EMERSON EXCHANGE 2025

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Let Integrated Patch Management help make you more Cybersecure and Efficient

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Lifecycle Services Program Manager / Emerson

Agenda

Kurt Schlawin	About the site
Kurt Schlawin	IPM Journey and Challenges faced
Matt Kane	IPM Overview
Kurt Schlawin	IPM Experience and Evolution of IPM usage
Kurt Schlawin	Results Achieved
Matt Kane	References and Additional Information

Bayer / Muscatine, Iowa Site

We are committed to developing a diverse range of crop protection solutions, offering farmers more precise ways to apply the right protection at the right time. Our work in Muscatine helps bring these solutions to farmers.

Manufacture & Package Agricultural Products

- 63 years of operations
- 150+ Acre Facility
- 425+ Employees
- 8 Operating Units – 4 Production DeltaV Systems, 4 TNG

Production

70% of North America's Roundup® Herbicide

100% of the Acetanilide Selective Chemical Products

100% of the Bayer Dicamba Formulations

VPP Voluntary Protection Programs An OSHA Cooperative Program

ISO 9001 COMPLIANT

RESPONSIBLE CARE® OUR COMMITMENT TO SUSTAINABILITY

WILDLIFE HABITAT COUNCIL

HARNESS® Herbicide by Monsanto | Roundup POWERMAX® HERBICIDE | WARRANT™ HERBICIDE | ROUNDUP READY® XTEND CROP SYSTEM | Degree xtra® HERBICIDE

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Bayer Muscatine's Journey with Microsoft Patch Management

The Bayer Journey

DeltaV v10 and Before:

Microsoft Patching on Initial Installation
Microsoft Patching for critical updates only

DeltaV v11:

Microsoft Patching on Initial Installation
Manual Microsoft Patching as time allowed (maybe once/year)

DeltaV v13:

Microsoft Patching on Initial Installation
Installation of Emerson's Automated Patch Management (APM)

DeltaV v14:

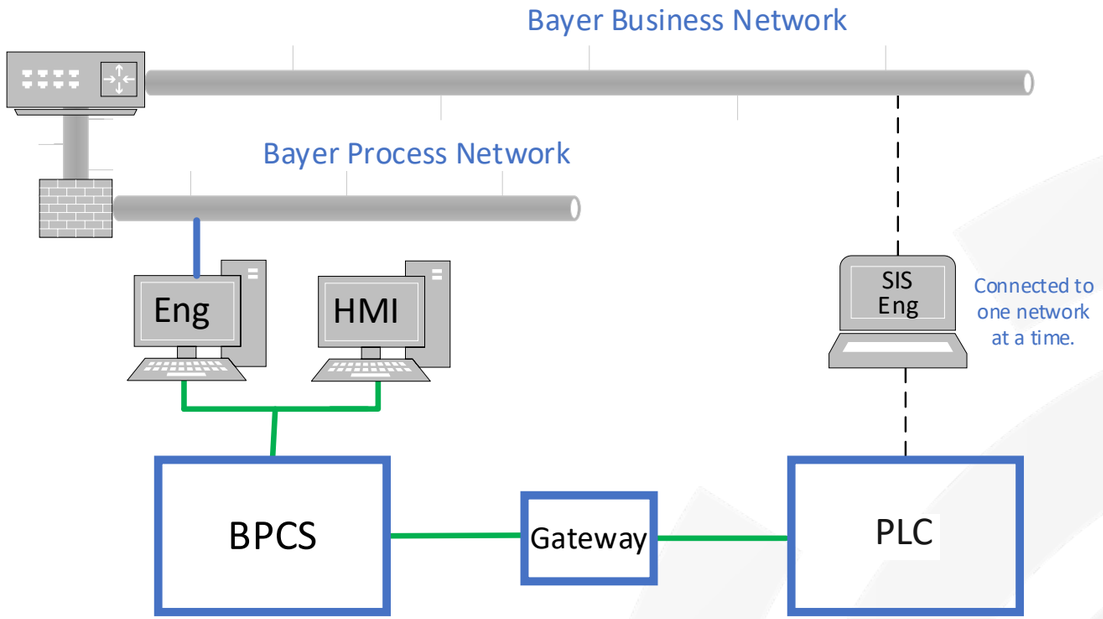
Microsoft Patching on Initial Installation
Installation of Emerson's Integrated Patch Management (IPM)
Worked with Emerson on installing several new versions of IPM

Functional Safety / Safety Interlocking

Historical:

Our critical safety systems (SIL 1-3) were implemented in an air-gapped design, so not directly connected to the DeltaV BPCS or plant networks.

Interlock PLC Design

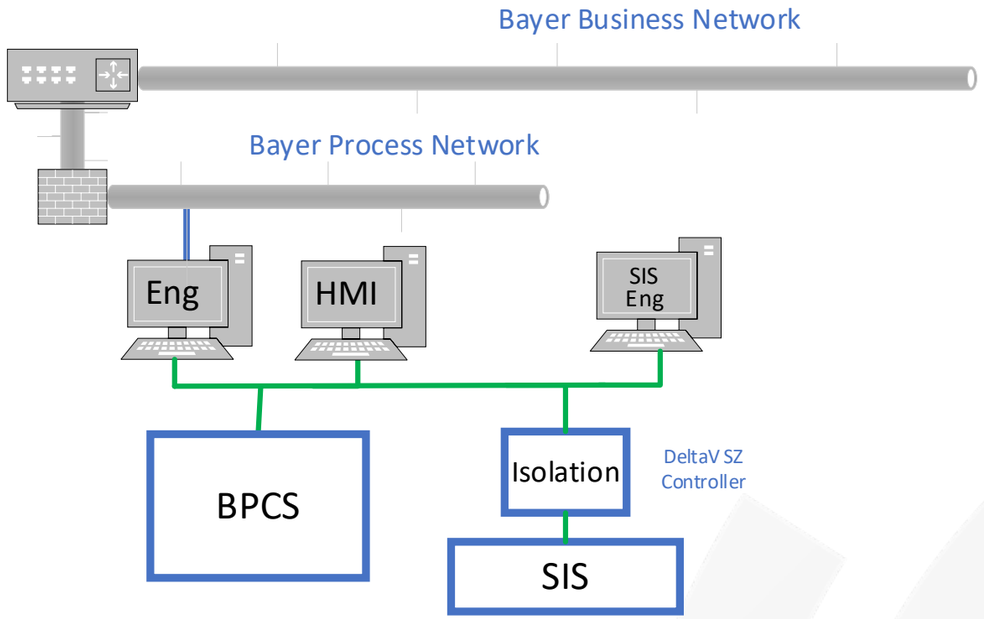


Functional Safety / Safety Interlocking

Current and Future Design:

Our critical safety systems (SIL 1-3) are being transitioned to an integrated DeltaV SIS design.

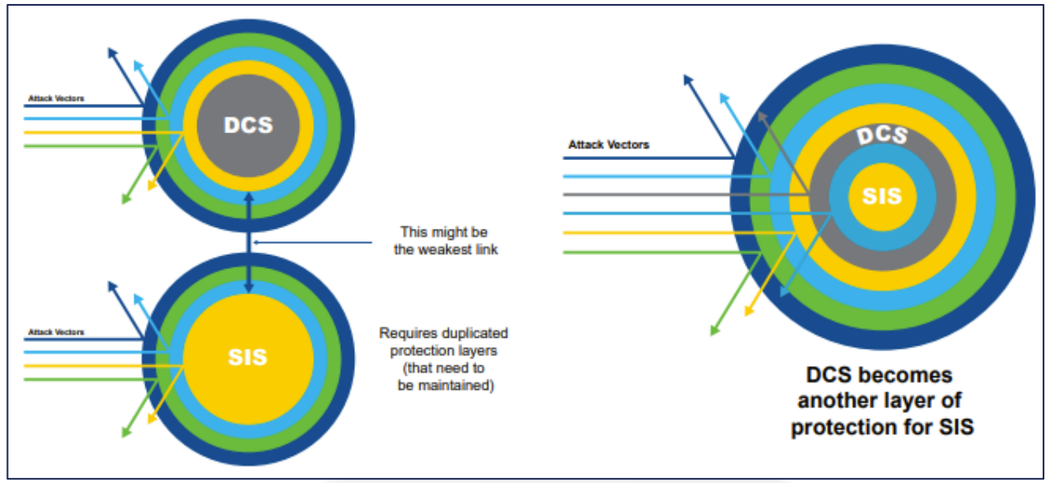
DeltaV SIS Design



- Integrated, but Separate Design

Bayer's Security for Safety

- Creation of a new Bayer 'Security for Safety' Knowledge Document, outlining the requirements for installing an "Integrated" Safety System
  - Allows for more designs than just an air-gapped safety system design
  - Air-gapped safety systems have vulnerabilities also, just different
- Introduction of new Cybersecurity protection applications
  - Two Factor Authentication (2FA) when making DeltaV SIS changes
  - Application Whitelisting
  - Zone Firewall
  - Cyber-Independent Shutdown
  - Integrated Patch Management (IPM)
    - Microsoft Patching, Trellix Anti-Virus, DeltaV Hotfixes



- Integrated Patch Management (IPM) is one protection layer that requires routine resources, not just an install, schedule, and monitor.
  - Need to optimize these efforts for the limited site process control resources.

