



SUMMARY

Dell EMC

Industry

Critical Facilities, Data Centers, IT

Business Value

- IIoT
- Business Intelligence
- Operational Visibility
- Performance Optimization

PI System™ Components

- PI Server™
 - Data Archive
 - Asset Framework
- PI Connector for Redfish
- PI Interface for Modbus
- PI Vision™

How the PI System Enables Edge Computing Virtually Anywhere

Dell EMC, a part of Dell Technologies, enables organizations to modernize, automate, and transform their data centers using industry-leading converged infrastructure, server, storage, and data protection technologies. This provides a trusted foundation for businesses to transform their IT and their business with cloud applications and big data solutions. As Tyler Duncan, Technical Staff at Dell EMC, presented at the 2017 OSIsoft Users Conference, engineers at Dell EMC and OSIsoft are working to make data centers that enables edge computing more modular, more intelligent, and easier to manage.

The Challenges of Unmanned Data Centers

Dell EMC's Micro-Modular Data Centers (Micro-MDCs) let service providers scale compute resources in a manner that's agile and fast. This new breed of unmanned data centers can be deployed just about anywhere. They allow service providers to place Micro-MDCs near areas of internet activity instead of building out one centralized unit. Service providers can see massive performance improvements while creating new revenue opportunities.

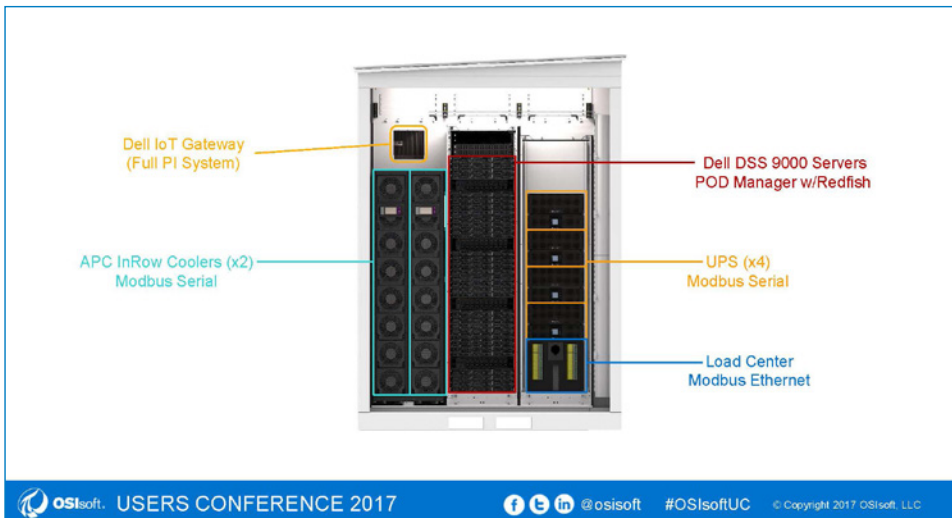
Modern data centers have a tremendous amount of telemetry that exposes the health of everything from the cooling equipment and backup batteries to the temperature of a server. This explosion of sensors is a double-edged sword: there's more information available for troubleshooting, but it quickly turns into a data management problem. "The challenge is with IoT there are more devices, more data, and it's growing at an exponential rate," said Tyler Duncan.

The traditional approach is to collect health data from remote data centers and send it to a central location for analysis. However, sending all of the data all of the time consumes too much bandwidth and doesn't scale up well. "The enterprise is no longer looking at the data center, it's looking at the world as the system," said Duncan. "We want to monitor the entire enterprise, to show the IT and facility infrastructure around the world." Dell EMC Operations engineers need to drill down multiple levels into a data center, a group of servers, a single server, and even a single rack. They also need to view individual readings in the power and cooling infrastructure. To do this, the management solution must be easy to deploy, easy to maintain, and automated.

Intelligently Monitoring Remote Assets

Dell EMC and OSIsoft built a proof-of-concept system in which the PI System monitors the Micro-MDCs. The first challenge was collecting information from both the IT assets (computers/servers) and the OT/facilities assets (cooling and power supplies). The PI Connector for Redfish collects data from the Micro-MDC's servers, and "allows us to be able to search for all the servers on a particular network, automatically bring them in,

and have the data all populated in an automatic way,” said Duncan. The Redfish protocol is a vendor-agnostic solution for reading data off servers and is used for rack-level management. Similarly, the PI Interface for Modbus collects data from the Micro-MDCs’ power and cooling components. PI Connectors in each Micro-MDC relay a copy of the data to a PI Server at Dell EMC Data Center Management Operations.



“The OSISOFT connector allows us to be able to search for all the servers that are on a particular network, automatically bring them in and have the data populated in an automated way.”

– Tyler Duncan
Technical Staff

Another challenge was that resources on the Micro-MDC are reserved for the service provider, not the company that’s monitoring them. The solution was to place a Dell 5100 Edge Gateway inside the Micro-MDC. The Dell 5100 is small enough to mount on the cabinet wall and powerful enough to run the full PI Stack. It puts high-end computational and analytics capabilities live at the edge, making it possible to run mission-critical applications without lag. Pushing analytics to the edge also makes it cost effective to monitor large numbers of data streams instead of relaying all the data to a central data center.

The OSISOFT infrastructure provides visibility into asset health and can monitor both the IT and the OT infrastructure through a single application, PI Vision¹. PI Vision provides a scalable “single pane of glass” through which all telemetry information from the Micro-MDCs can be viewed. To make this system easy to maintain, all displays and dashboards rely on a common underlying template. The end result is a set of displays that are consistent and easy to use when viewing Micro-MDCs from anywhere in the world.

Lower Bandwidth, No Data Silos

By leveraging the OSISOFT infrastructure along with Dell edge gateway hardware, Dell EMC can take the power of the PI System to wherever Micro-MDCs are needed. The PI System provides the connectivity, analytics, and client tools needed to simplify the management of dispersed remote assets. The combined impact is that Dell EMC and OSISOFT are making data centers more modular, more intelligent, and easier to manage.

¹ PI Coresight was renamed to PI Vision in 2017.