

OSIsoft. USERSS CONFERENCES The Power of Data

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HP Containerized **Data Center** Infrastructure **Monitoring Solution**

Presented by HP IT Global Data Center Services: Automation Rovisys



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Agenda

- Introduction
- Background: POD Definition
- Business & Technical Requirements
- PI System Architecture
- Monitoring & Notifications
- Mobile Architecture

Introduction

Members

- HP
 - Matthew Brown
 - T.J. Eason
 - Erick Levitre
- Rovisys
 - Brian Polaski

Hewlett Packard

- HP-IT Global Data Center Services: Automation
- End-User Organizations:
 - Facilities
 - DC Operations
 - IT Operations
 - Enterprise Services

Environment

- Six data centers in three different cities
- Monitoring over 475,000 sq. ft. of DC Space and nearly 50+ MW of provisioned critical load

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Background

Performance

Optimized

Data Center

Benefits:

Efficient Design

- Reduce Energy Usage
 Abundant capacity
- Reduce Footprint
 Quick Deployment
- Condensed lead time

Reduced Costs



Models: HP POD 20c (290kW) HP POD 40c (450kW) HP POD 240a (2,304kW)

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Business Requirements

Objective

 Converge next generation POD with brick & mortar data center regarding infrastructure monitoring and notification

Drivers

- Increase awareness of next generation environment
- Reduce initial response time for equipment issues
- Integrate with formal monitoring and support policies
- Drive operational efficiencies with real time, role-based data

Technical Requirements

Objective

 Unify data across both the POD ECS and the Building Automation Systems

Drivers

- Provide reliable, stable, scalable solution
 - -Thin Client, Web based
 - -Virtualized Infrastructure
- Provide high availability architecture
 - Multi-member collective with Active/Active Interface Nodes
- Provide robust analytics and reporting
 - Custom Calculation Engine
- Provide mobility for field technicians & DC operators
 - Mobile PI hardware

OSIsoft Architecture Overview

Visualization Layer	 Users login to Citrix using NT credentials to access Process book and Active view client
Mobile PI Layer	 Web Servers allow Mobile PI application to sync with system provide mobile users access
PI System PI Server Status Calculation SharePoint Web Server AF Server	 Utilizing PI 2010 Components Built with Redundant Architecture
Interface Layer NGDC NGDC NGDC RCS Core Austin Houston Atlanta DC	 Total of 30 interface nodes between six data centers Monitoring over 1million digital and analog points Collecting approx. 1.25 TB of data per year

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Expanded EPMS Architecture

- Global Load Balanced for Citrix, Mobile PI, SharePoint, Web, AF
- Redundant pair for each member
- Syncs with DB Cluster (SQL 2008)
- Run on virtual instances



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Monitoring the POD

Monitoring Elements

- Power
- Cooling
- Control & Safety System
- Leveraged OSIsoft Components
 - AF
 - Visualization
 - Custom Calculation Engine
 - PISDK
 - AFSDK
 - PI-API
 - PI Notifications



6 ROVISYS Nap Preulous Screen Atlanta 5 - EcoPod 1 Overview Fan 6 Fan 4 Pod PUE: 1.43406 Fan 8 Fan 2 Entire PUE: **DX B12** DX 811 Fan 1 an 10 A-Side Rack PDU **DX B10** DX B9 DX B8 DX B7 Fan 9 Fan 3 DX B6 DX B5 Fan 7 Fan 5 **B-Side Rack PDUs** DX B4 DX B3 DX B2 DX B1 **DX A12** DX A11 **DX A10** DX A9 DX A8 DX A7 DX A6 DX AS DX A4 DX A3 DX A2 DX A1 louse Power A louse Power B **ECS Holding/ECS Status ITA Starline Power ITB Starline Power DXA Power System DXB Power System**

AF Device Modeling

Template-Based Assets Area centric Tree Structure

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AF Device Modeling

Template-Based Assets Area centric Tree Structure



Visualization

Citrix Server hosts visualization

- Processbook
- Activeview

Asset-based Screen Navigation



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Custom Status Calculation

- Individual alarming per device attribute
- Alarm suppression via Maintenance Mode
- Notification-based alarming per device
- Custom Delivery Channel provides in depth alarm details



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PI Notifications

- Standard Notification Groups
- Escalation Groups
- Custom Delivery Channel
- Custom State Groups to allow proper criticality alarming
- Web Report for viewing & acknowledgement
- Maintenance Mode
 - Accessible from Graphics
 - Web based report for mass maintenance mode



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HP Datacenters Notificat	tions Viewe	r			retrievir	ng notification
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	Results.	ort		
Current Status	Status¢	Device Name	Location	Details
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Atlanta 5 ECOPOu		SWA01ECS1AMMU1	SWA01EcoPodSys1\ SWA01ECS1_UPSA\ SWA01ECS1AMMU1	n/a
Device Type:		SWA01ECS1AMMU2	SWA01EcoPodSys1\ SWA01ECS1_UPSA\ SWA01ECS1AMMU2	n/a
All		SWA01ECS1AMMU3	SWA01EcoPodSys1\ SWA01ECS1_UPSA\ SWA01ECS1AMMU3	n/a
Load Devices		SWA01ECS1AMMU4	SWA01EcoPodSys1\ SWA01ECS1_UPSA\ SWA01ECS1AMMU4	n/a
		SWA01ECS1BATS	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BATS	n/a
		SWA01ECS1BMMS	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BMMS	n/a
		SWA01ECS1BMMU1	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BMMU1	n/a
		SWA01ECS1BMMU2	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BMMU2	n/a
		SWA01ECS1BMMU3	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BMMU3	n/a
		SWA01ECS1BMMU4	SWA01EcoPodSys1\ SWA01ECS1_UPSB\ SWA01ECS1BMMU4	n/a
Options Historical Report		SWA01ECS1DXA01	SWA01EcoPodSys1\ SWA01ECS1_EcoPod\ SWA01ECS1_DXASys\ SWA01ECS1DXA01	n/a
		SWA01ECS1DXA02	SWA01EcoPodSys1\ SWA01ECS1_EcoPod\ SWA01ECS1_DXASys\ SWA01ECS1DXA02	n/a
		SWA01ECS1DXA03	SWA01EcoPodSys1\ SWA01ECS1_EcoPod\ SWA01ECS1_DXASys\ SWA01ECS1DXA03	n/a
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Mobile Pl

Network Security

- SSL Secured with 2048-bit keys
- HP Secure Reverse Proxy Authentication

• Development Tools

- ASP.NET (C#)
- SQL
- jQuery Mobile
- HTML5/JavaScript/CSS3

Leveraged OSIsoft Components

- PI Server
- AF (Status and Data Roll up Calculations)
- Cloud Infrastructure





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Mobile PI Demo





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