



Facilities & Energy Management

Presented By: Brian Polaski
Facilities Manager

Who is RoviSys?

- RoviSys performs system integration
- Core Strengths
 - Process Automation
 - Building Automation
 - IT Infrastructure
 - Big Data Analytics
 - Custom Software Development
- Incorporated April, 1989

ROVISYS

ROVISYS
BUILDING TECHNOLOGIES

ROVISYS

Globally Located



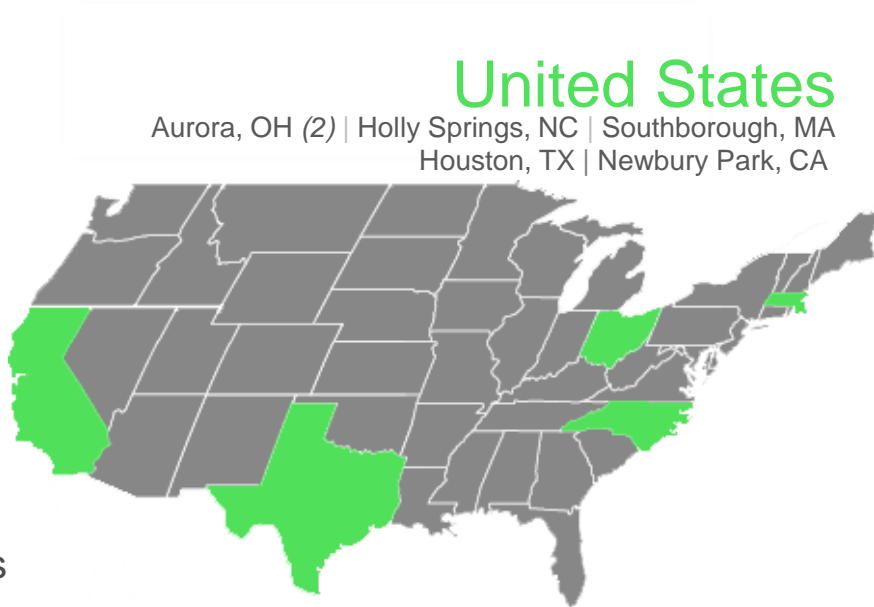
10