Challenges

Control System Support Challenges:

- High workload to support and maintain DeltaV and related systems
- Mostly Manual Microsoft Patching Process system in place
- Difficult and time consuming to maintain IT and Security compliance
- Microsoft Patching updates was individual based, rather than process based.

Objective:

- Streamline the Microsoft Patching process and increase Microsoft Patching frequency utilizing DeltaV Integrated Patch Management (IPM).

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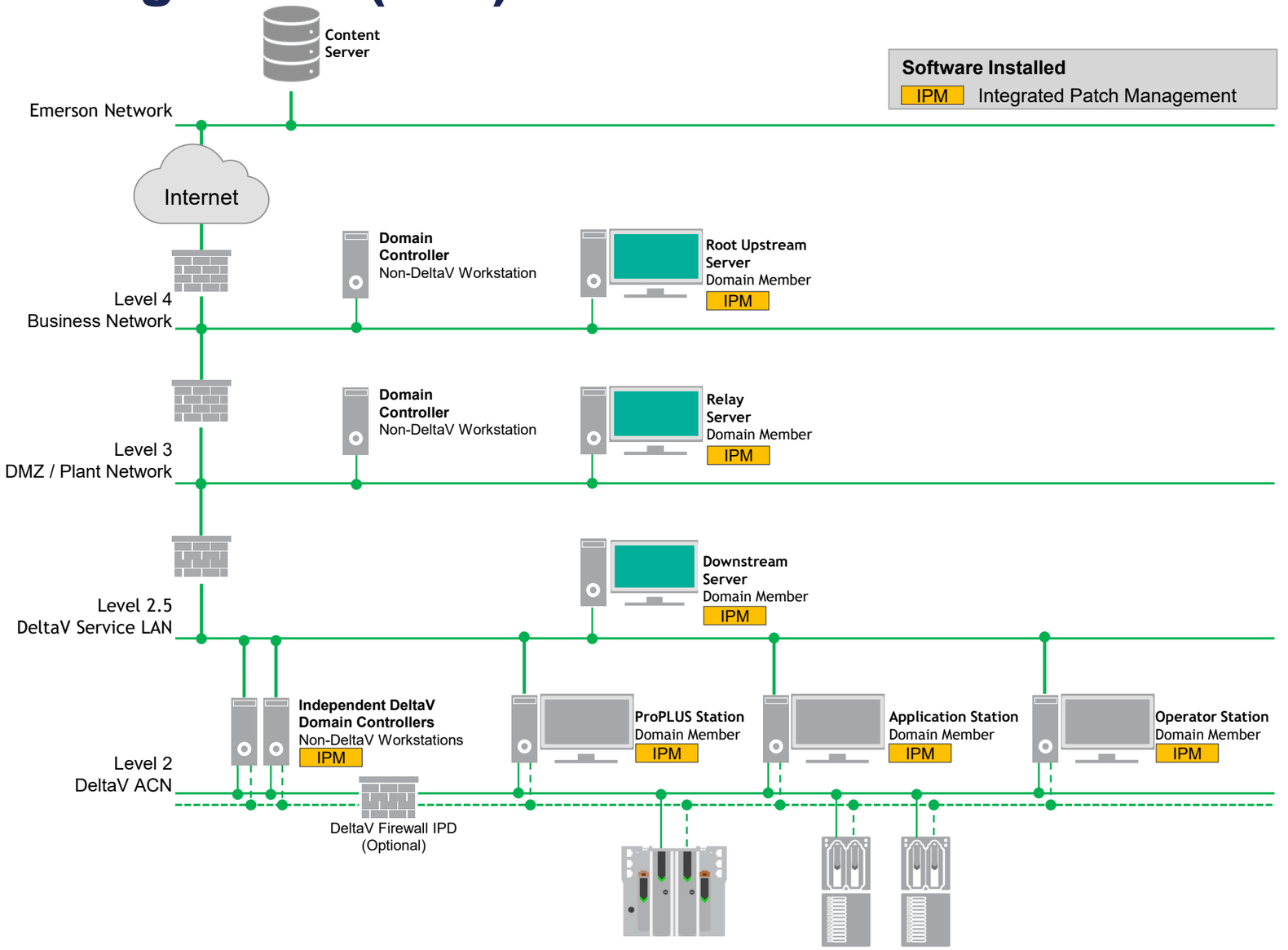
Integrated Patch Management (IPM) Product Overview

DeltaV Integrated Patch Management (IPM)

THE NEXT-GENERATION PATCH MANAGEMENT SOLUTION FOR DELTAV.

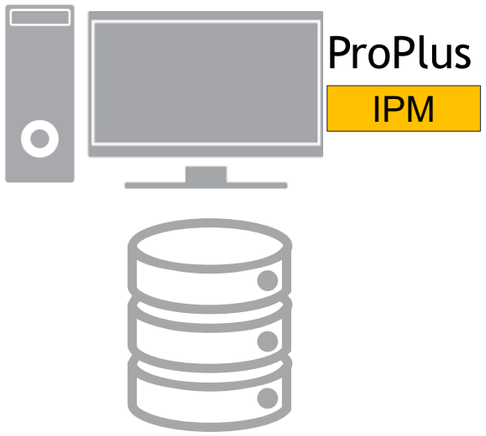
Key Features

- Most secure patching solution available
- Easy to use interface for both locally or remotely maintaining your assets
- Flexible & scalable architecture to accommodate customer requirements
- Save hours of effort through automation



How IPM Works

Downstream Server



DeltaV Database

Populate IPM database with all workstation and device data

Downstream Server

DeltaV workstations and servers provide current patch and hotfix levels (included embedded nodes) to the Downstream Server

