

Managing Today's Data Center

Avoiding the Impending Crisis

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INTEROP[®]
MAKES YOU
SUCCEED

The Data Center as a Strategic Component of the Enterprise

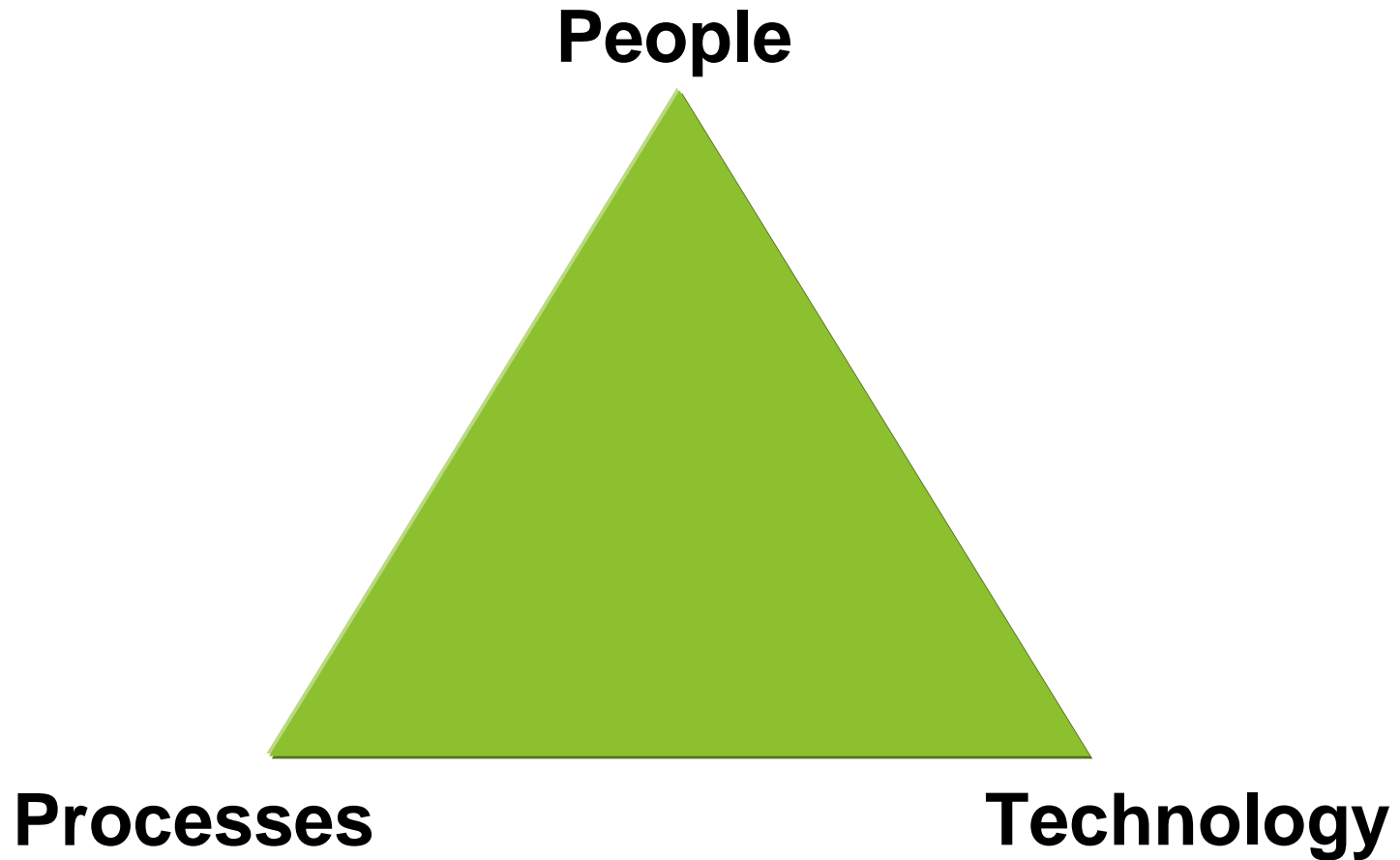
- Pressures for Higher Availability
 - Shrinking Maintenance Windows
- Compliance
 - Sarbanes-Oxley, OCC, HIPPA
- Increasing Complexity
 - New Technologies (Blades)
 - Rates of Change
- Process Methodologies
 - IT Service Management (ITIL)
 - Operational Efficiency
- Organizational Issues
 - IT and Facilities

