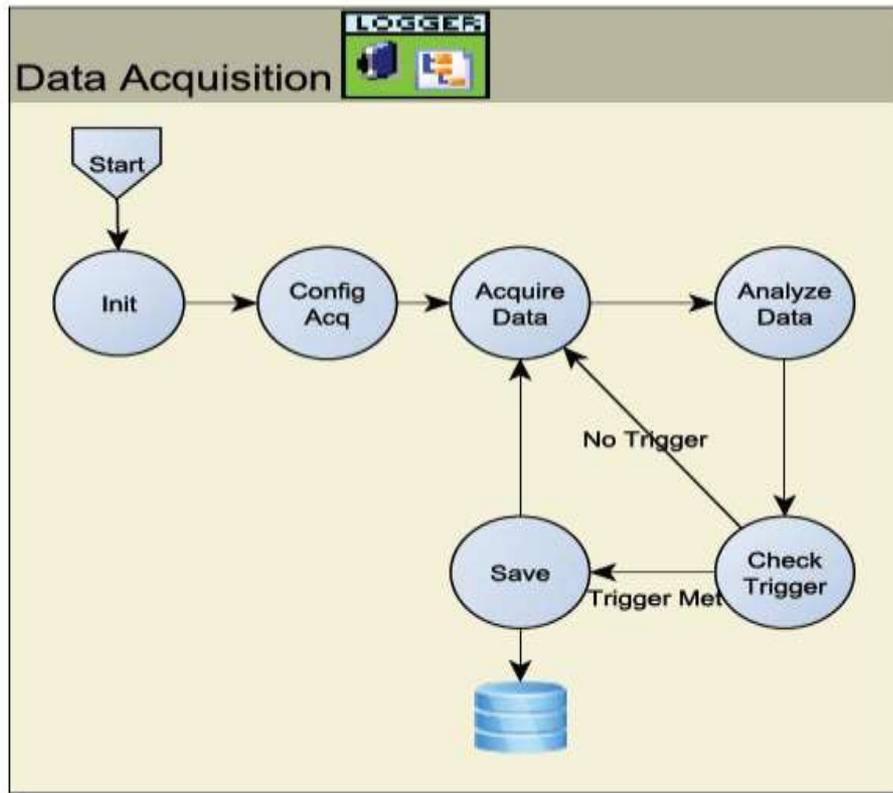


# NI InsightCM Components

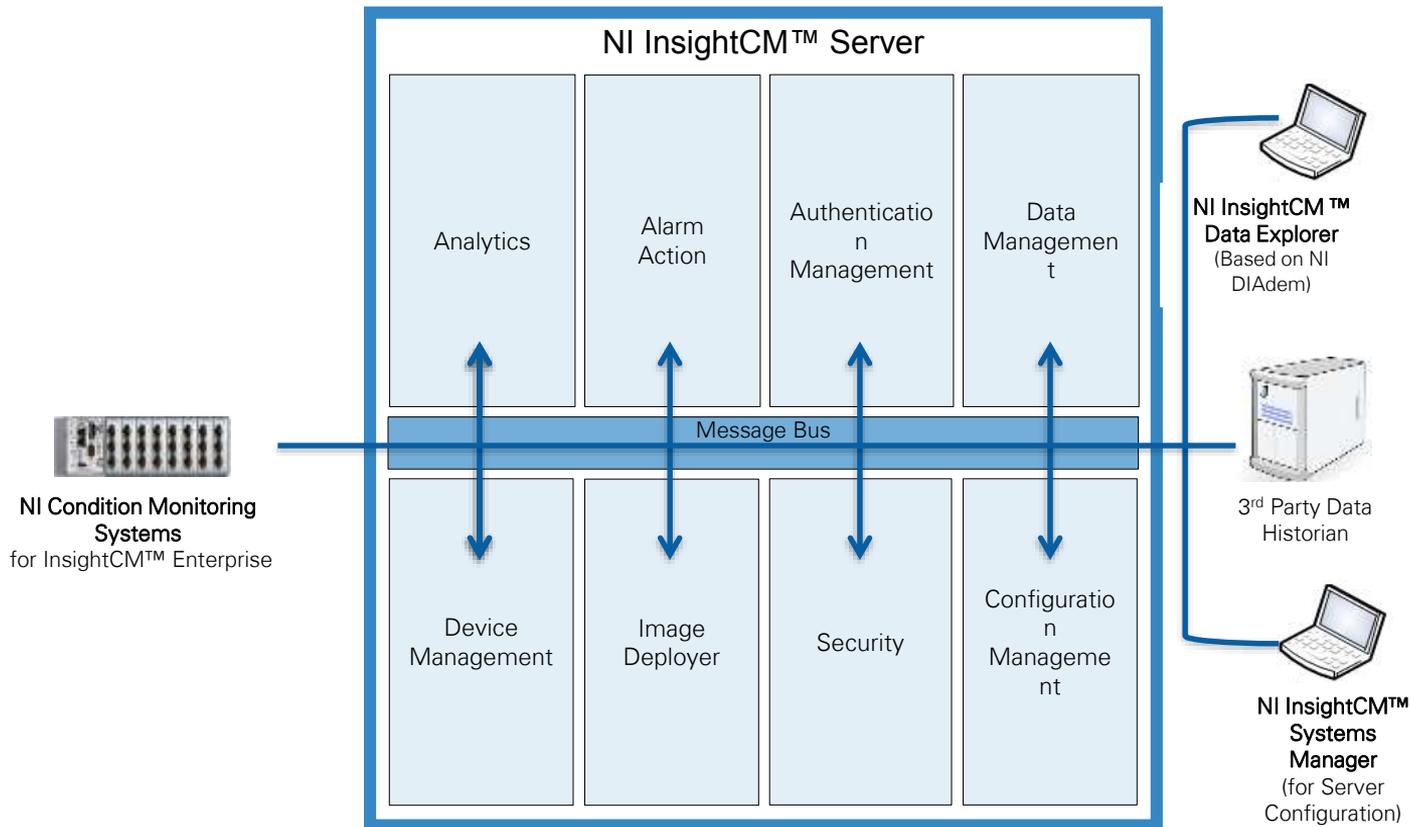




# Smart Firmware with Store and Forward Architecture

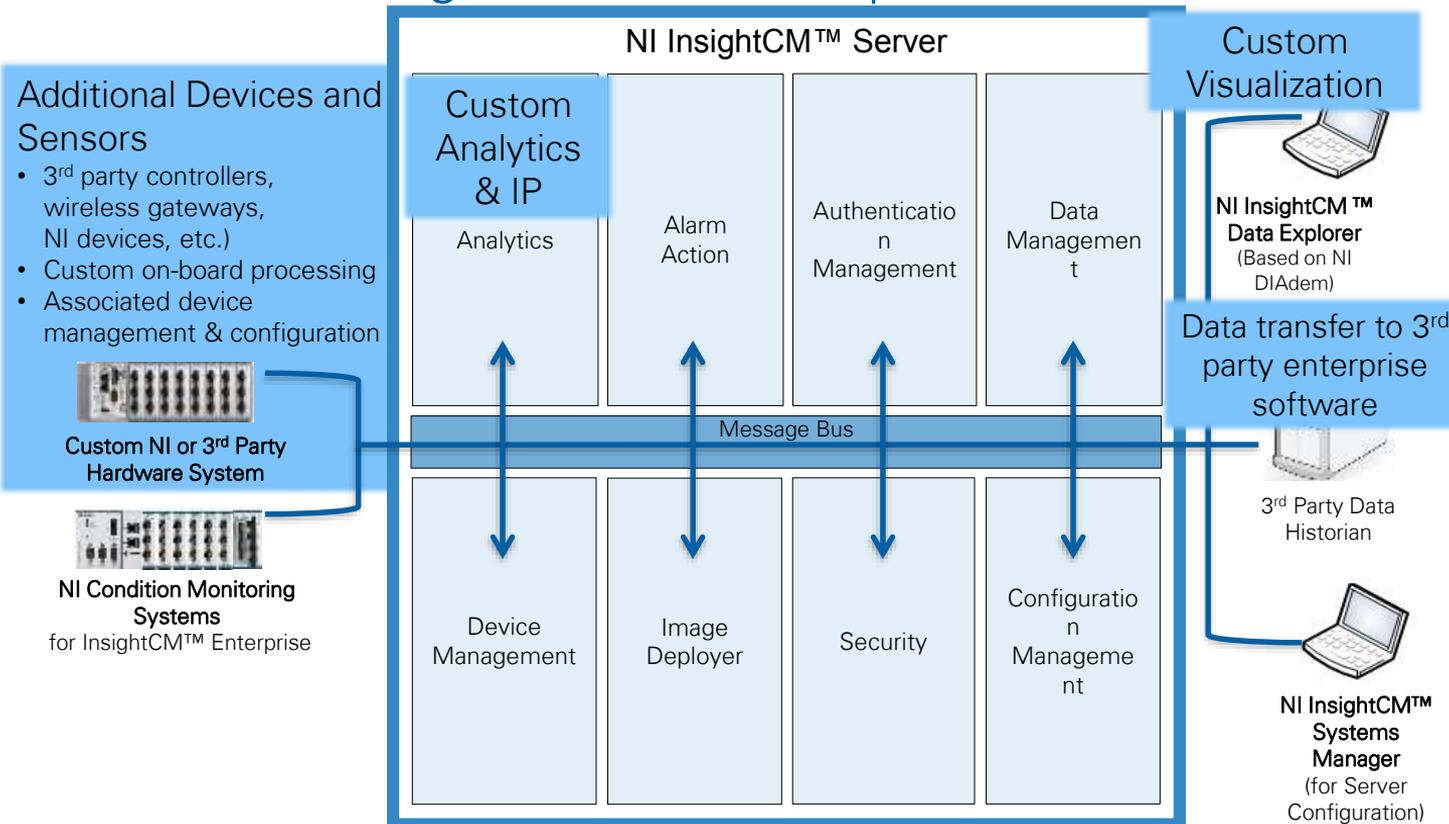