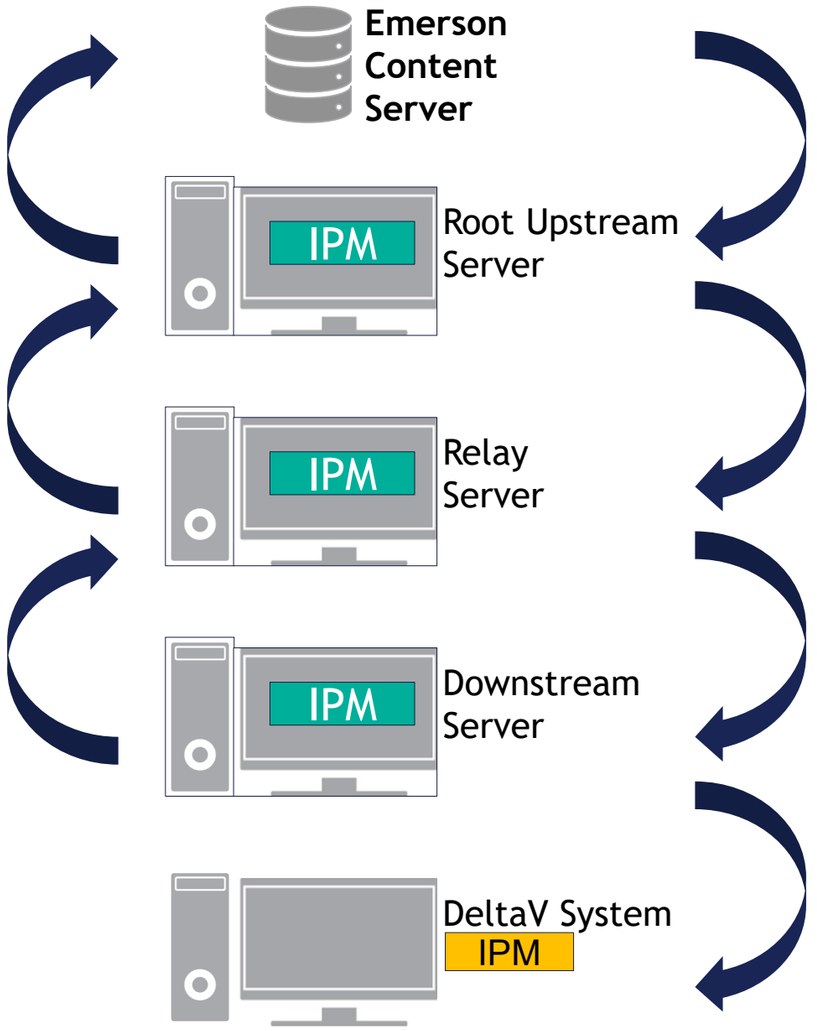
How IPM Works (continued)

4

The Root Upstream server passes information onto the Emerson content server for processing.

3

Information about current patch levels are passed up to the Root Upstream Server.



5

The content server determines what patches/hotfixes are required for each node. The Root Upstream downloads this information along with the required updates.

6

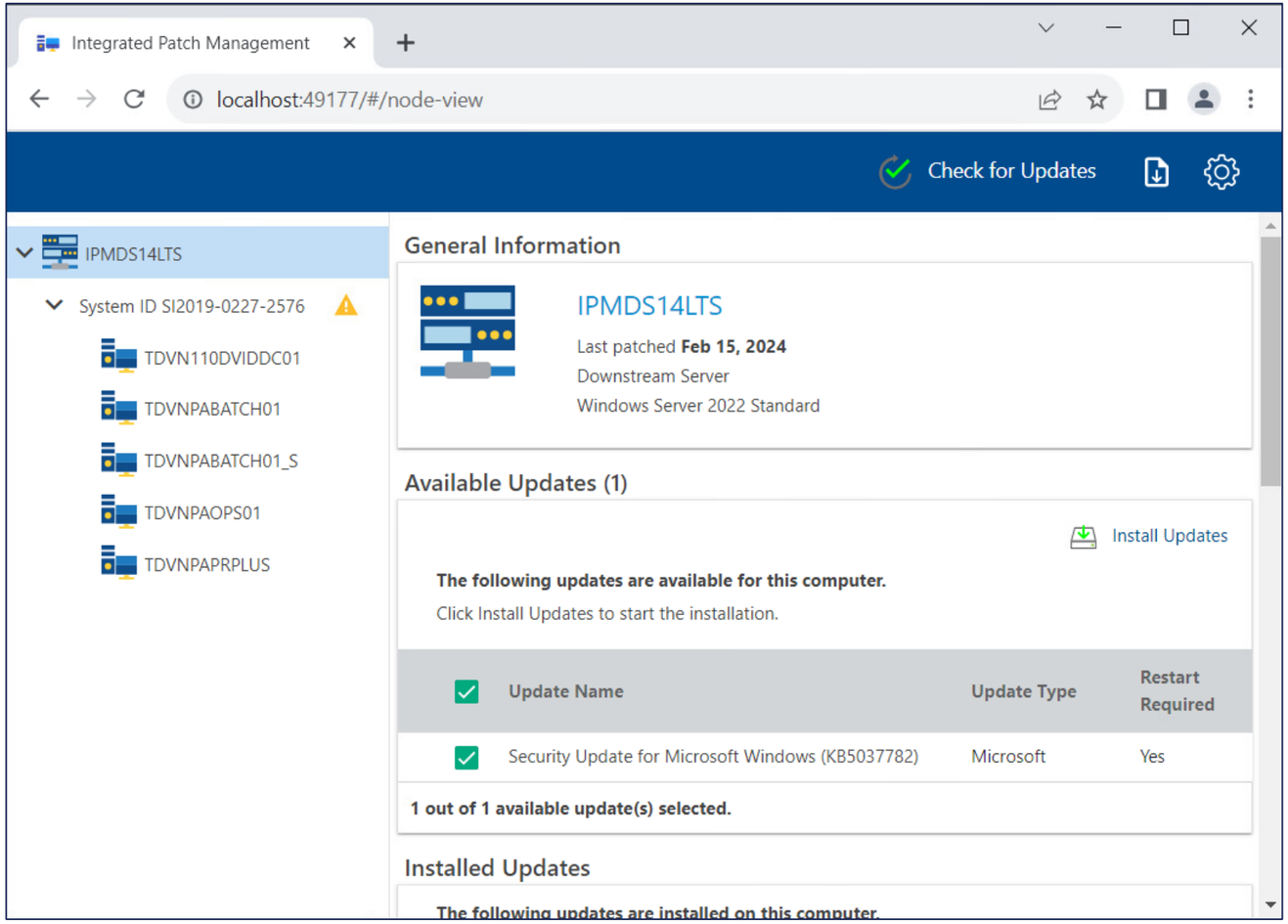
Downstream Server delivers patches to the DeltaV stations, waiting for installation.

IPM User Experience – Management Console

The **Management Console** is the main user interface for the Integrated Patch Management System.

Functions within the Management Console:

- Download Microsoft patches
- Install patches to DeltaV workstations
- Monitor installation results
- Audit installed patches
- Set preferences for Integrated Patch Management operations



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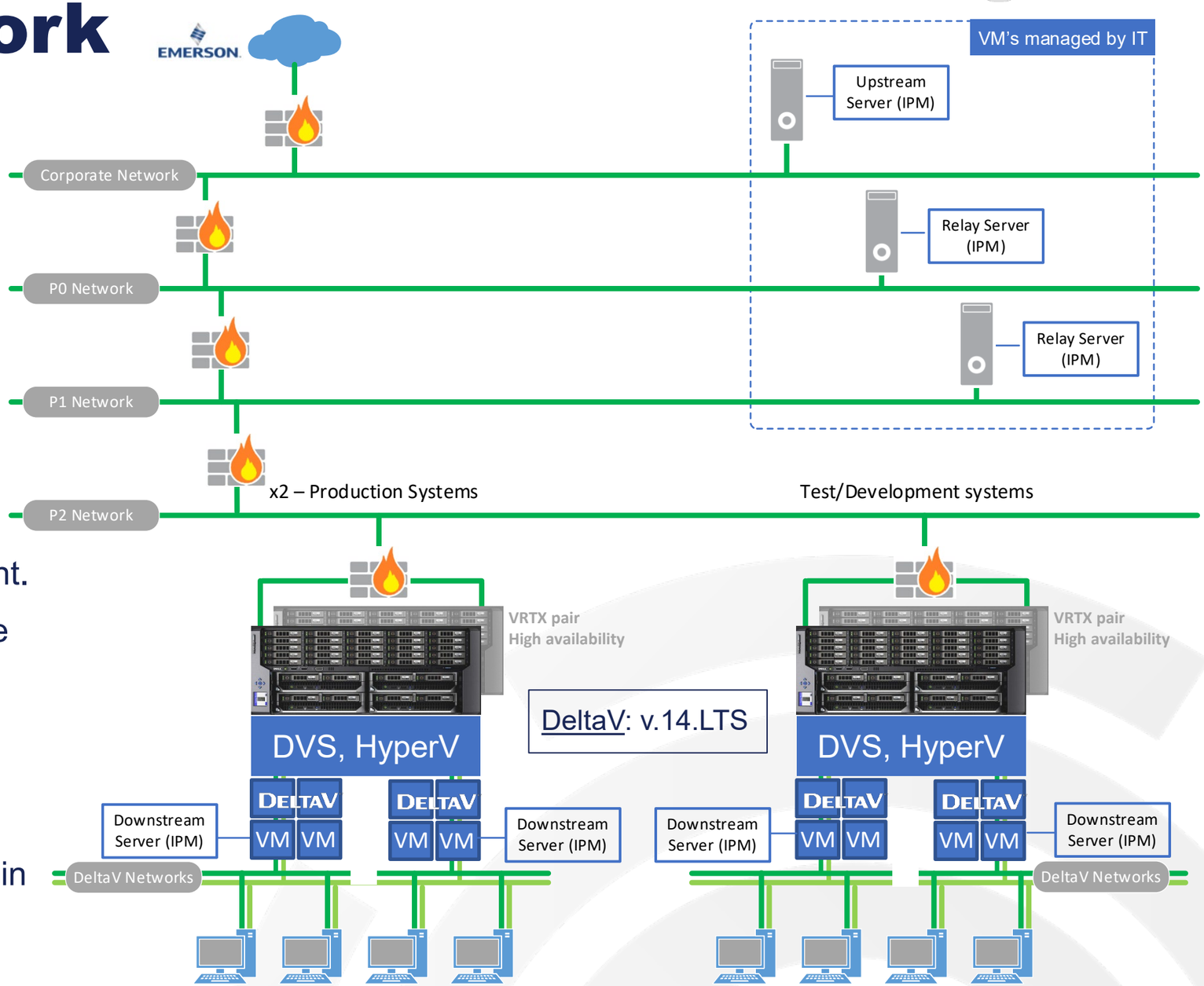
Experience with Integrated Patch Management (IPM)

