

High performance. Delivered.

**Green Data Centers & The Data Center Dashboard** 

**OSIsoft User Conference 2009** 

# Agenda

- Our Understanding
- Green IT and Green Data Centers
- Green Technology Suite
- Why Measure?
- Our Joint Solution Accenture & OSIsoft
- How to Justify the Business Case
- Demo

#### It's a business decision that has environmental impact

#### Green data centers are not keys to solving the total environmental problem

 Estimate that data centers account for 1.2% of the total electricity consumed in the U.S. (equivalent to that used by TVs), and 0.8% worldwide in 2005

### BUT Green Data Centers are necessary to meet business demands AND deliver considerable environmental impact

- Provide the compute capacity for larger sustainability initiatives (e.g., online collaboration)
- Offer key opportunities for carbon neutral savings
  - Typical data centers use 10-15 times the electricity of a typical office building on a square foot basis
  - Data center electricity use is comparable to that of manufacturing industries

"[Data Centers] can use 100 times the electricity of a typical office building on a square foot basis. Energy costs of \$1 million per month are not uncommon in large data centers that require megawatts of electricity."

–William Tschudi, Lawrence Berkeley Lab principal investigator

Industry (North American Industry Classification System Code)	Electricity use (billion kWh/year)	
Chemical manufacturing (325)	151	
Primary metal manufacturing (331)	137	
Food manufacturing (311)	79	
Paper manufacturing (322)	75	
Plastics and rubber products manufacturing (326)	U.S. Servers &	
Transportation equipment manufacturing (336)	Data Centers 59 billion kWh/year	
Fabricated metal product manufacturing (332)	53 billion kwillyear	
Petroleum and coal products manufacturing (324)	49	
Nonmetallic metal products manufacturing (327)	46	
Computer and electronic product manufacturing (334)	35	

## Either way you look at it, the value proposition of the Green Data Center is clear

## Business angle

#### Stay out of the red by being green

#### Reduces day-to-day operations costs

Unchecked energy consumption will grow to up to 50% of the IT budget

#### Prolongs the lifespan of existing data centers

Intelligent refresh extends the lifespan of the existing data center: Build out a new data center costs \$1000/sq ft and takes years, refreshing a data center requires only a fraction

### Takes advantage of pricing incentives, tax breaks, and rebates offered by utilities, insurance companies, and governments

- PG&E reimburses up to 50% of the costs of server consolidation projects, up to \$4M/customer
- In 2005, the Insurance industry paid a record \$57B in weather-related losses leading to Industry calls to curb Greenhouse Gas Emissions (e.g., Fireman's Fund provides insurance incentives for green buildings)

#### Prepares for regulation and certification

- Power use: Energy star certification and regulation likely to follow EPA study
- Waste stream management: WEEE and RoHS are European directives that restricts electronic waste

### Green angle

#### Bestows benefits for being a good corporate citizen

## The Solution: Changing the way we meet IT demands

Beyond the reduction delivered by facilities and technology, other data-center related initiatives can and should be explored

#### **Smart Redundancy**

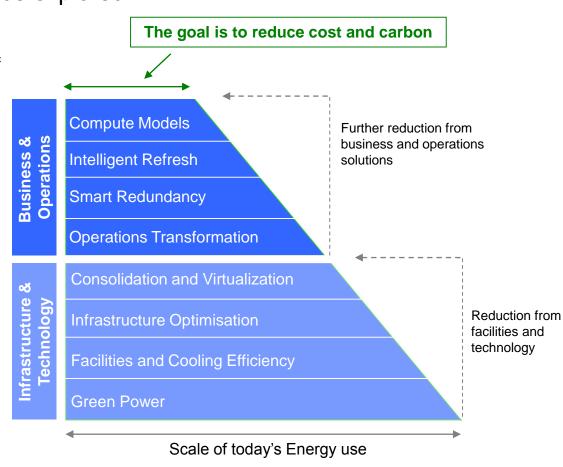
Examines how availability and continuity of service is provided and drives out "redundancy on redundancy"