# NI InsightCM™ Server - Underlying Architecture



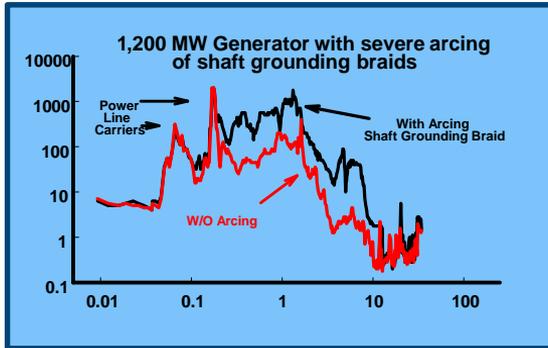
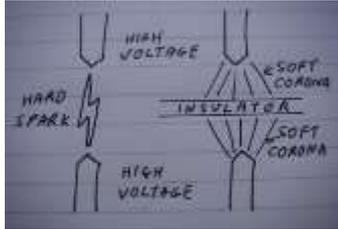
# NI InsightCM™ Server - Underlying Architecture

## Ways to Customize using Software Development Kit

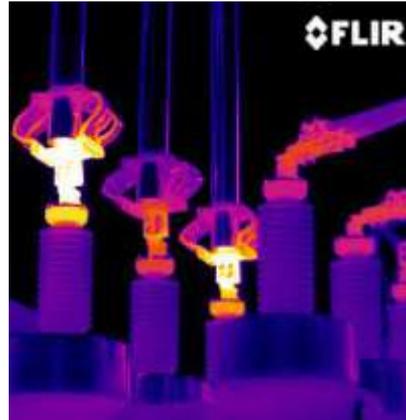


# Advanced Sensors

## EMSA



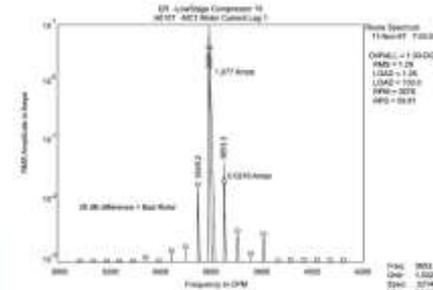
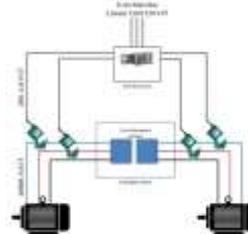
## Thermography



