Remote Management of Data Center White Space: What to Manage and How?

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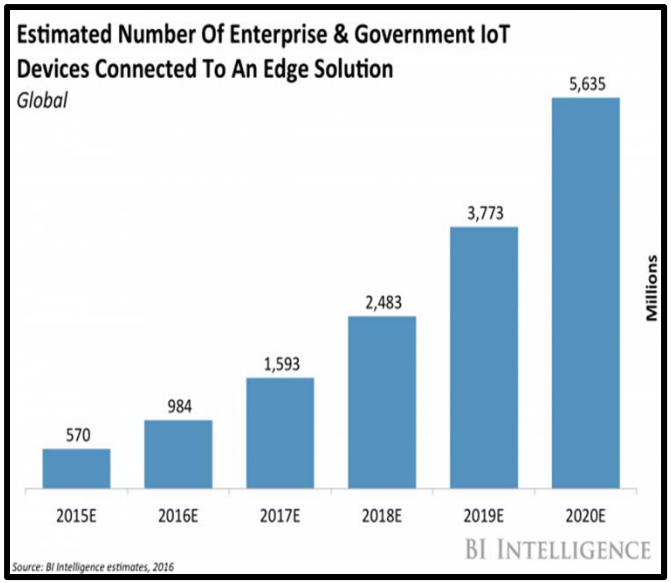
Learning Outcomes

- Need for Remote Management of Whitespace
- Understand Elements of Whitespace Management
- Solutions to Minimize Management Challenges

Data Center Trends

Need for Remote Management

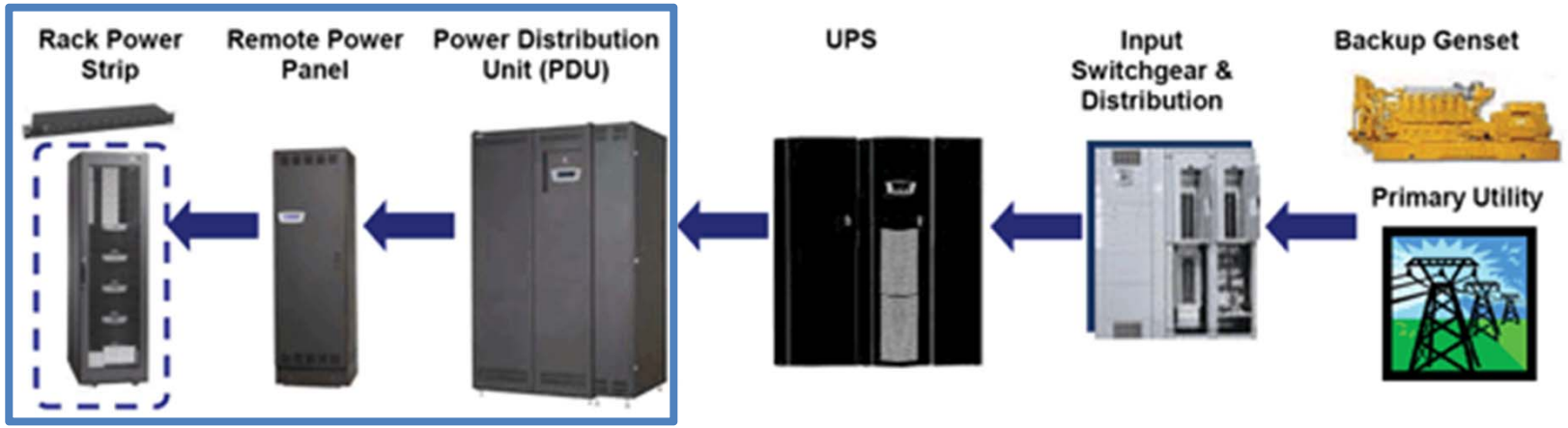
- Edge Computing and IoT
- Colocation and Managed Data Centers
- Lights-Out Data Centers



White Space Initiatives and Solutions

Initiatives	Solutions
• High Availability • Capacity Optimization • Low Operating Costs • Efficiency • Manageability • Security and Regulatory Compliance	• High Density Solutions • Power Management • Environmental Monitoring • Access Control • Datacenter Infrastructure Management (DCIM)

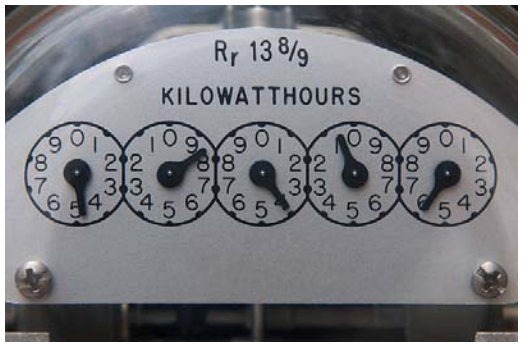
Power Management



Last Leg of the Power Chain Resides Within White Space

Power Management: What?

- Consumption vs capacity
- Branch circuit metering
- Redundancy monitoring
- Chargeback reports
- Equipment level consumption



Power Management: How?