#### Intelligent Refresh

Looks to extend the infrastructure refresh cycle and ensures intelligent and sustainable approaches to procurement and disposal are used

#### **Facility Efficiency**

With up to 40% of energy not going to powering IT equipment, improving efficiency of cooling, power delivery and infrastructure can bring benefits



## A holistic view of the impact of IT on the environment

Rather than looking at individual initiatives, the Accenture Green IT Agenda takes a holistic view of the environmental footprint across an organisation's IT and highlights areas where action may be taken.

#### **Procurement**

The processes by which an organization purchases equipment, supplies and services

#### **Office Environment**

End user compute devices including desktops, laptops, printers and mobile devices



#### **Corporate Citizenship**

The way the IT organization interacts with the local, regional and global community

#### **Working Practices**

Concerned with the way an organisations IT is run including locations, process and structure

#### **Data Center**

An organizations share compute capabilities including servers, storage and network

## Accenture's Green Technology Suite

Accenture is the only one of 12 providers that is listed as providing a "full capability" in every capability from assessment, planning and implementation

Source: Forrester, "The Dawn of Green IT Services," March 2008

#### Vision-to-value

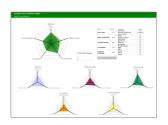
Holistic

**Vision PoV** 

**Estimators** 

**Dashboard** 

**Analytics** 



**Green Maturity Model** 



Data Center Forecast & PoVs



Data Center & Workplace Estimators



Data Center Dashboard & Smart Building



Data Center Analytics



"While metering alone does not save energy, the information from the meters, when acted on, can result in significant reductions — typically 5 to 15 percent"

Jean Lupinacci, Director, Commercial and Industrial Branch of Energy Star® U.S. Environmental Protection Agency (EPA)

## Measurement and Monitoring Why you should do it







#### Efficiency

- Cost-takeout
- Increased Reliability

#### Scalability

- Capacity Management
- Growing your business while minimizing data center expansion

#### Operational Intelligence

- Retrofit vs. build new data centers
- Prioritizing projects
- Situational Awareness