CVS-1457RT



## MCSA



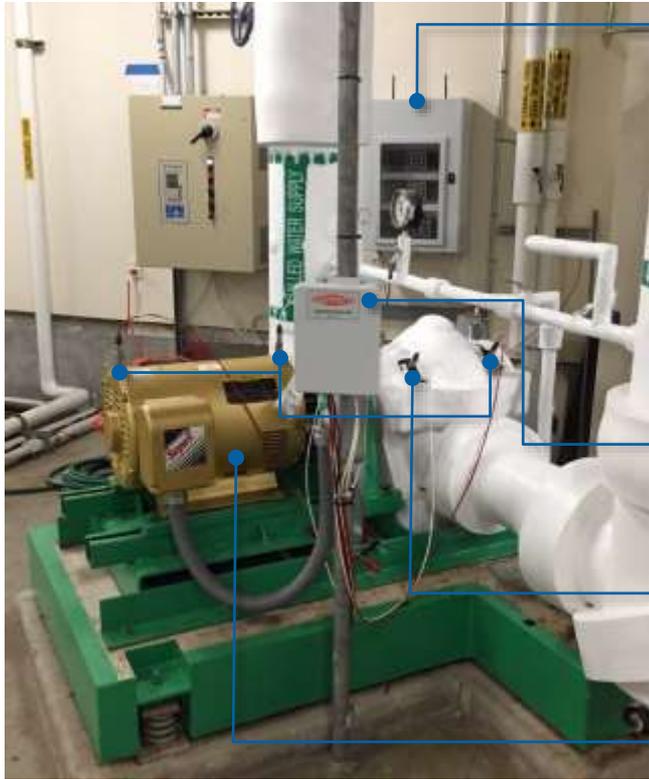
# NI Monitoring Devices Installed at Edge



# NI InsightCM Demo

Using a demo system installed at NI in Austin, Texas

# NI HVAC Installation



- Panel
- Network & power
- NI Monitoring Devices
- Cable reduction box
- Sensors (accelerometers)
- Asset (chilled water pump)



# Demo Configuration

Try it yourself:  
[ni.com/try-insightcm](https://ni.com/try-insightcm)



NI Monitoring Devices  
installed at NI

[ni.com](https://ni.com)

Internet



NI InsightCM Server  
hosted in the cloud



ThingWorx  
A TEST DRIVEN

<https://www.youtube.com/watch?v=xiAXXI36w8g>

Partner Applications  
hosted in the cloud



You



# Applications

NI's monitoring technology and NI InsightCM in use for industry applications



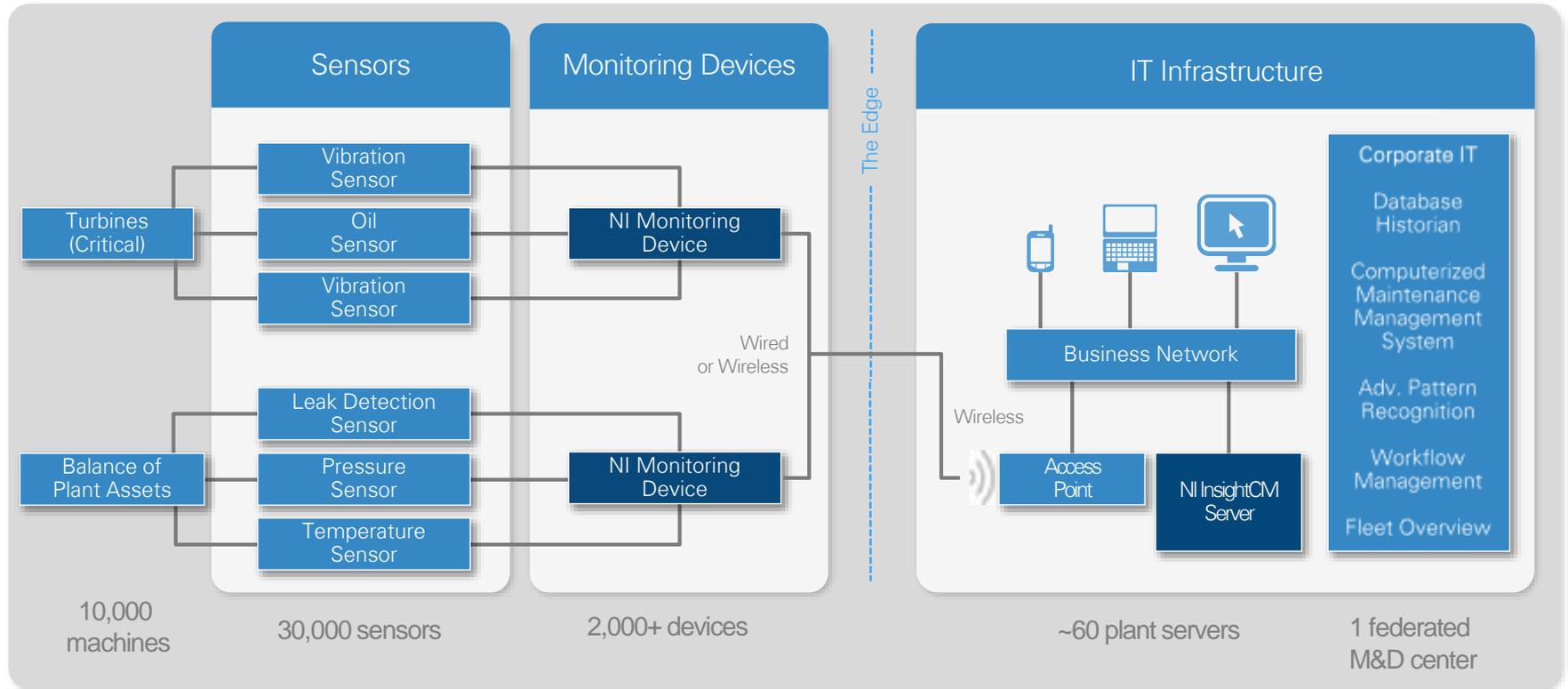
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Largest Power Generation  
Holding Company in US