Locations



11
Industries



600+
Employees



Europe



Netherlands | Luxembourg

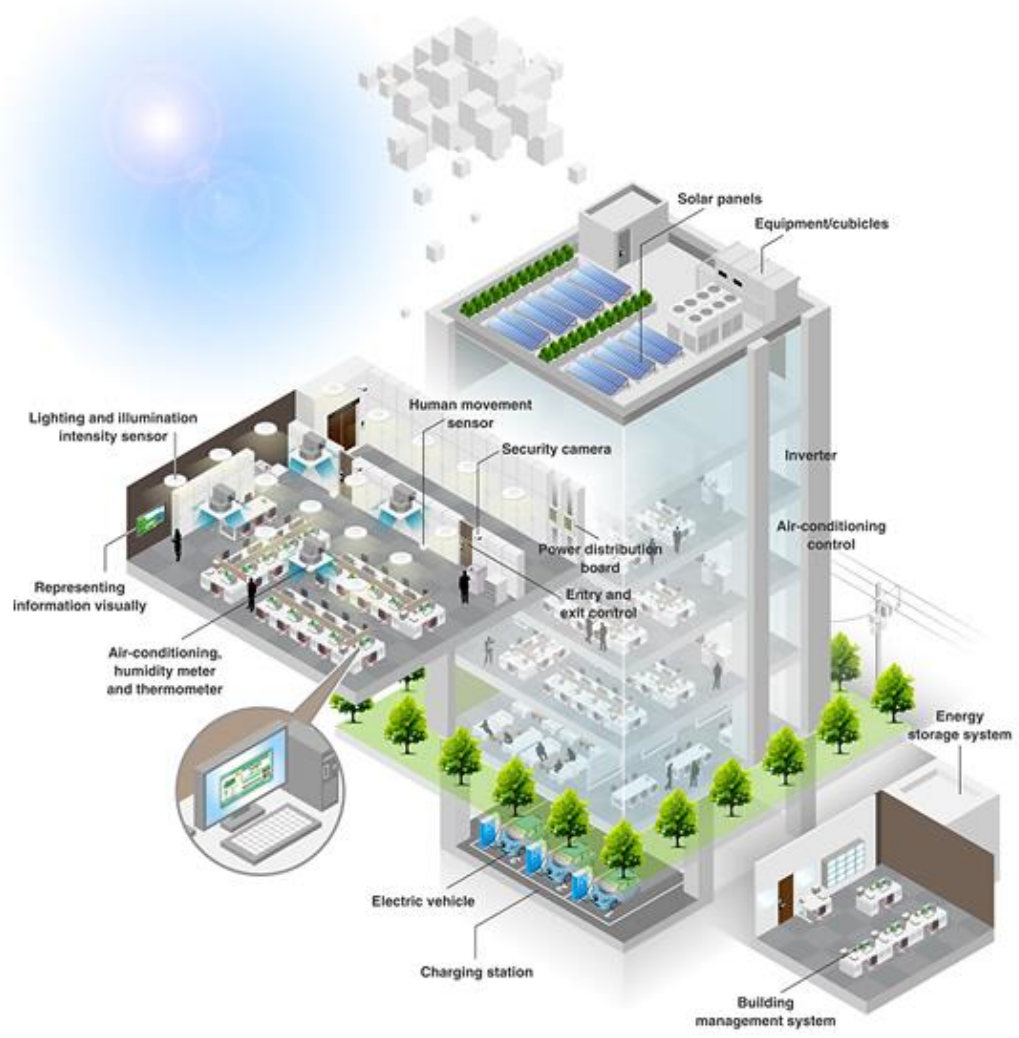
Asia Pacific



Singapore | Taiwan

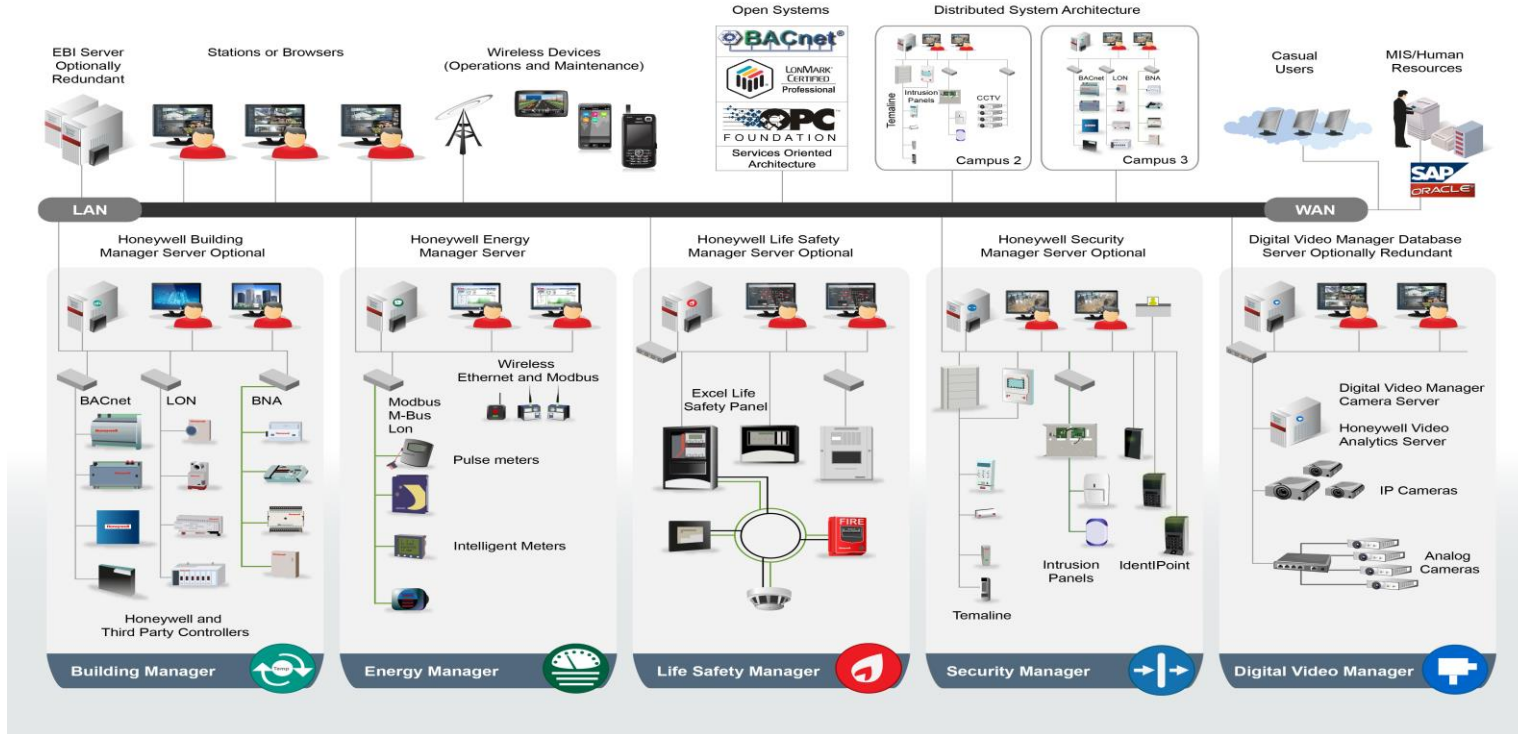
Agenda

- Makeup of a facility
- Facility Challenges
- Single Pane of Glass Solution (SPOG)
- SPOG Energy Management dashboards
- Q&A



Sample Integrated Building System Architecture

Courtesy: Honeywell (All Systems)