#### Multi-site Management

- Tracking your global carbon footprint
- PUE or DCiE computation

## Measurement and Monitoring Why you have to do it



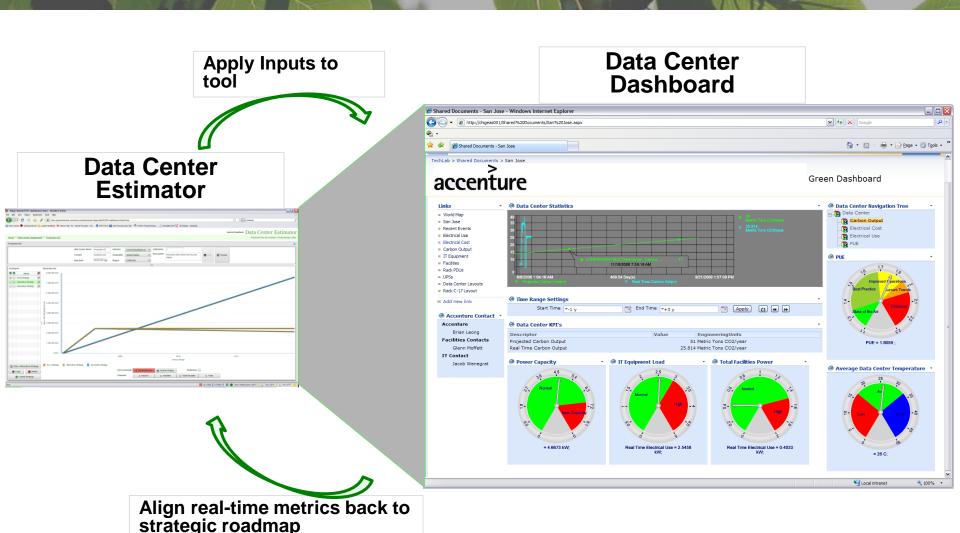


#### "Green credentials"

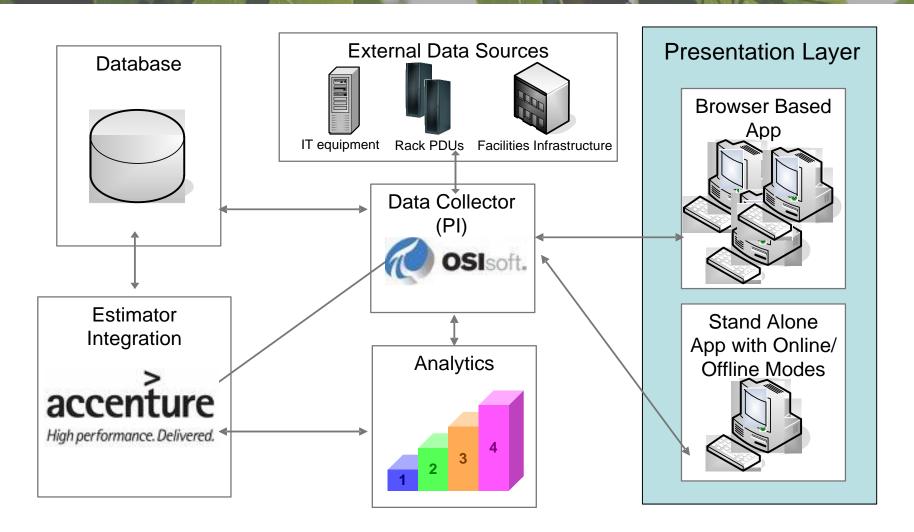
- Utility rebates
- Carbon credits
- Smart Grid or Demand Response initiatives
- Impact from economic stimulus bill
  - Annual OpEx cost per 1,000 servers could be as much as \$800,000 to \$1.6 million<sup>1</sup>

<sup>1</sup>Predictions are that a carbon tax equivalent to \$200 to \$400 per ton will be required to force rapid and fundamental changes in US energy consumption behavior. The annual OpEx cost per 1,000 servers could be significantly higher than \$200,000 (i.e., as much as \$800,000 to \$1.6 million). – Uptime Institute