38 GW Fossil Generation  
Capacity



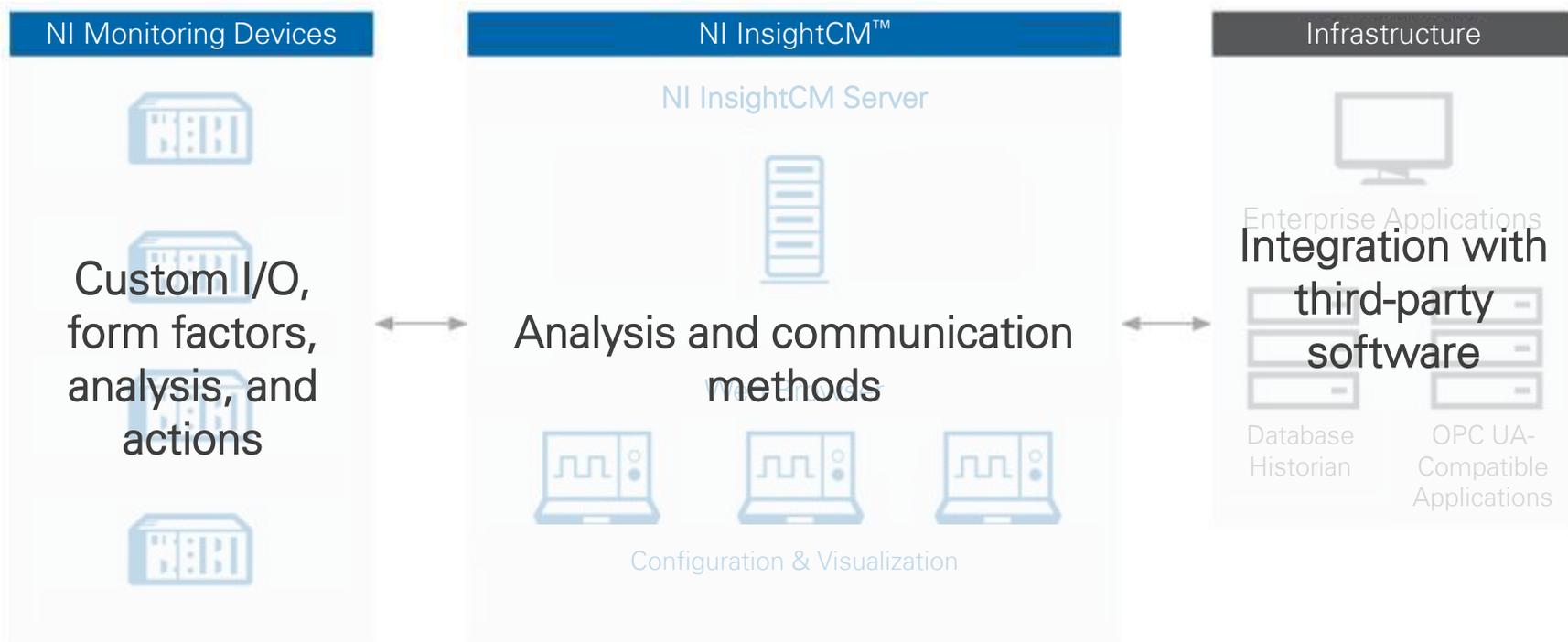
# Fossil Power Plant Monitoring



# Customizing NI InsightCM

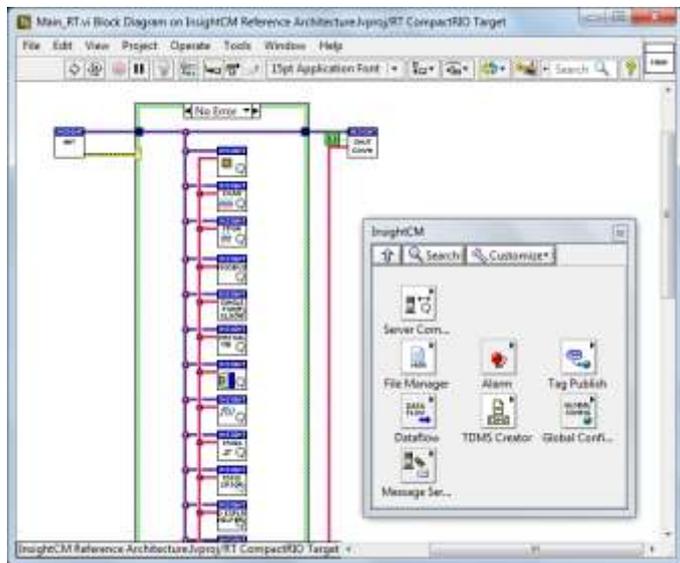
An open platform behind the deployment-ready capabilities