Bayer IPM Network (IPM v1.4.0.0)

- Network Architecture
  - 4 Network Levels
    - CNB / P0 / P1 / P2
  - North/South Firewalls
  - East/West Firewalls

- Root Upstream and Relay servers are virtual and in a Bayer domain environment.
- Downstream and DeltaV workstations are in a DV domain environment.

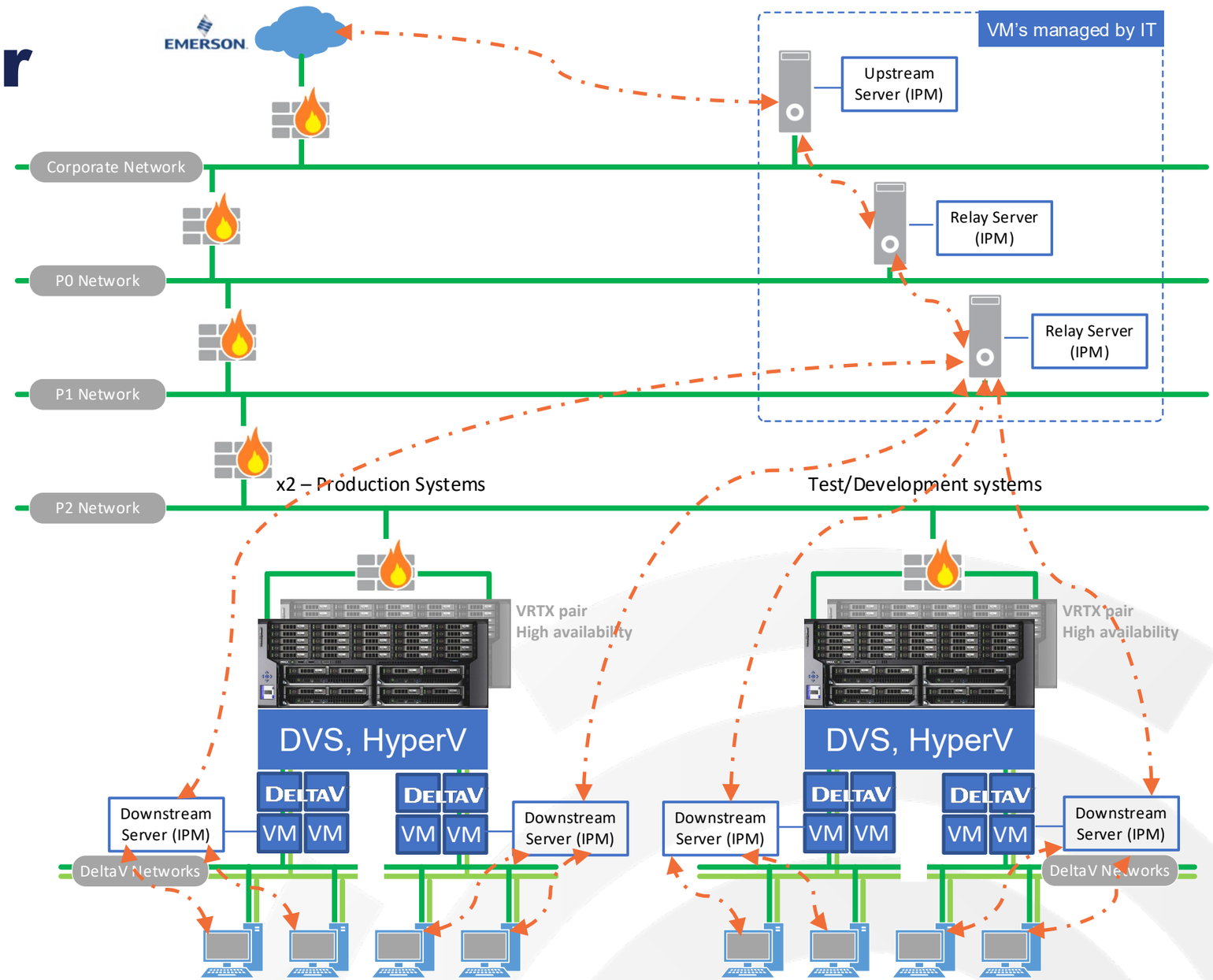
- Root Upstream Server is also a Trellix EPO server (AV and Whitelisting).
- DeltaV systems have Independent Domain Controllers (IDCs).



IPM Relay Server

- Site needed to install 2 IPM Upstream Relay Servers to navigate the Bayer Network Blueprint.

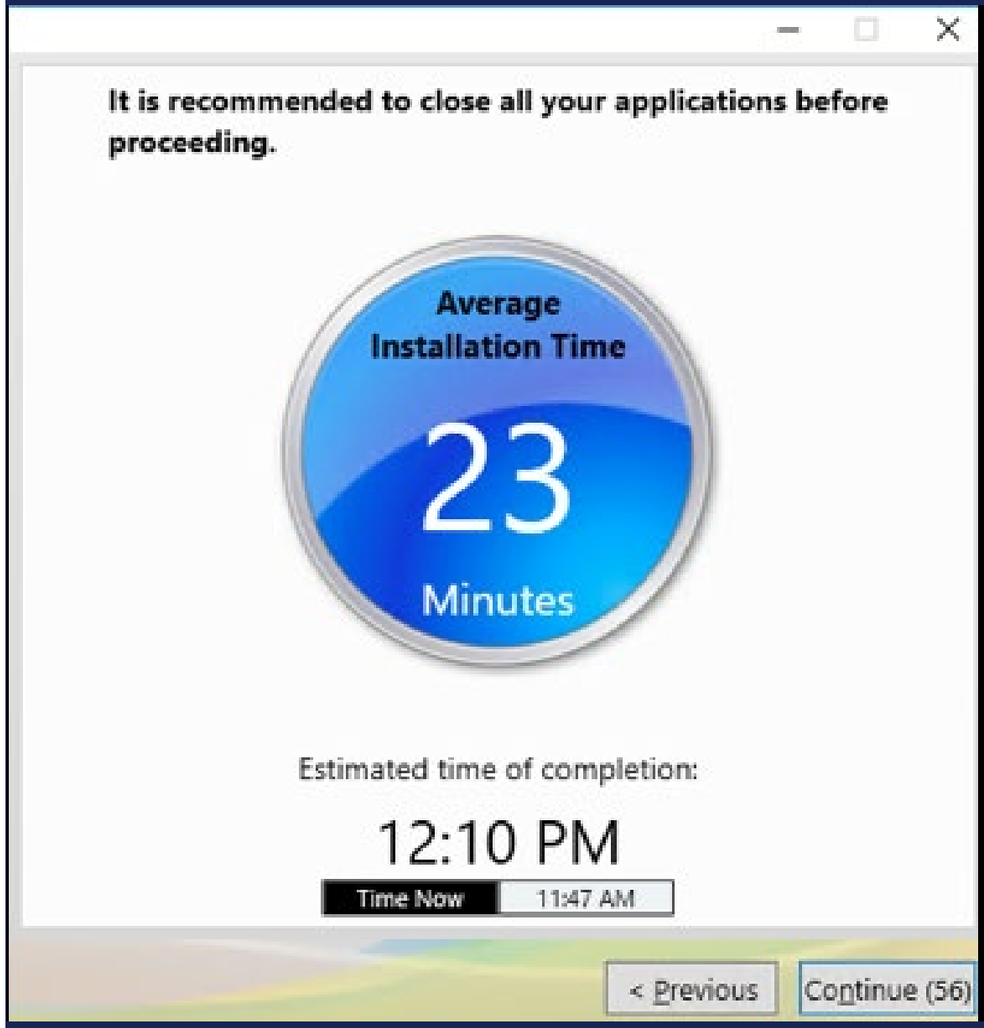
- Bayer network traffic can only communicate with their neighboring networks.