## Our Joint Solution: Accenture and OSIsoft

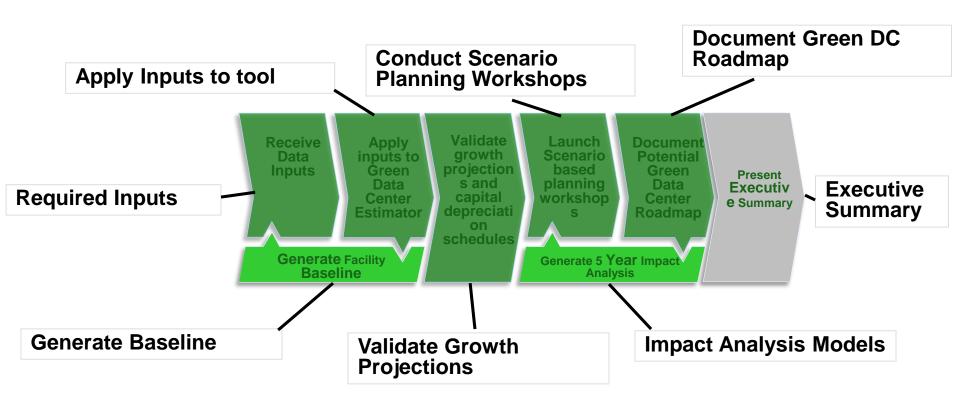


## **High Level Technology Components**



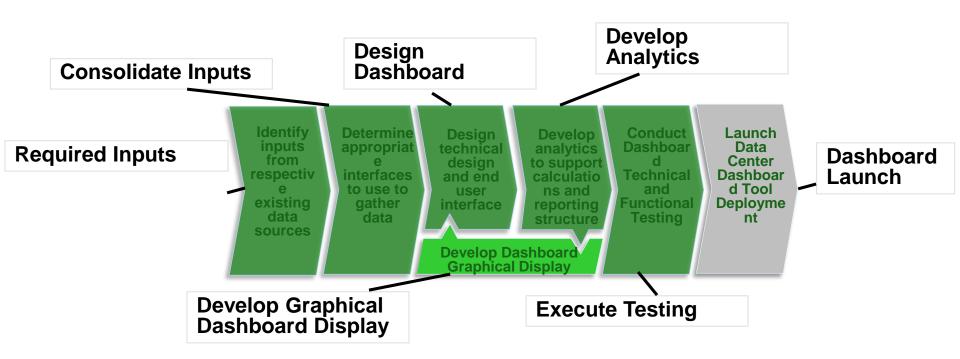
### Methodology - Data Center Estimator

A structured process will be deployed to support the delivery of the Green Data Center Estimator.



### Methodology - Data Center Dashboard

A structured process will be deployed to support the delivery of the Data Center Dashboard as a real-time monitoring solution.



## Dashboard Pilot Proof of Concept: Data Center in West Germany

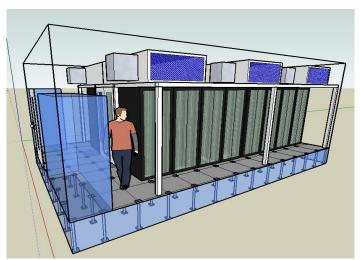
#### **Objectives**

- Cost Takeout
- Increase operational intelligence

#### Landscape

- Accenture owned and operated
- Production
- Current Capacity: 500 kW data center
   150 racks with 500 physical servers
- Modular design: 16 cells with 2 additional network distributor rooms
- IT monitoring at the PDU level
- Power and cooling data by M-bus system
   Siemens Desigo Insight for BMS data





### Dashboard Pilot – Pain points

#### Pain points

#### Lack of transparency

No correlation between the power data being collected and the Building Management System data

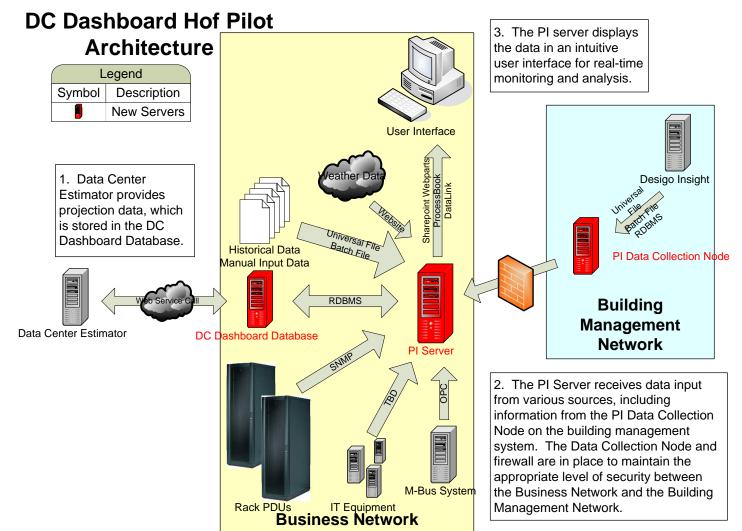
#### No centralized view

Neither system provides a real-time view into the power data but provides historical reports only

#### No support for operational efficiency

Need tool-support to analyze and trend the data being collected to guide future green/data center efficiency initiatives

## Dashboard Pilot - Proposed Solution



## Business Case Savings opportunity by improving operational efficiency

#### **Incredible Potential Savings**

- IT Opportunities \$\$\$\$
  - Optimize operations
  - Identify opportunity for consolidation
  - Scheduling workloads
- Cooling \$\$\$
  - Optimize airflow
  - Identify thresholds and set-points
  - Raise temperature
- Power Delivery \$
  - Optimize configuration
- Other \$\$
  - Evaluate Demand Response Programs
  - Required for Utility Rebates