The Impending Crisis

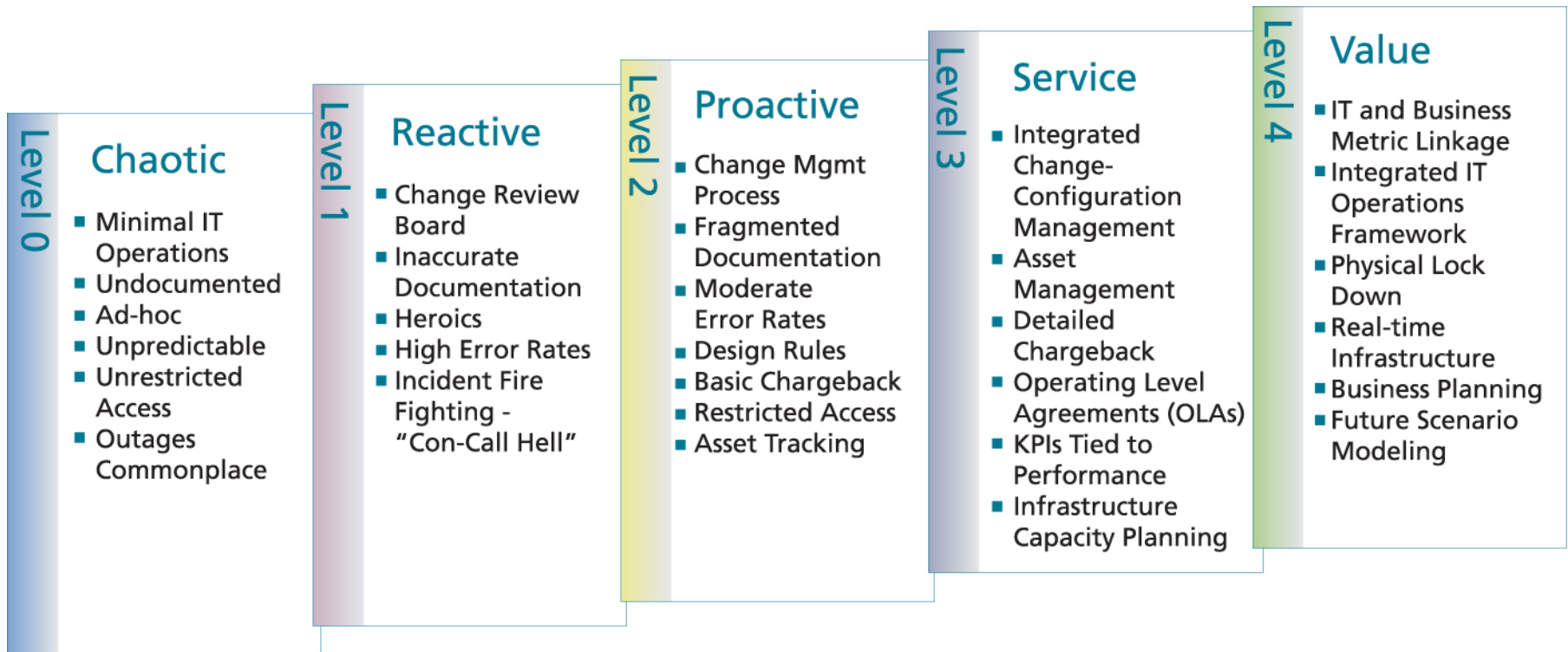
Organizations Cannot Meet Future Demands Without Changing the Way They Run Their Data Centers

Over the next five years power failures and limits on power availability will halt data center operations at more than 90% of all companies – AFCOM/Data Center Institute