Typical Disparate Systems



Honeywell



**Rockwell
Automation**



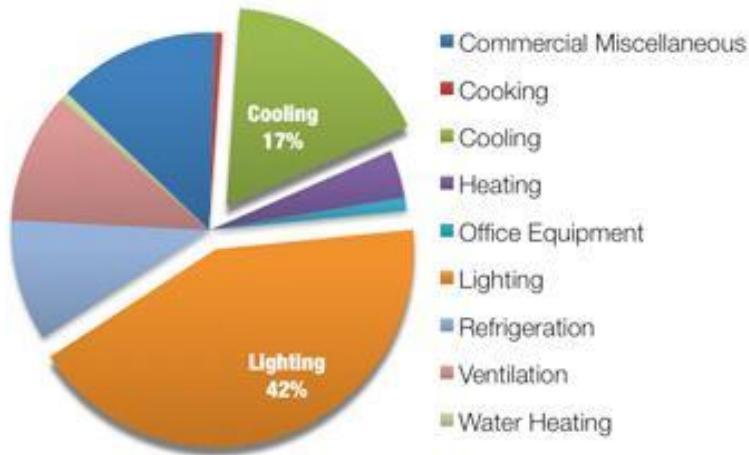
EAT•N

Cutler-Hammer

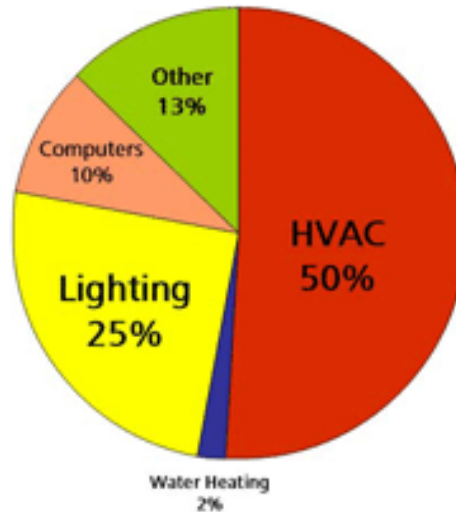


Building Systems Energy Use

SCE Commercial Building Energy Usage



Energy Usage in Commercial Buildings

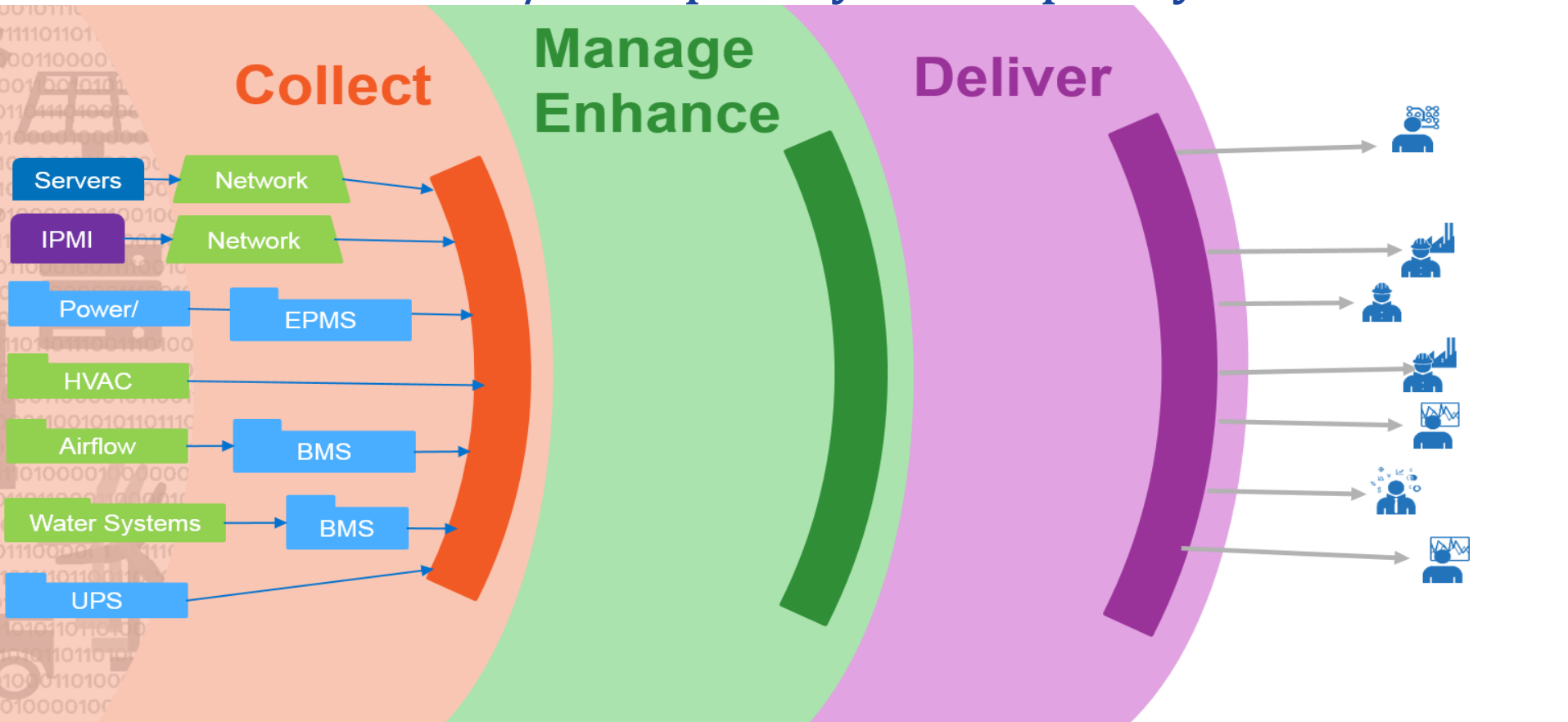


The Challenges with Monitoring

- Limited data scalability
- Struggle to aggregate the data for a complete picture of operational integrity
- Unable to determine the utilization of the facility assets
- Difficult to measure the efficiency of the facility assets
- Trouble monitoring and reporting customer/business usage individually
- Unusable Alarming & Notifications