Based on the results the Accenture-authored Forecast real results of 11 green computing initiatives covered by 17 case studies



www.accenture.com/datacenterreport



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Tasks

Team Discussion

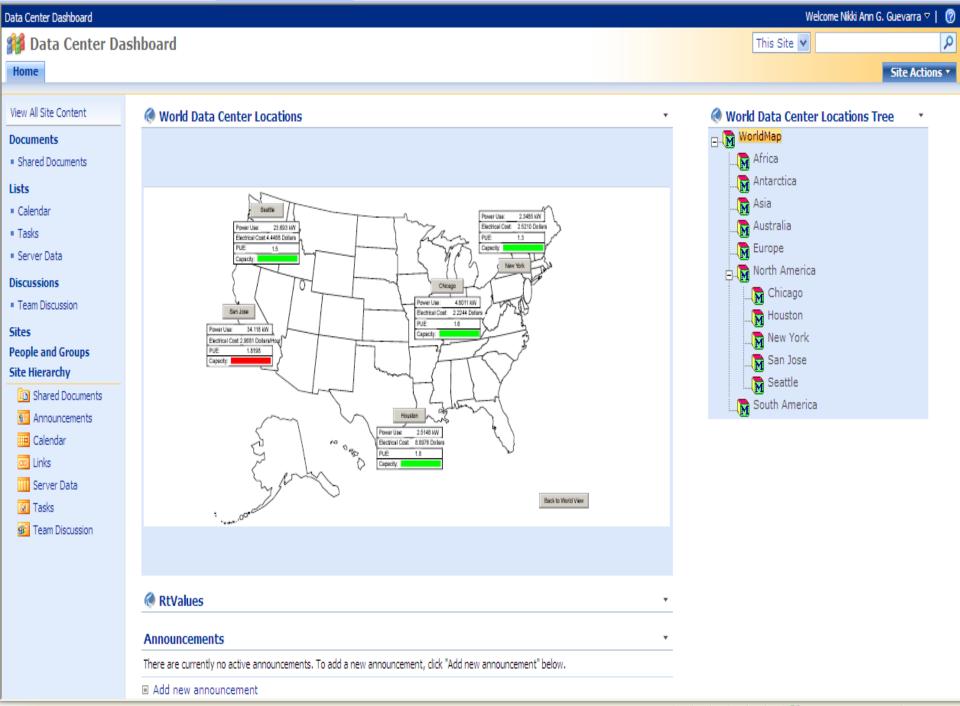


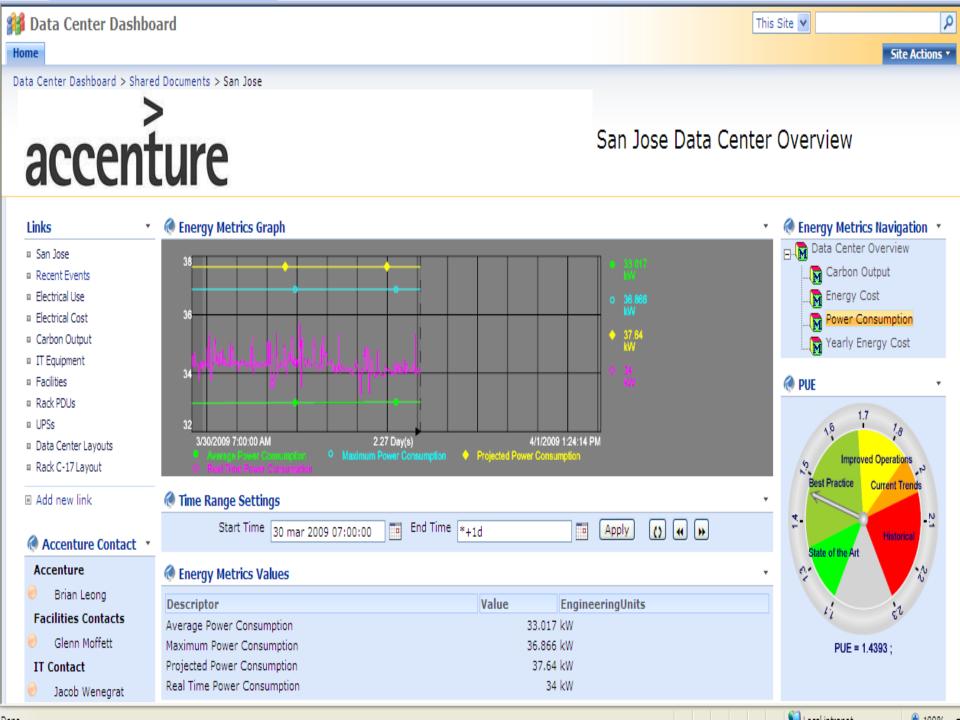
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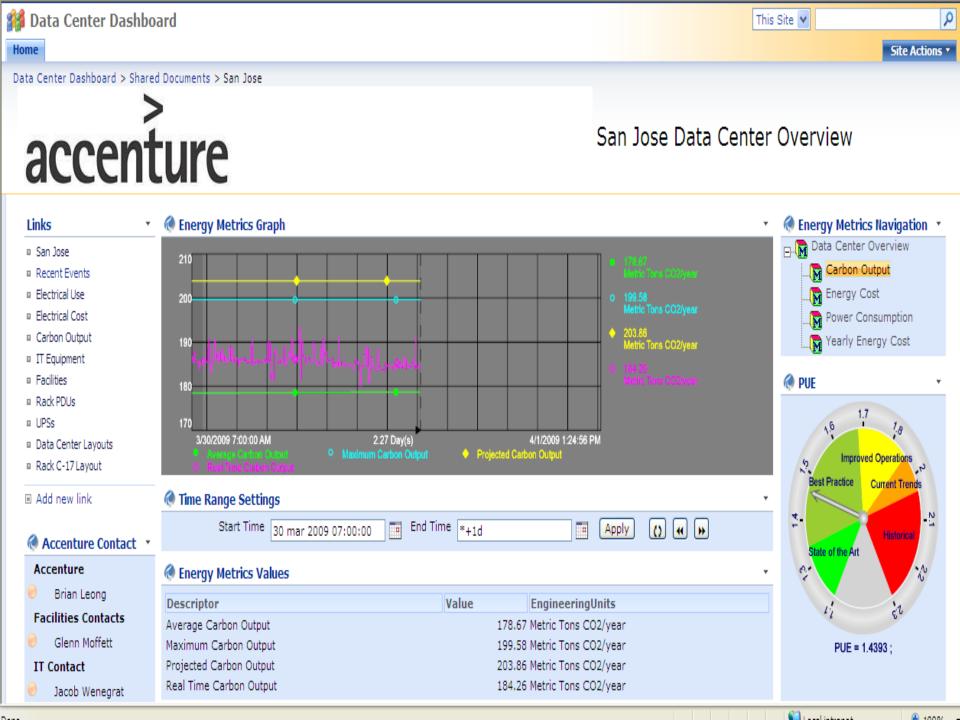
Announcements