The Management Triad



Process: Data Center Infrastructure Maturity



Technology: Data Center Tier Classification

	Tier I	Tier II	Tier III	Tier IV
Building Type	Tenant	Tenant	Stand-alone	Stand-alone
Staffing	None	1 Shift	1 + Shifts	“24 by Forever”
Useable for Critical Load	100% N	100% N	90% N	90% N
Initial Gross Watts per Square Foot (W/ft²) (typical)	20-30	40-50	40-60	50-80
Ultimate Gross W/ft² (typical)	20-30	40-50	100-150 ^{1,2,3}	150+ ^{1,2}
Uninterruptible Cooling	None	None	Maybe	Yes
Support Space to Raised-Floor Ratio	20%	30%	80-90% ²	100+%
Raised-Floor Height (typical)	12”	18”	30-36” ²	30-36” ²
Floor Loading lbs/ft² (typical)	85	100	150	150
Utility Voltage (typical)	208, 480	208, 480	12-15 kV ²	12-15 kV ²
Single Points-of Failure	Many + human error	Many + human error	Some + human error	None + human error
Annual Site-Caused IT Downtime (actuals)	28.8 hours	22.0 hours	1.6 hours	0.4 hours
Site Availability	99.671%	99.749%	99.982%	99.995%
Months to Implement	3	3-6	15-20	15-20
Year First Deployed	1965	1970	1985	1995
Construction Cost (± 30%)^{1,2,3}				
Raised Floor	\$220/ft ²	\$220/ft ²	\$220/ft ²	\$220/ft ²
Useable UPS Output	\$10,000/kW	\$11,000/kW	\$20,000/kW	\$22,000/kW

¹ 100 W/ft² maximum for air-cooling over large areas, water or alternate cooling methods greater than 100 W/ft² (added cost excluded).

² Greater W/ft² densities require greater support space (100% at 100 W/ft² and up to 2 or more times at greater densities), higher raised floor, and, if required over large areas, medium voltage service entrance.

³ Excludes land; architectural, engineering, and commissioning fees; permits and other fees; interest; and abnormal civil costs. These can be several million dollars. Assumes minimum of 15,000 ft² of raised floor, architecturally plain, one-story building, with power backbone sized to achieve ultimate capacity with installation of additional components or systems. Make adjustments for NYC, Chicago, and other high cost areas.