Traditional Strategy

Silos to Standards / Complexity to Simplicity



Enabler of the “Single Pane of Glass”

Collect

Manage
Enhance

Deliver

Servers

- PI System scales to handle high volume and high transaction rates

IPMI

- Provides easy and relevant access to data for each level of the business as well as to various roles within the organization

Power/

- Breaks down the silos of information to improve business operations

HVAC

- Custom Alarming

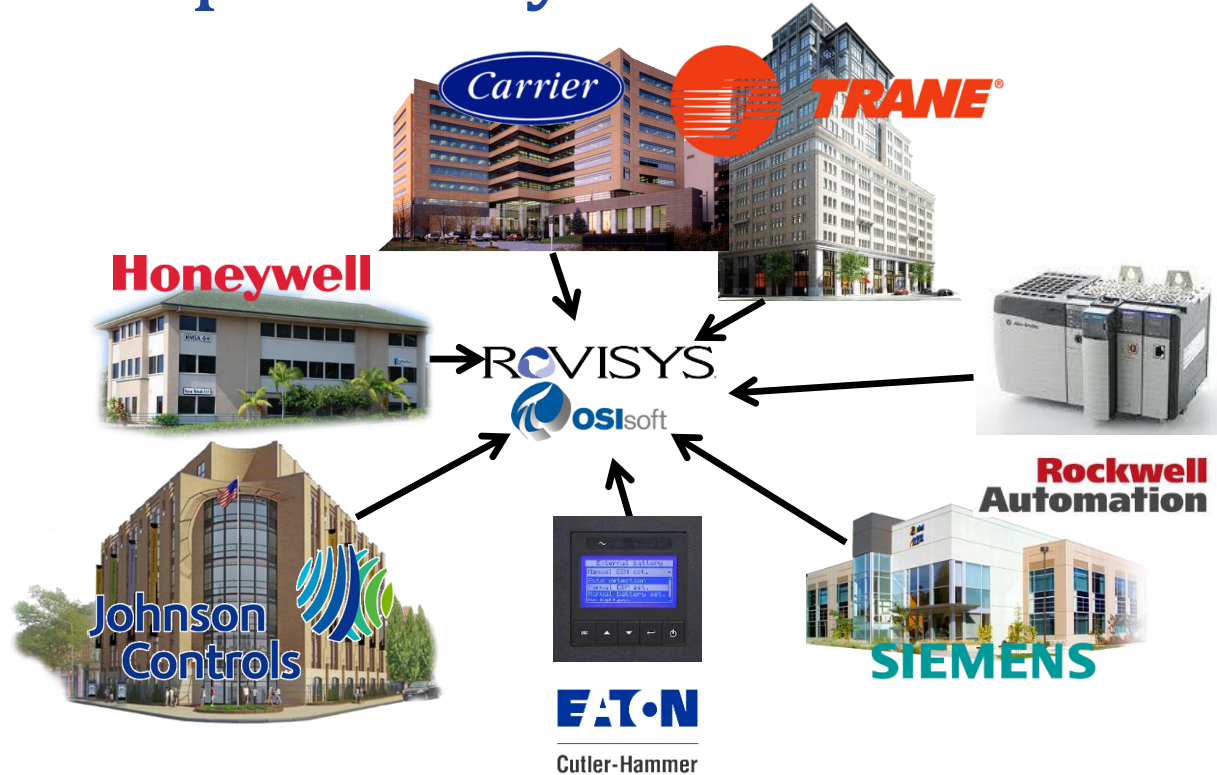
Airflow

- RoviSys Industry and PI System Infrastructure integration experience

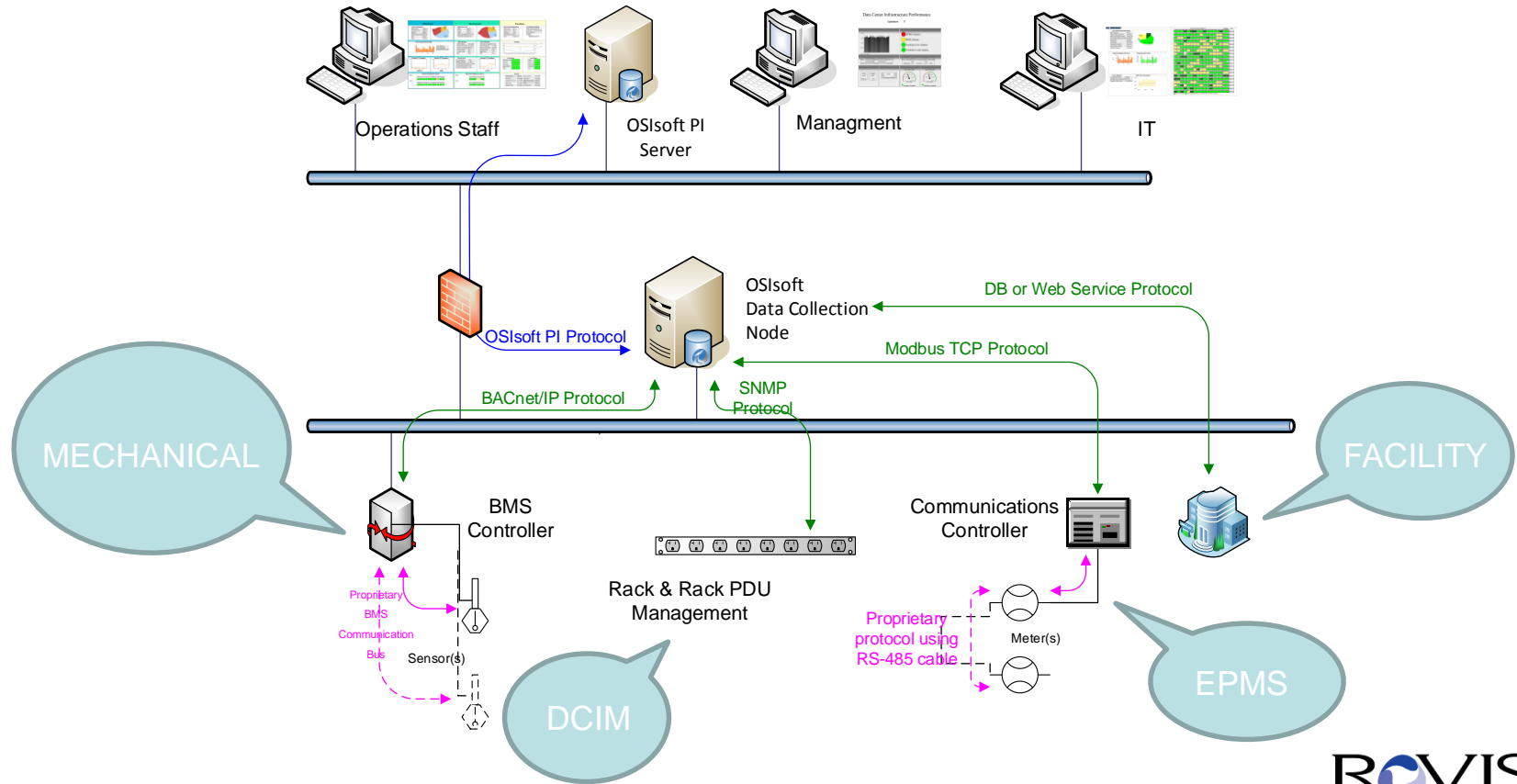
Water System

UPS

SPOG Disparate Systems Solution



SPOG Architecture



Templates w/ Analytics

Device / System Examples:

RPP

- Breaker Utilization
- PUE

UPS

- UPS Efficiency

PDU Strip

- Outlet Utilization
- Stranded Capacity

Rack

- Power Density
- Capacity

Electrical

- Power Consumption
- PUE
- DCiE

Utility Totalizers

- Power Meter
- Gas Meter
- Water Meter

Mechanical

- Daily total – cooling tower make-up water
- Chiller plant total thermal load – KW & tons
- Server floor air temperature & RH – average

Single Pane of Glass

COLLECT
Dataources

Templates
Asset Information

Analytics
Performance & Alarming

DELIVER
Info to the Right People

PDU Strip



Real-time data:

Parameters

Strip Total Current

Strip Total Power

Strip Voltage

Power / Outlet

Current / Outlet

Voltage / Outlet

Asset Data:

Server Info

Server Name

Max Power

Idle Power

Serial Number

DCIM
Database
Excel



Analytics

PDU Strip
Outlet % Utilization

Rack
Power Density
Avg. Capacity Utilization
Rack Temperature

Rack Grouping
Avg. Power Density
Avg. Capacity Utilization
Rack Temperature

Strip Name	Strip Model	Serial Number	Asset Class	Power Load	Status	Max power	Utilization %
CM01	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM02	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM03	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM04	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM05	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM06	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM07	