# Customized Monitoring Solution



# Extend NI InsightCM with Software Development Kit

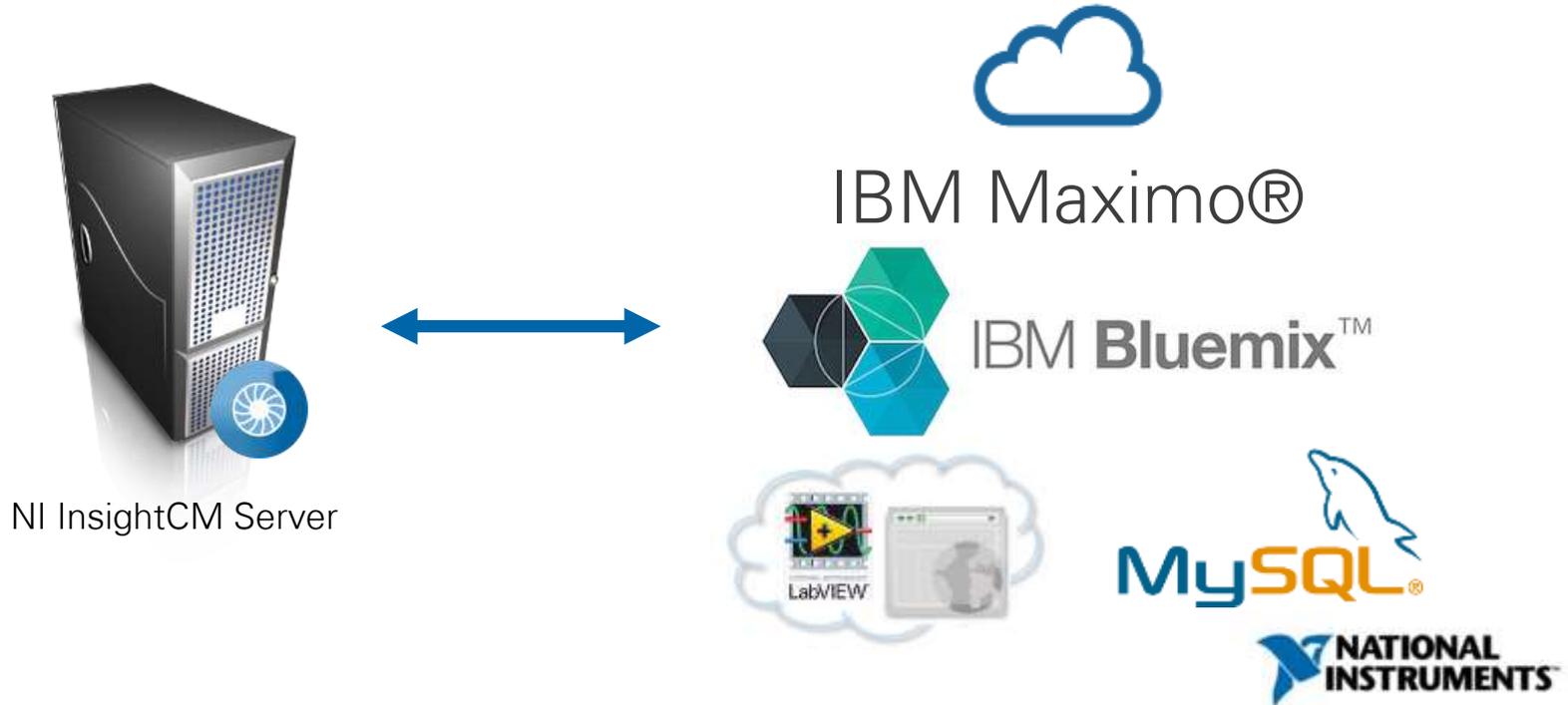
Build your IP and customize a monitoring solution without owning an entire software architecture