IPM Installation at Bayer

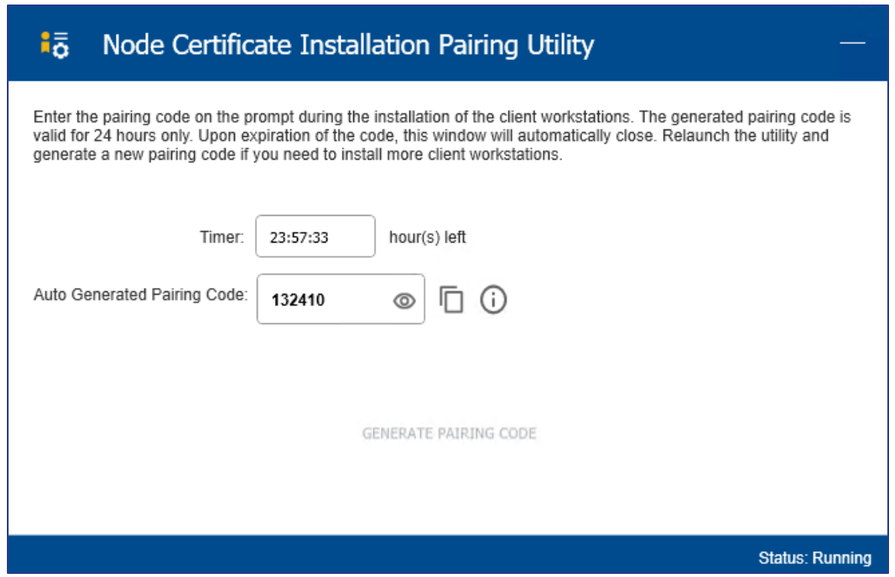
- 1 Root Upstream Server
- 2 Relay Upstream Servers
- 8 Downstream Servers (1/DeltaV System)
  - 4 DeltaV Production Systems
  - 4 DeltaV Training/Development Systems
- 75 DeltaV Workstations; 24 Non-DeltaV Workstations

- IPM Installation is Simple; Easy to follow instructions
  - IPM Installation and User Guide (v1.4)
  - KBA NK-2000-0559: IPM Troubleshooting Guide

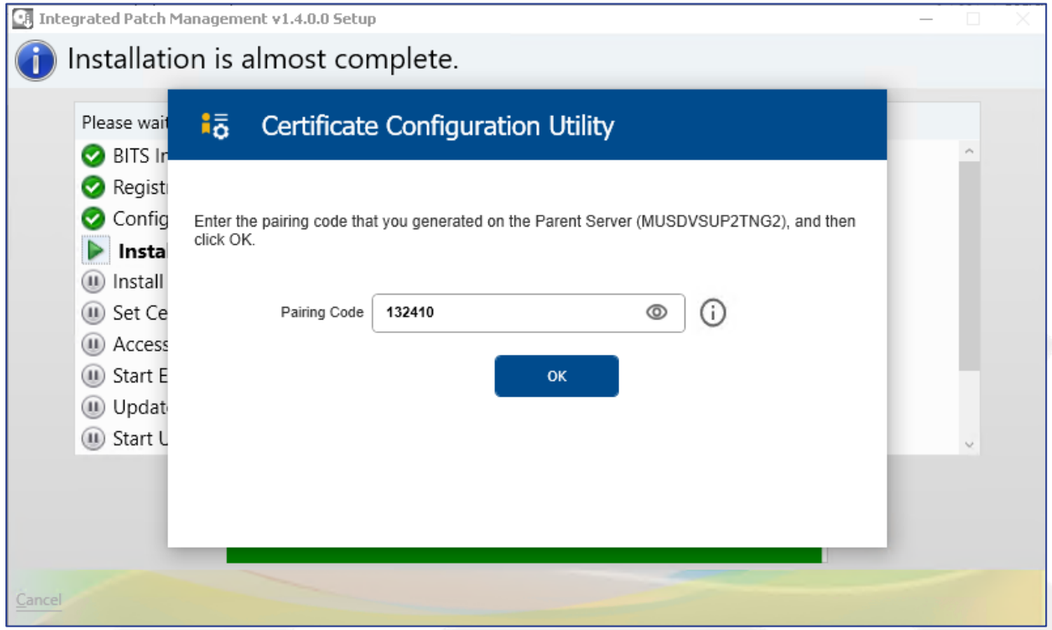


Security Feature

- Usage of Web Certificates
  - Upstream Server



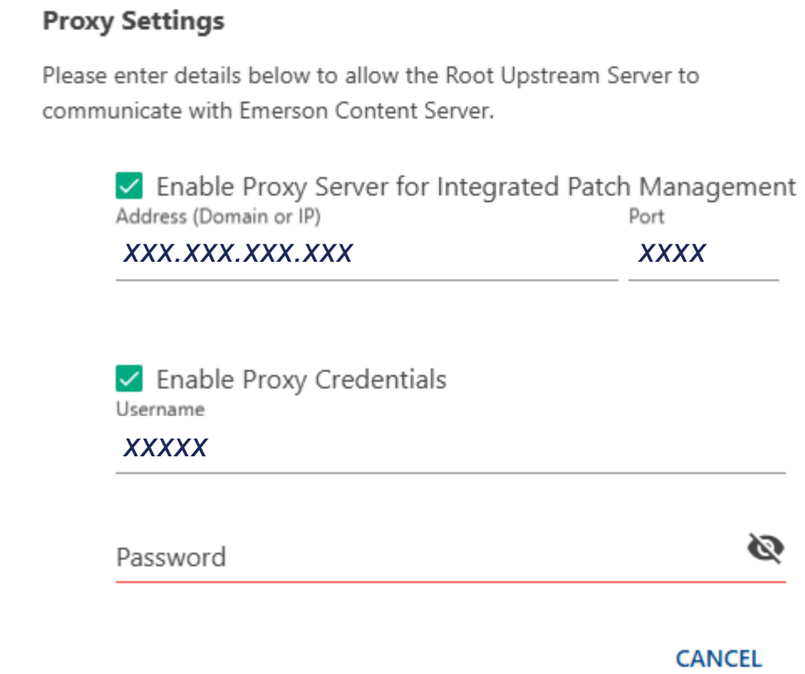
  - Downstream Server

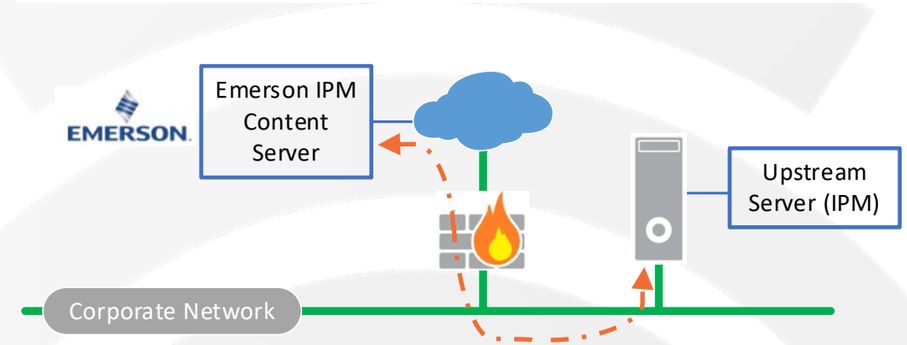


  - Easier than Passing Web Certificates around manually, etc.
  - Maximum Certificate Validity is 365 days.