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM08	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM09	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM10	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM11	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM12	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM13	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM14	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM15	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM16	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM17	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM18	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM19	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%
CM20	AP0110-000000000000	1001100000000000	Strip	450 W	OK	450 W	11.1%



Status	Location	Notification Alarm	Trigger Time	End Time	Description
Active Alarm	IT Department-001	A/A: A critical error has been detected in the...	2013-07-10 10:00		
Active Warning	IT Department-001	A warning has been detected in the...	2013-07-10 10:00		
Clear	IT Department-001	A/A: A critical error has been resolved in the...	2013-07-10 10:00	2013-07-10 10:00	Action logged
Warning	IT Department-001	A/A: A warning has been detected in the...	2013-07-10 10:00	2013-07-10 10:00	Action logged

Single Pane of Glass

Atlanta5 SWA01ECS1DXB11 has a critical alarm - Message (HTML)

From: osisoftnotifications2@hp.com
 To: Maxwell, Jason
 Cc:
 Subject: Atlanta5 SWA01ECS1DXB11 has a critical alarm

Sent: Fri 3/16/2012 8:08 PM

Start Time: 3/17/2012 12:07:39 AM
Target: Atlanta5\SWA01EcoPodSys1\SWA01ECS1_EcoPod\SWA01ECS1_DXBSys\SWA01ECS1DXB11
Escalation Level: 0

Attributes in alarm:
 Atlanta5.SWA01ECS1DXB11.SBMSDXLowPressureAlarm HIHI Limit = ALARM Trigger Time Value = 1

[Acknowledge with comment](#)
[View Alarm Status Trend](#)

Facilities

Environment Monitoring

Avg Water Temp	56 °F	Natural Gas	709 CCF
CUE	2.853	CO2	
Server Room	86 °F	Water	2.3885 US Mgal

Utility Meters Readings

Humidity

Line graph showing humidity levels over time (3/9/2017 2:56:23 PM to 3/16/2017 2:56:23 PM). Y-axis ranges from -10 to 60. Legend: Inside (42.8%), Outside (65.2%).