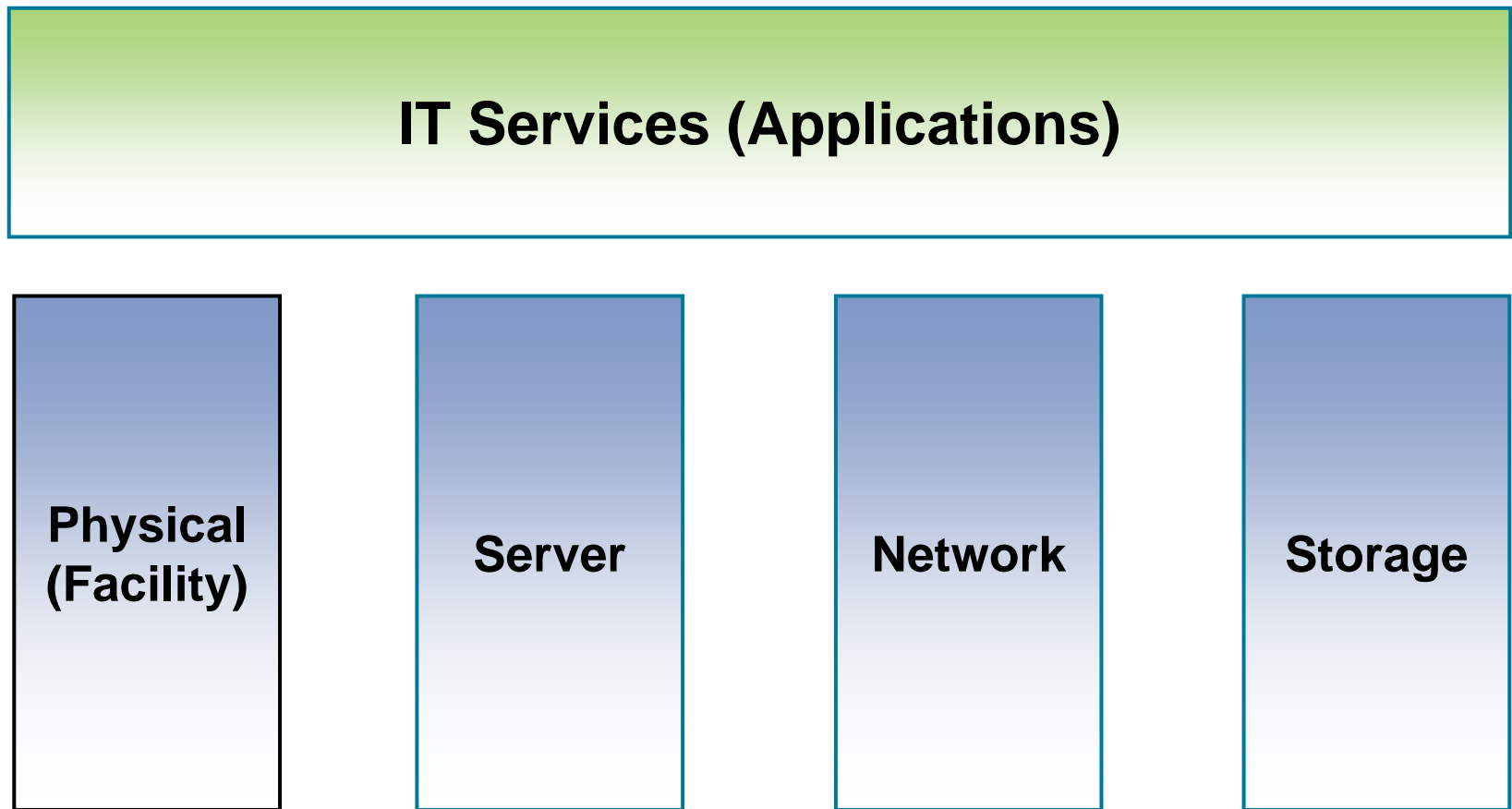
Addressing the Human Equation

- Approximately 25-75% of Disruptions
- Two Basic Ways for an Action to go Wrong
 - Plan is adequate, but subsequent action does not go as intended
 - Action proceeds according to plan, but the plan is inadequate
- Basic Management Issue
 - Address by Instituting Processes
 - Use Management Systems to Provide Structure and Information

Data Center Physical Infrastructure

- Why is Physical Infrastructure So Important
 - Foundation for Logical Management
 - Layer 0
 - Interdependencies between Space, Power, Cooling
 - New, High Density Servers (Blades)
 - Virtualization Will Not Incorporate Physical

IT Infrastructure: The “Silo View”



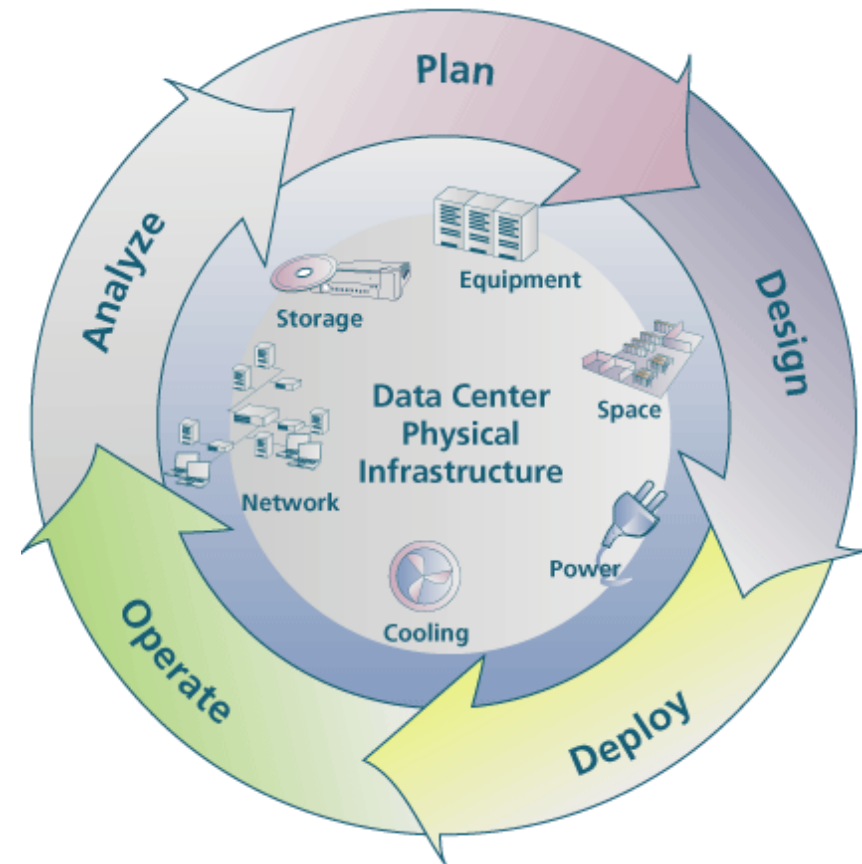
Company Mission

Aperture's mission is to change the way companies run their data centers



Aperture VISTA

Aperture VISTA is an *enterprise software solution* which *reduces operational risk* and *improves efficiency* through the *visual* management of the data center.