Proxy Server Connections

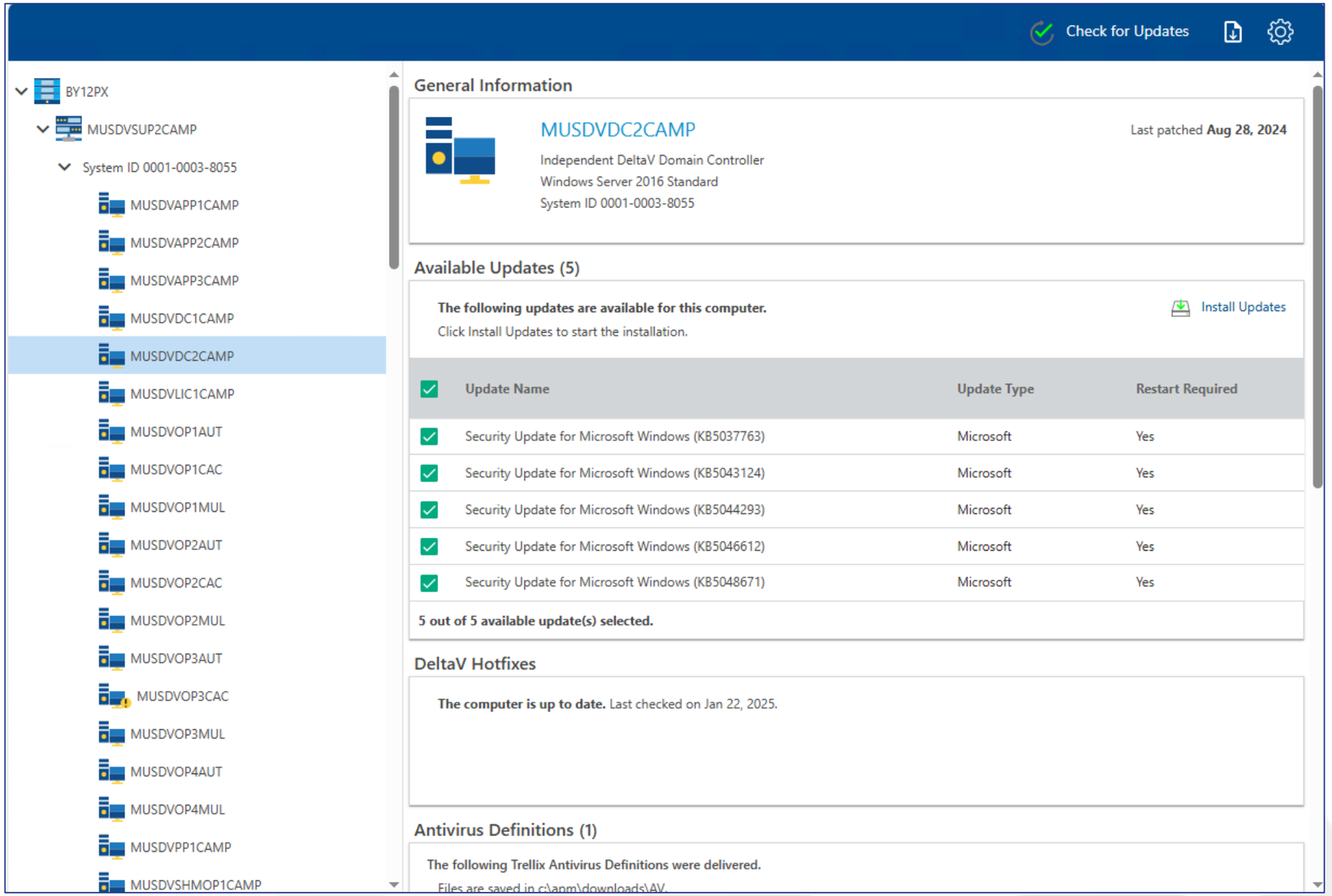
- Historical Challenges
  - Proxy server connections of other applications have been a challenge working with corporate IT to gain/setup access.
    - Historically, port redirection or a 1:1 NAT setup was required to allow access to the Bayer Proxy Server. Matching configuration was required on both the Proxy Server and application server.
- IPM Application
  - IPM is Proxy Aware and makes the implementation much easier
  - On the Upstream IPM server, we just had to provide the necessary Bayer user credentials and Bayer web traffic is allowed to the Emerson IPM Content Server.





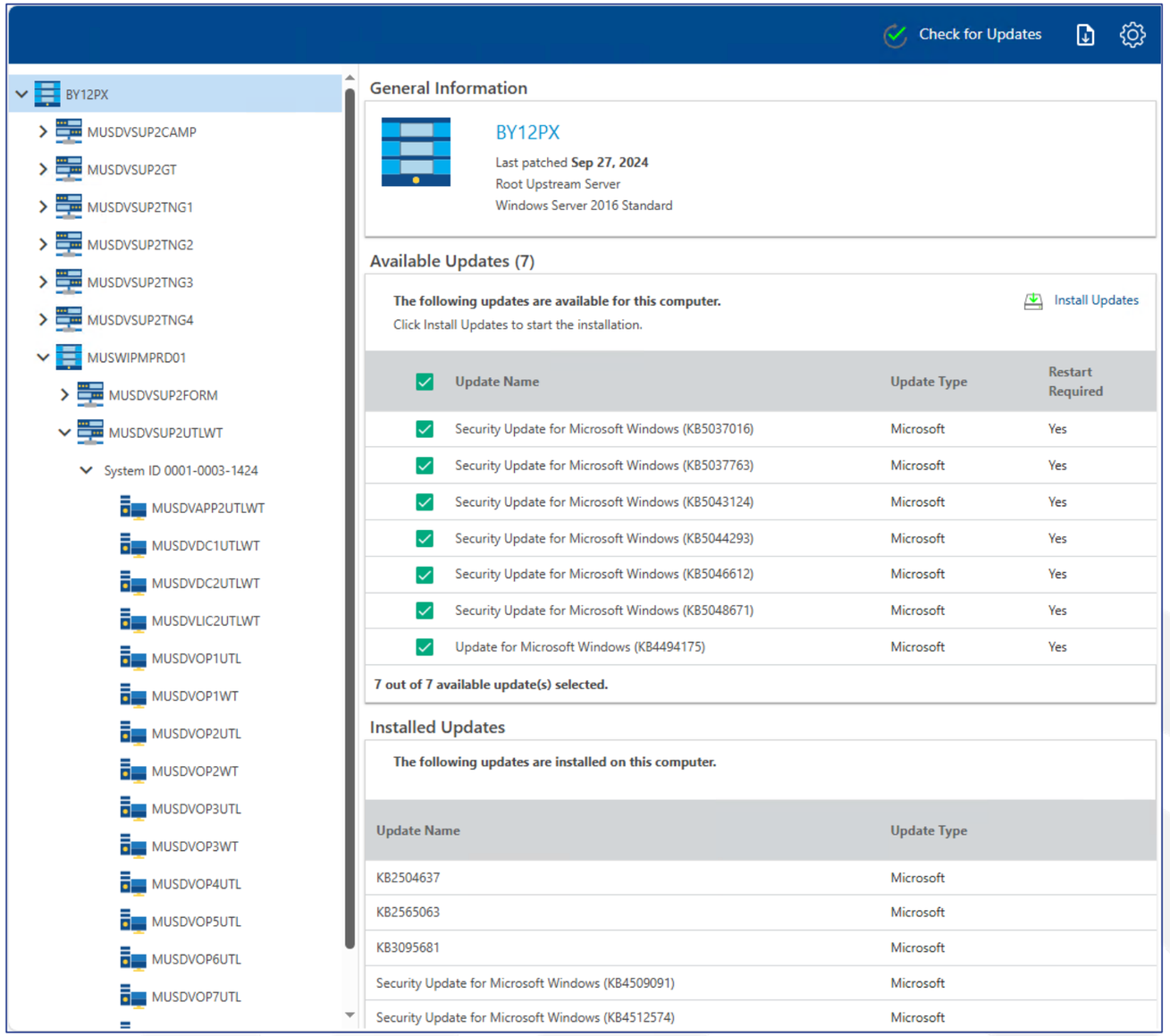
IPM User Interface

- Available Microsoft Updates
- DeltaV Hotfixes
- Antivirus Definitions
- Installed Microsoft Updates