Fire Alarms

Equipment Room	Green	Chillers	Green
Data Hall	Green	CRACS	Green

Leak Alarms

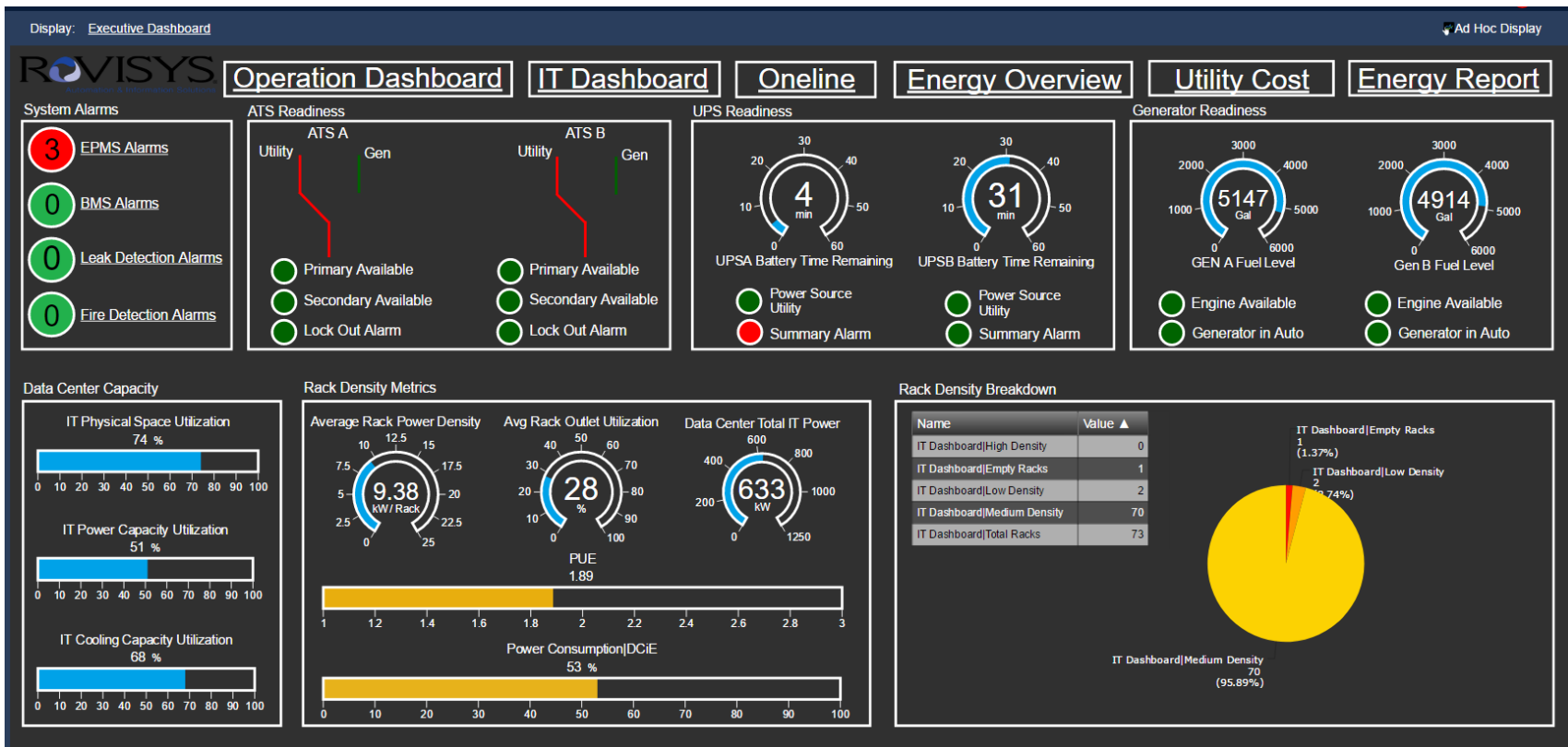
Chillers: Green, CRACS: Green

Electrical Equipment Alarms

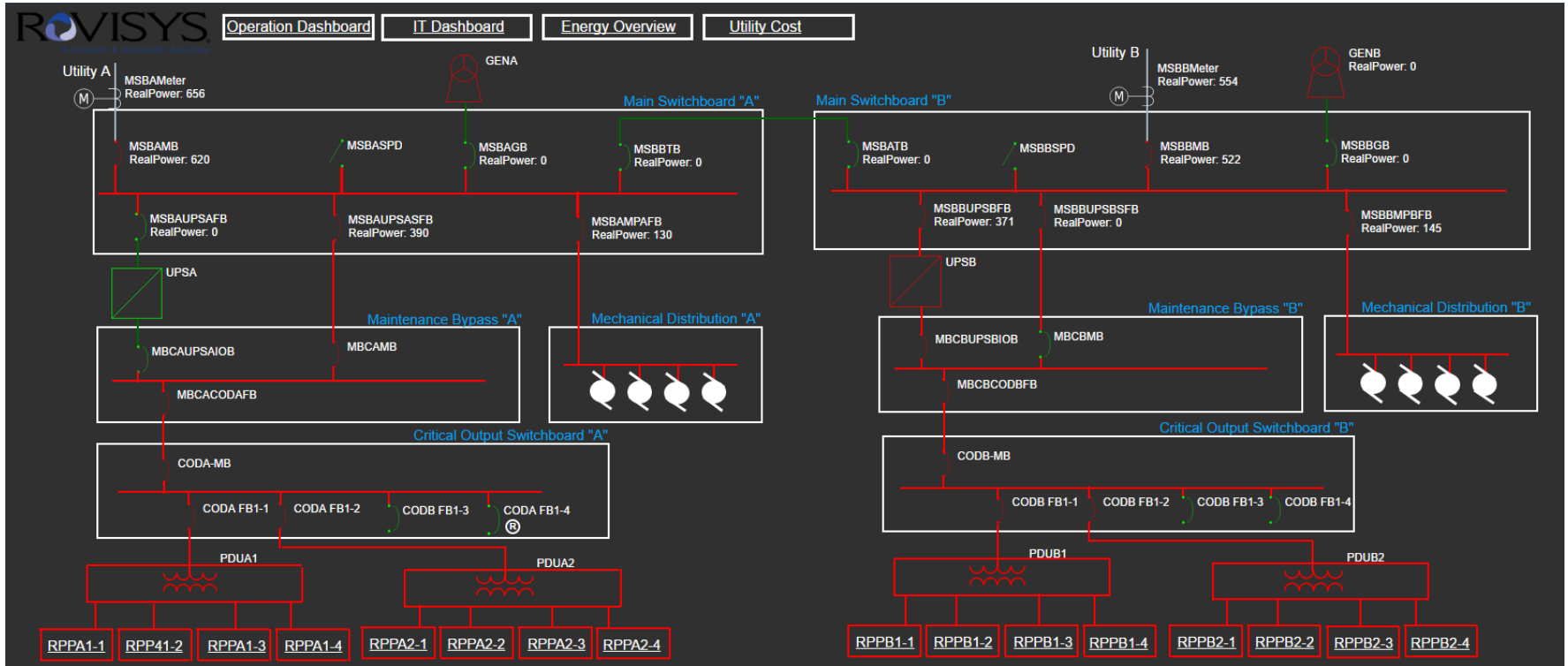
Side	GEN	MSB	ATS	UPS	PDU	RPP
Side A	0	0	0	1	0	0
Side B	0	0	0	0	1	1