Aperture VISTA for Physical Infrastructure Management

The screenshot displays the Aperture VISTA web interface in a Microsoft Internet Explorer browser window. The interface is divided into several sections:

- Installation Information:** Includes fields for Proposed Installation Date, Urgent Request (Yes/No), Power Provisioning (Yes/No), Network Provisioning (Yes/No), and Storage Provisioning (Yes/No).
- Preferred Location:** Includes fields for Building (NYC), Floor (02), and View (NYC CR200.DC). Buttons for "Select Data Center" and "Show Data Center Drawing" are present.
- Project Information:** Includes fields for Project Name, Cost Center, Cost Center Manager, and Project Comments.
- Supporting Documentation:** Includes an "Upload a file" section and an "Attached files" section showing a file named "Diagram.ppt" uploaded on 1/20/2006 at 1:05:25 PM.
- Devices:** A table listing device details:

Manufacturer	Model	Device Type	Platform	OS Level	Machine Category	Machine Type	System Name	Space Assignment
DELL	POWEREDGE 6400	SERVER	Wintel	XP	Development	Database Server	Sys1	

Total Devices: 1

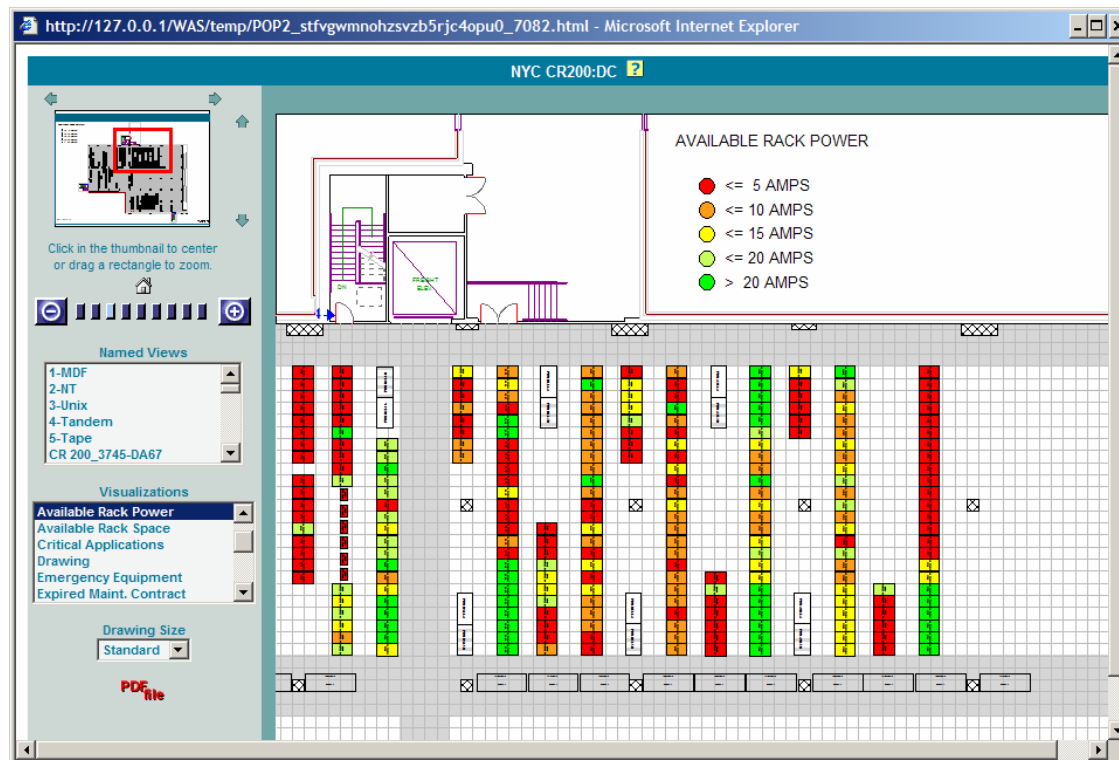
- Subforms:** A table listing subform details:

Type	Changed	Status	Routed To	Tracking #
Space	1/20/2006 1:06:17 PM	new		060120130513
Network	1/20/2006 1:06:17 PM	new		0601201305131
Power	1/20/2006 1:06:17 PM	new		0601201305132
Storage	1/20/2006 1:06:17 PM	new		060120130514

- Diagram:** A detailed server rack diagram titled "NYC CR200:Row :BO79 F". The diagram shows a row of server racks labeled BO79.F, with individual rack labels BO85.BO85, BO84.BO84, BO83.BO83, BO82.BO82, BO81.BO81, and BO80.BO80. Each rack contains multiple server units with various components and connections visible.

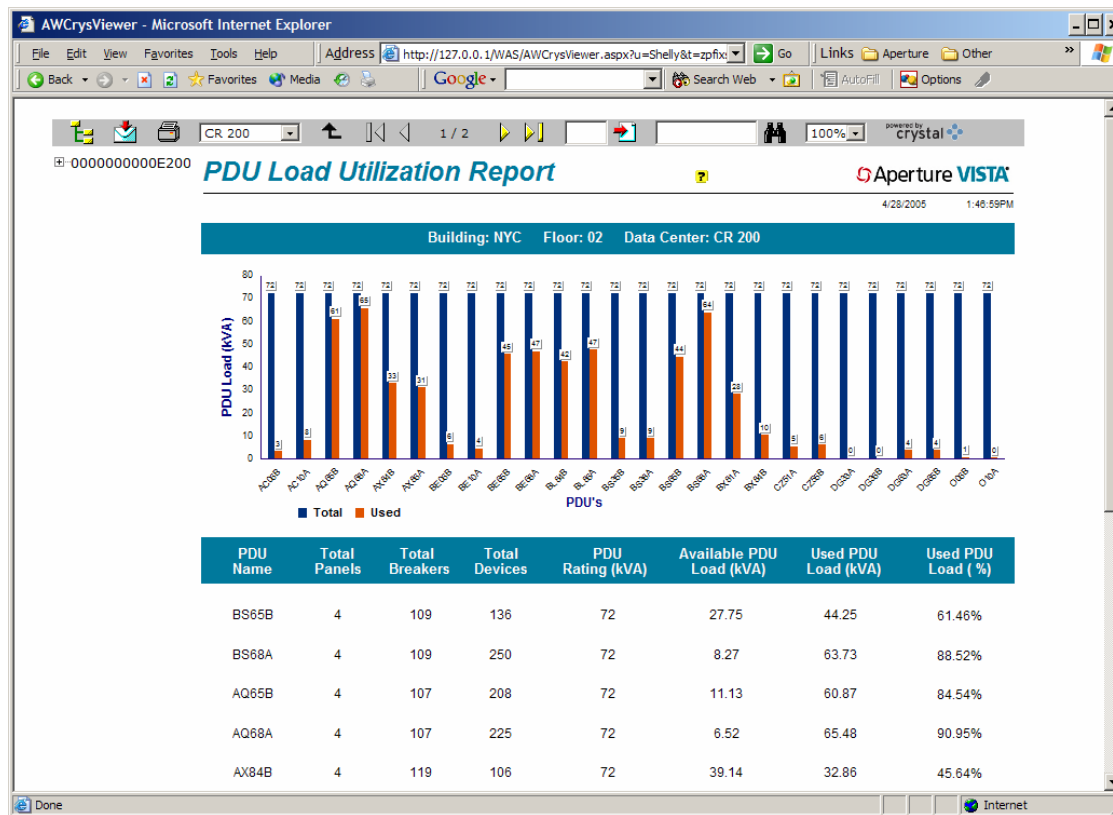
Integrated Change and Configuration

Aperture VISTA for Physical Infrastructure Management



Rack Level Capacity Analysis

Aperture VISTA for Physical Infrastructure Management



Reporting and Analysis

Mature Physical Infrastructure Process and Tools

- ***Enable You to Manage Your Data Centers with Confidence...***
 - Achieve Higher Levels of Availability
 - Leverage Investment in Site Infrastructure
 - Gain Control of Complex Data Center Environments
 - Achieve Standardization Across Multiple Data Centers
 - Support High-Density Servers (Blades)
 - Better Manage Data Center Capacities

Deliver Competitive Advantage to Your Organizations

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