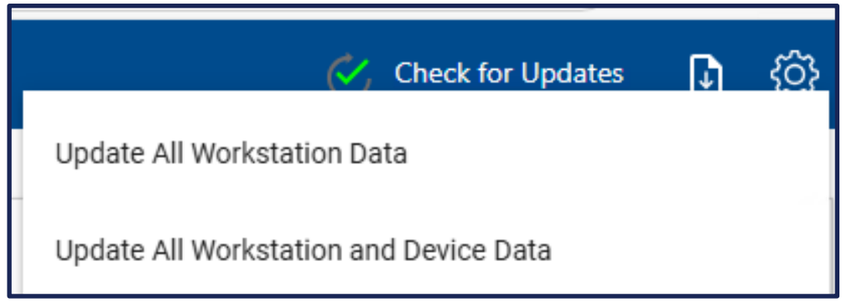


IPM Management Console

- IPM User Interface
  - Set User Preferences for IPM operations
  - Trigger the updating of IPM data
  - Monitor Installation Results
  - Audit Installed Patches
  - Install updates
  - Restart Workstations
  - Export Basic Data



Emerson Interface



- Different IPM Data Triggers:
  - Request down to workstations and devices
    - **Update All Workstation and Device Data (UAWDD):** Collect all Workstation data and devices that are connected to the server (devices include all DeltaV hardware, such as CHARMS, DV controllers, etc.).
    - **Update All Workstation Data (UAWD):** Collect only workstation data of all clients that are connected to the server.
  - Request up to Emerson and then transfers identified updates to each workstation
    - **Check for Updates:** Identify the available updates for each workstation in the IPM system tree. This action also deploys the software updates to each workstation (transfers files).

Method of Installing the Microsoft Patches

Shane
PC System Lead

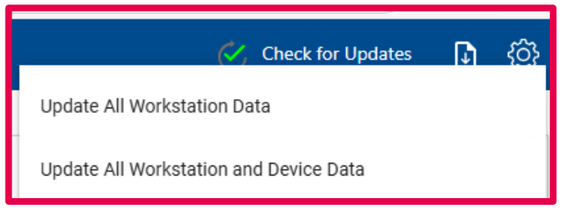
- ‘Update All Workstation Data’ (UAWD)
- ‘Check For Updates’

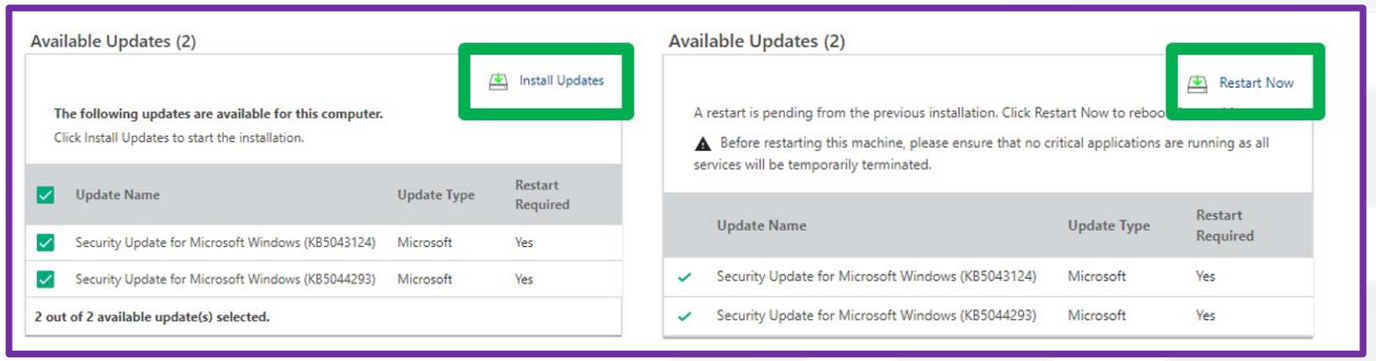
Josh
Process Control

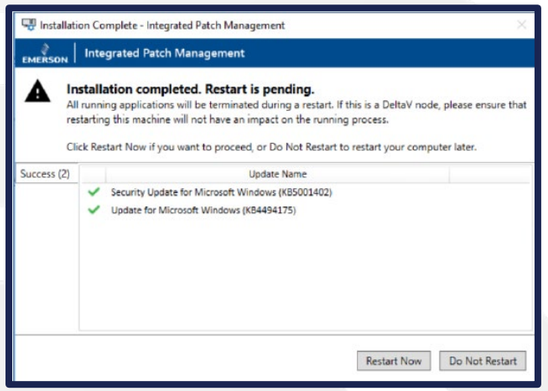
- ‘Install Updates’
- ‘Restart Now’

Mike
Operator

- Acknowledges Good Time to Restart
- Logs into Workstation after restart

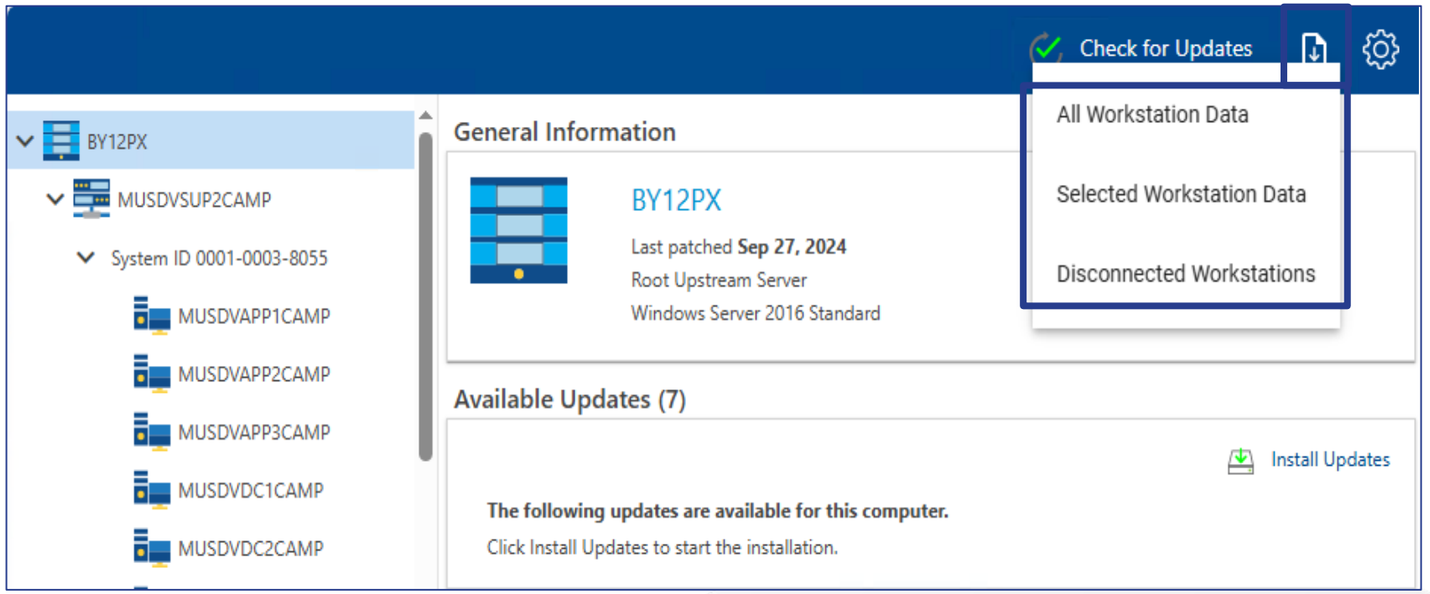






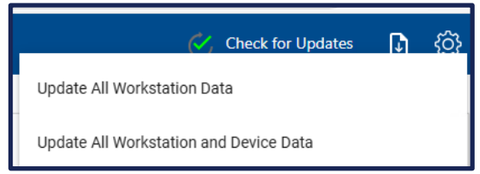
Exporting Basic Reports

- IPM Export Report Options:
  - All Workstation Data:
  - Selected Workstation Data
  - Disconnected Workstations