Bottom status bar: 3/9/2017 2:56:23 PM | 6d 23h | Now | 3/16/2017 2:56:23 PM

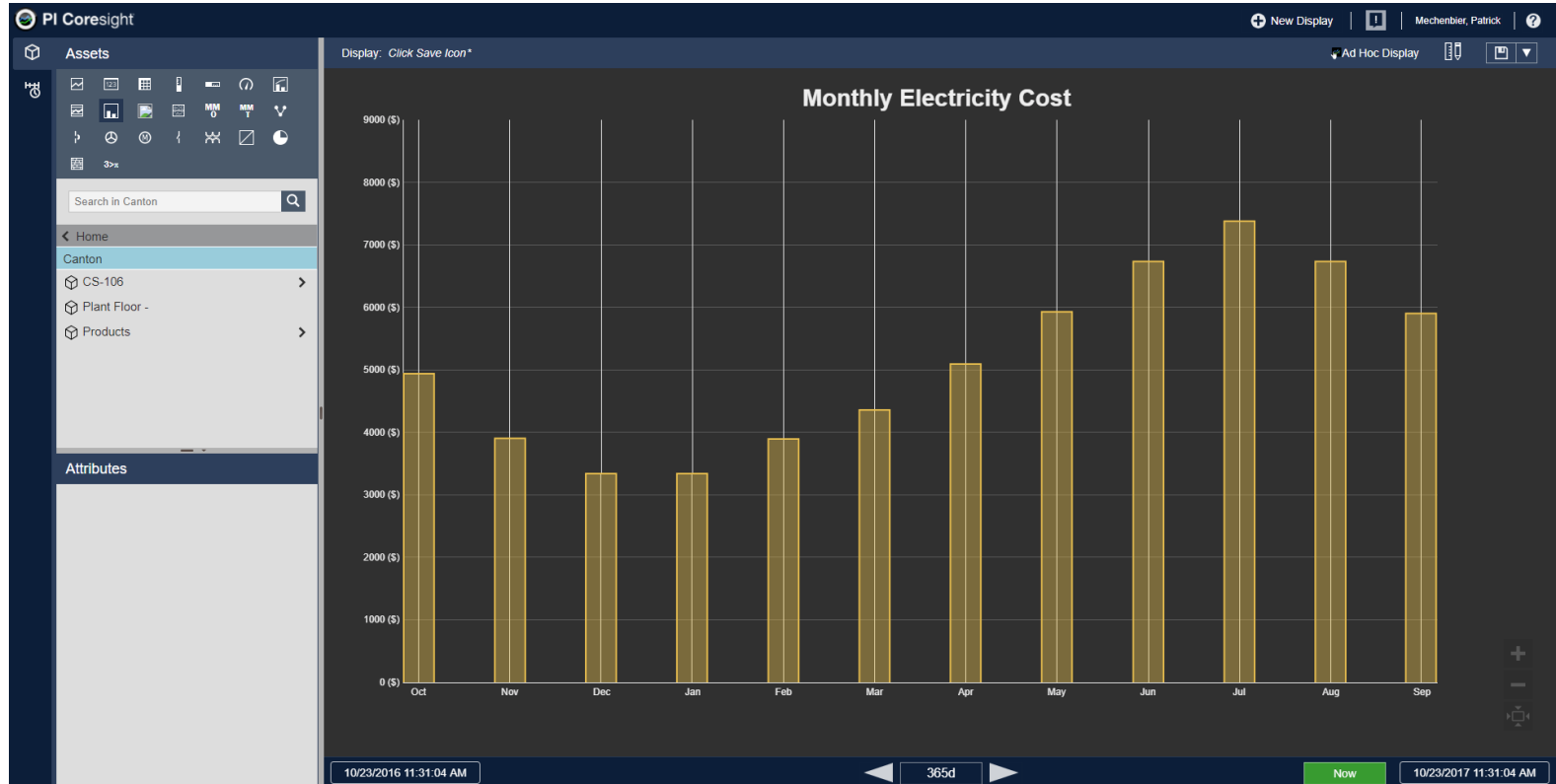
Executive Dashboard



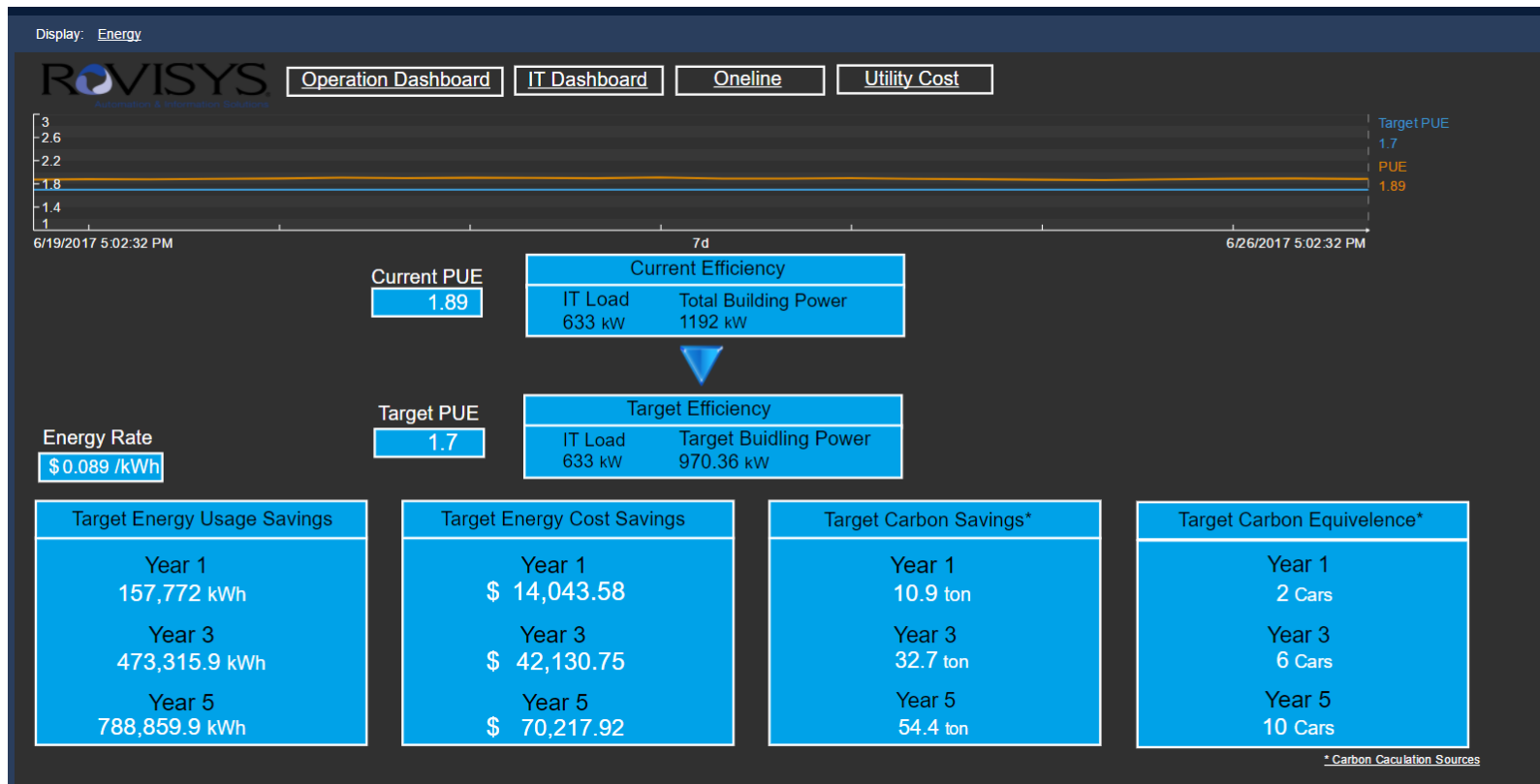
One-Line Diagram



Utility Billing



Driving Efficiency



Conclusion

- Typical facility architecture consist of disparate systems
- Energy Management is big opportunity to save \$\$\$
- OSIsoft provides the foundation for the SPOG
- SPOG provides insight about your information
- Difficult to improve without first monitoring

Thank You!

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