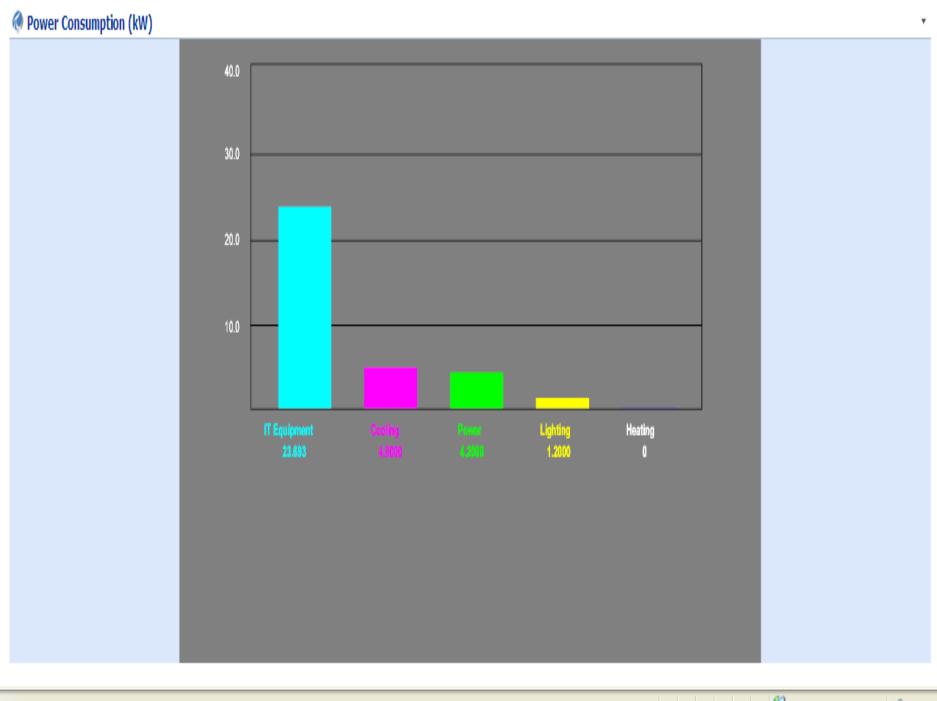
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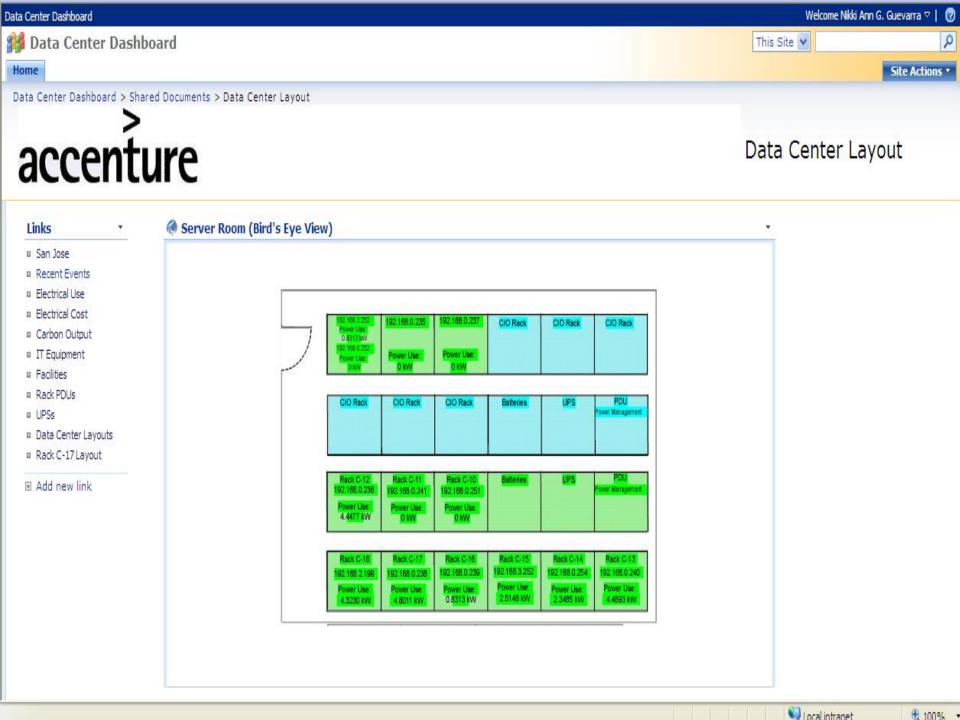
■ Add new announcement