- Integrate InsightCM with third-party applications
- Add new device communication methods, edge analytics, and triggering options
- Address application I/O requirements
- Manage third-party hardware with InsightCM

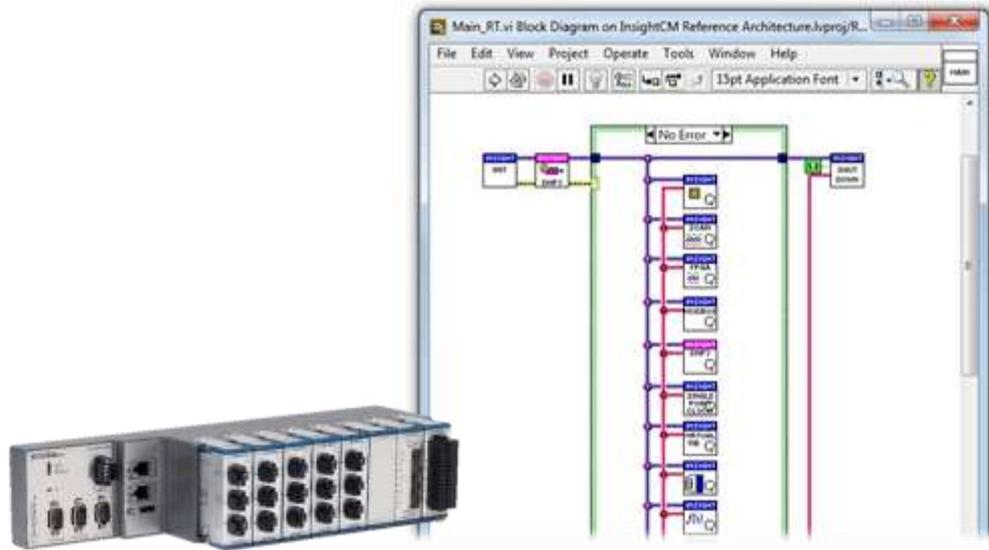
# Integrate InsightCM with Third-Party Applications

Implement code that enables data within InsightCM to be shared with third-party applications.



# Add Custom Process to NI Monitoring Systems

Modify NI Monitoring Systems to add new processing, alarming, data collection, and communication methods to extend the solution.



# Add Hardware Support to NI Monitoring Systems

Modify a standard device to support custom hardware to address custom I/O needs and form factors.



# Manage Third-Party Hardware with NI InsightCM

Allow InsightCM to manage, configure, and store data from third-party hardware.

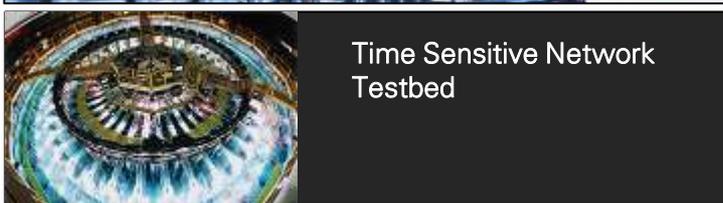


Non-NI Hardware



NI InsightCM Server

# Industrial Internet Consortium Testbeds



# Online Monitoring with NI InsightCM™

- Optimized workforce with remote, centralized monitoring
- Few gaps in data with continuous monitoring and event notifications
- Improved diagnosis with automatic analysis and historical diagnosis notes



ni.com

Learn more:  
[ni.com/insightcm](https://ni.com/insightcm)