- Note: *Future Enhancement could be to create KPI reports of the patching status.*

IPM Configuration Files



- Depending upon the size of the IPM system, data collection timeouts will need to be set in order to collect all of the Workstation and Device Data.
- Information from Emerson's IPM Installation and User Guide v.1.4 (D800139X112 – July 2024)
  - Device and Data Collection:

During Emerson test simulations, the average time for data collection for the following devices were as follows:

- CHARMs: ~ 1.3 seconds
- CIOC: ~3 seconds
- Controllers: ~1 second
- Traditional IO Card: 4 seconds
- PK Controller I/O Card: ~2 seconds
- DeltaV Stations: ~8 seconds

The guides for adjusting the timeouts for an IPM system in the User Guide were for a test system that contained 40 workstations, 10,000 CHARMs modules, and 20 controllers.

Update All Workstation Data between the Downstream Server and the ProfessionalPLUS Station took around **3 hours** to complete.

If you have multiple Downstream Servers, calculate the timeout per Downstream Server. Use the largest timeout to configure the data collection timeout setting for your entire Integrated Patch Management system. All other Downstream Servers with lower timeout should be able to complete data collection within the largest calculated timeout.

  - Downloading of Software Updates: (Default = 2 minutes)

- Bayer Muscatine's Timeout Values are the following: (Note: Muscatine has 99 Workstations, >15,000 CHARMS, >70 Controllers)
  - Bayer Muscatine Device and Data Collection: Timeout > 16.5 hours Typical Time ~ 15 hours
  - Bayer Muscatine Downloading of Software Updates: Timeout > 6.5 hours Typical Time ~ 6 hours
- Note: *Previous versions had issues with Large Systems. IPM v.1.4 enabled simultaneous Downstream Server collection.*

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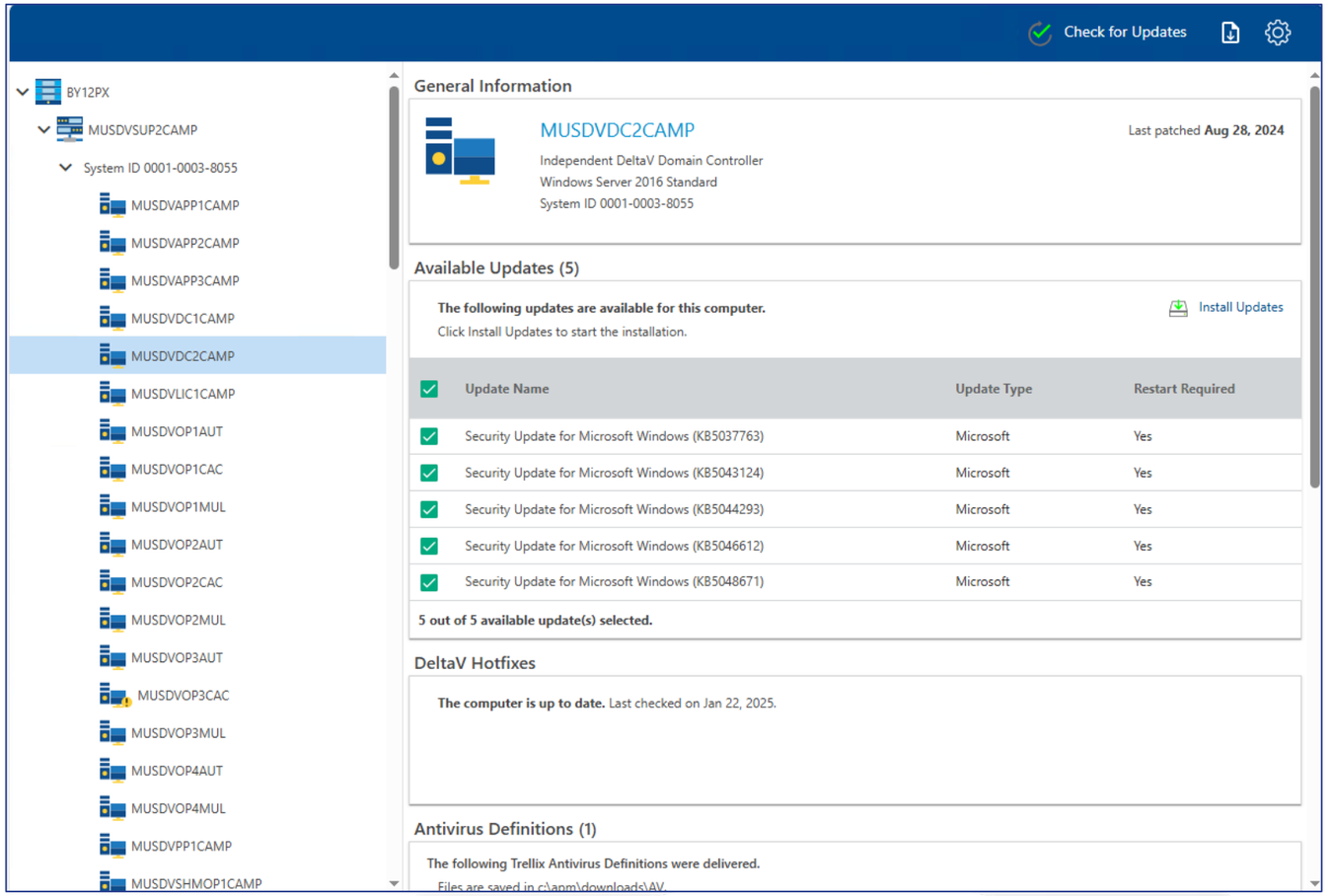
Results Achieved with Integrated Patch Management (IPM)

IPM Enhancement Ideas

- Ability to trigger a remote reboot without the logged in user of the workstation having Admin Privilege
- Automation of the annual web certificate updates
- Creation of KPI reports on overall install status
- Improvements around the handling of superseded Microsoft patches for non-DeltaV node workstations

- Note: *Attend the IPM roadmap presentation or visit the IPM exhibit booth for more details on the direction of IPM and planned IPM enhancements.*



Business Results Achieved

Control System Support Benefits Realized:

Improved DeltaV System Reliability:
Provides centralized location to determine what patches, AV, and DV hotfixes are installed and what are still needed. Easy access to Windows Operating System Information.

Improved IT and Security Compliance:
Makes compliance manageable and reduces vulnerability risks. Patches are now routinely and securely identified, distributed, and installed. Can easily demonstrate compliance during audits with IPM

Improved Productivity of Process Control Members:
Saving > 500 Hours/Year

Improved Sharing of Information:
Microsoft Patching became system based, since entire Process Control Team has access and visibility to site DeltaV patching status.

Results:

Microsoft Patching process is streamlined, installation frequency is higher, systems are more secure, and team efficiency is higher when utilizing DeltaV Integrated Patch Management (IPM).

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Exhibit #229 Guardian Software & Solutions / IPM

Find More Information

6-1600 Let Integrated Patch Management Help Make You More Cybersecure and Efficient

- Wednesday 10:15-11:00 AM

5-1703 Streamlining Cybersecurity: Air Liquide and DeltaV Integrated Patch Management

- Thursday 2:15-3:00 PM

3-1868 Patch in a Flash! Use DeltaV Integrated Patch Management to Quickly and Securely Patch Your System

- Tuesday 1:15-2:00 PM, Wednesday 1:15-2:00 PM

MTE-1907 Are you Ready for the Future of Industrial Cybersecurity?

- Wednesday 9:15-10:00 AM, Thursday 3:15-4:00 PM

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Thank You