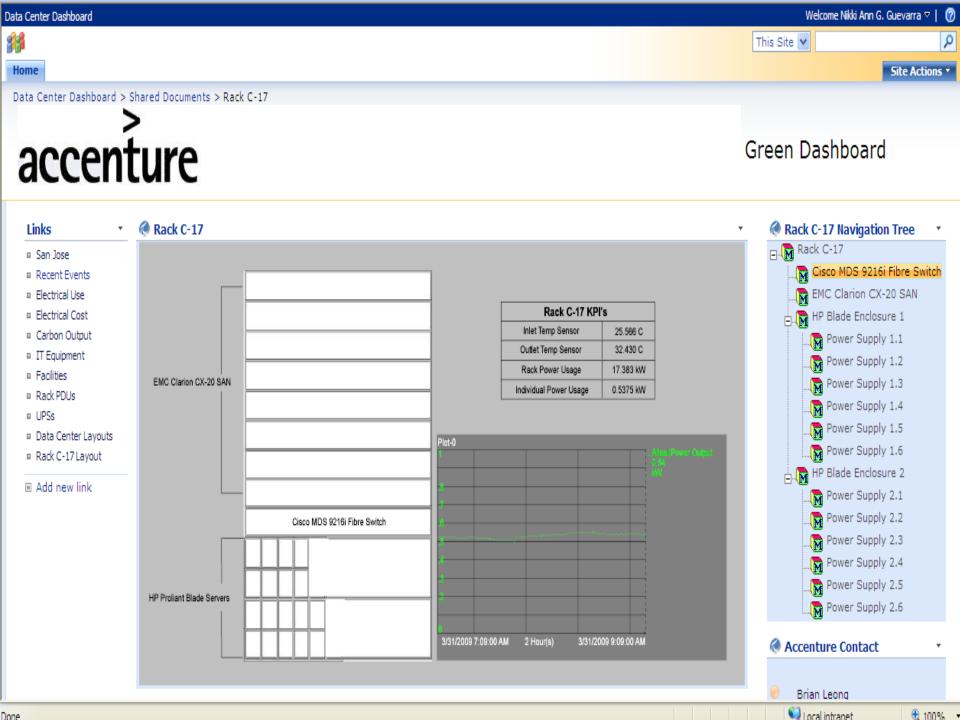


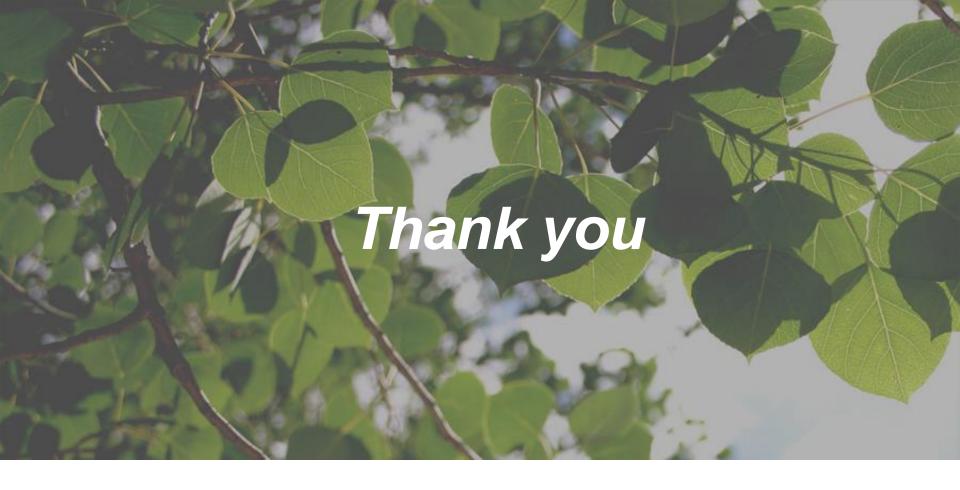






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