- Invest in remotely manageable intelligent hardware—Rack Power Distribution Units (PDUs) and Remote Power Panels (RPPs)
- Choose rack PDUs with high temp ratings
- Deploy DCIM to provide snapshot health information as well as trend reports

Power Management: RPP / Floor PDU

METERING PARAMETER	ADVANTAGES
Input and Output Voltage	• Monitor power quality
Input and Output Current and Power	• Monitor overall power capacity • Balance loads across phases
Remote Metering – Outlet Level	• Monitor current draw against breaker capacity

Power Management: Rack PDU

CAPABILITIES	ADVANTAGES
Remote Metering - Input	• Cabinet power loading • Load balancing
Remote Metering – Branch Circuit	• Proactive overload notification • Optimize capacity usage
Remote Metering – Outlet Level	• Chargebacks • Equipment power consumption visibility • Ghost servers
Remote Power Control – Outlet Level	• Reboot hung up equipment • Scheduled start up and shutdown • Outlet provisioning

Power Management: Rack PDU or RPP?

- Ideally at both levels
- Limited budget – choose rack PDU level
  - 1:1 association - Rack PDU and RPP breakers
  - Rack PDUs have branch circuit breakers too
  - More granular complete visibility = concrete steps to reduce power consumption

Environmental Management: Why?

- Minimize hardware failures
- Reduce cooling and (hence) operational costs
- Safety

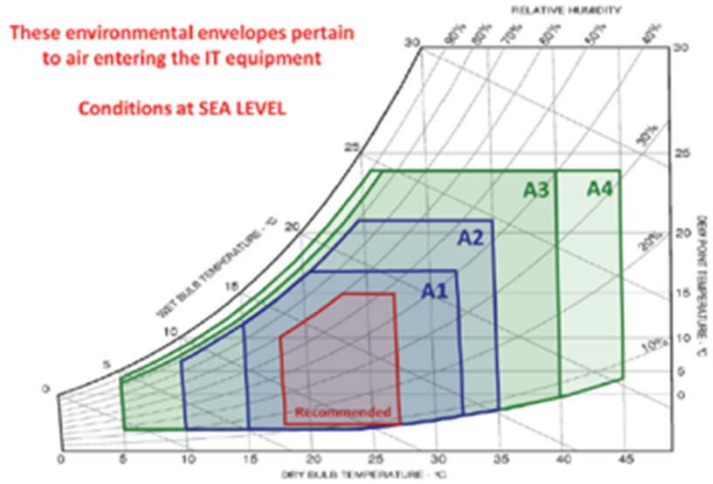


Figure 2.3 2015 recommended and allowable envelopes for ASHRAE Classes A1, A2, A3, and A4.

Environmental Management: What?

PARAMETER	RECOMMENDED RANGE
Air Intake Temperature – Top and Bottom Front of Cabinet	• 18 – 25°C / 64° - 80°F
Air Exhaust Temperature – Top Back	• Intake temp + 20°C / 35°F
Relative Humidity	• 40% - 60%
Leak Detection	• Under raised floor

Electronic Access Control – Why?

- *"58% of attacks within financial services industry and 71% within healthcare are carried out by insiders"*
  - IBM X-Force Threat Intelligence Index
- Regulatory Compliance
  - HIPAA, PCI-DSS, FEMSI

Access Control - Considerations

- Cabinet Level
- Logging of all access attempts – user name, time stamp and how?
- Alerts for unlocked cabinets and open doors
- Biometric cards for multi factor authentication
- Separate system for datacenter access
  - Provides full control to datacenter personnel
  - Lower cost of deployment

White Space Management: Challenges

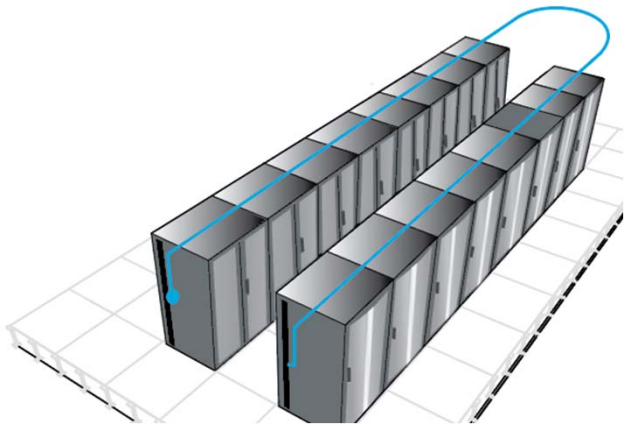
- High cost of networking all remotely managed equipment
- Lack of cohesive integration
- Multiple management platforms

Solutions – IP Consolidation Technologies

Reduce Network Costs | Reduce Number of IP Addresses

90%!

- IP addresses can cost as high as $500/port
- IP consolidation technologies help significantly reduce networking costs and complexity
- Consider failover capability with IP consolidation



Solutions – Integrated Hardware

Local Power Monitoring

EAC Front

Environmental Monitoring

EAC Rear

Network Management

Solutions – Preconfigured Cabinet

- Saves deployment time and costs
- Seamlessly integrated
- Tested as a complete system
- Saves packaging

Solutions - DCIM

- Integrated software - power management, environmental monitoring and access control
- 24/7 data center health monitoring
- Historical trend reports
- Data and event logging

DCIM - Considerations

- Scalability
- Vendor agnostic
- Exportable database
- Integration capabilities

Summary

- Remote management of white space will become more critical
- Elements to be managed include – power, environmental and access control
- Integrated hardware and software solutions minimize management challenges