

# 7<sup>th</sup> ANNUAL SURVEY RESULTS

**Ali Moinuddin**

Managing Director, Uptime Institute EMEA

# Proven and Adopted



Certified Resilience



Operational Excellence



More than 1,200 Certifications in over 87 Countries



IT Efficiency



Accredited Training

# What We Do

Uptime Institute simplifies the process of planning, designing, building and operating a data center.

**WE DELIVER BUSINESS VALUE BY REDUCING THE RISK OF  
INFRASTRUCTURE OUTAGES**

# 7<sup>th</sup> Annual Uptime Institute Survey

- Insights from over 1,000 data center executives and end users from around the globe.
  - › How are companies adjusting to shifting budgets and deployment models?
  - › What impact is cloud computing having on capacity planning?
  - › What are the adoption rates for new technologies?
  - › What are the biggest challenges facing IT Infrastructure organizations in the coming year?

# Demographics: Over 1,000 Respondents





# Survey Responses From End-users Only

## Job roles

Senior Executives



IT Managers



Facility Managers



# Vertical Industries Represented



# Uptime Institute Client Participation in Survey

**29% of respondents operate an Uptime Institute Tier-Certified data center**

**29%**

**18% of respondents are Uptime Institute Network members**

**18%**

**10% of respondents operate data center with M&O Stamp of Approval**

**10%**



# 2017 Data Center Industry Survey; Megatrends

**Phil Collerton**

Managing Director, Uptime Institute EMEA

25<sup>th</sup> July 2017


# Industry-wide Consolidation



**60%** of enterprise IT server footprints  
are flat or shrinking

## Why?

Increased performance at the processor level 

Increased adoption of server virtualization 

Rapid Cloud computing adoption 

# Hybrid deployment models hold steady

Please estimate percentages representing where your IT assets are currently deployed:

Enterprise-owned Data Center

65%

Colocation or Multi-tenant Data  
Center Provider

22%

Cloud Computing

13%

# Cloud Siphoning Off Some Workloads

**67% of respondents see workloads that would previously have resided in their own data centers going to the cloud**



**The largest organizations are 10% more likely to deploy to the cloud than the smallest IT groups.**

# Mostly an Executive-level Decision

What percentage of respondents are very involved in the decision-making process regarding deployment in colocation and cloud?



Senior Execs

59%



IT Management

41%



Facilities Management

14%



# Governance, Planning, Processes Need Work

**Over 70% of respondents said that their organization's process for evaluating cloud and colocation providers could use improvement. 15% described it as incoherent.**



# Data Center Capacity Planning Under The Specter of Cloud

- Around half of enterprise facilities teams are updating legacy sites
- Running critical IT out of a well planned datacenter built some time ago is not a bad thing
- If you are making the most of existing assets and upgrading live sites, operations (sequencing, training, maintenance) become even more critical

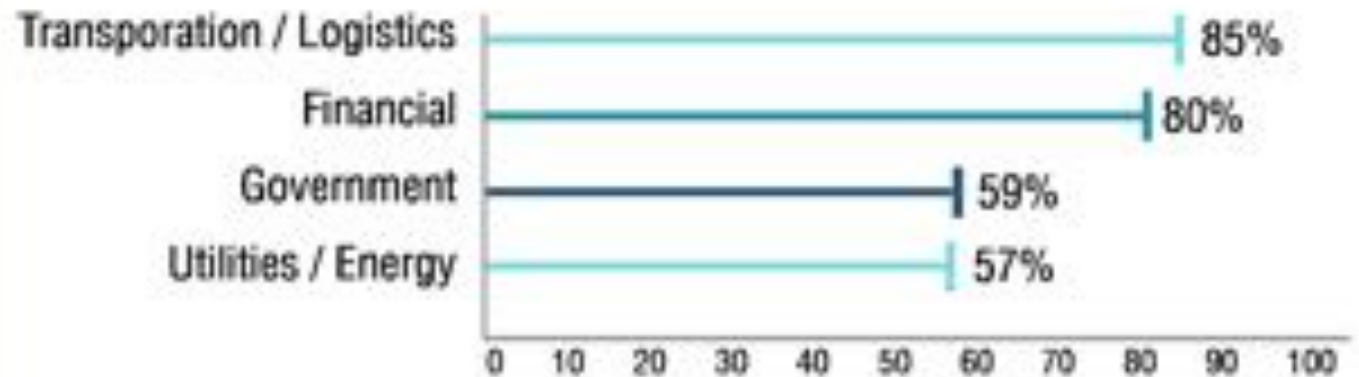
# Application failover: Hype vs Reality

Does your organization employ a multi-site IT resiliency strategy that incorporates multiple data centers and relies on live IT application fail-over?



**Yes 68%**  
**No 22%**  
**Don't know 10%**

**Multi-site IT Resilience by Industry:**



# Not worth the risk?

If you are deploying an IT resilience strategy, is that plan impacting your data center facilities investment?

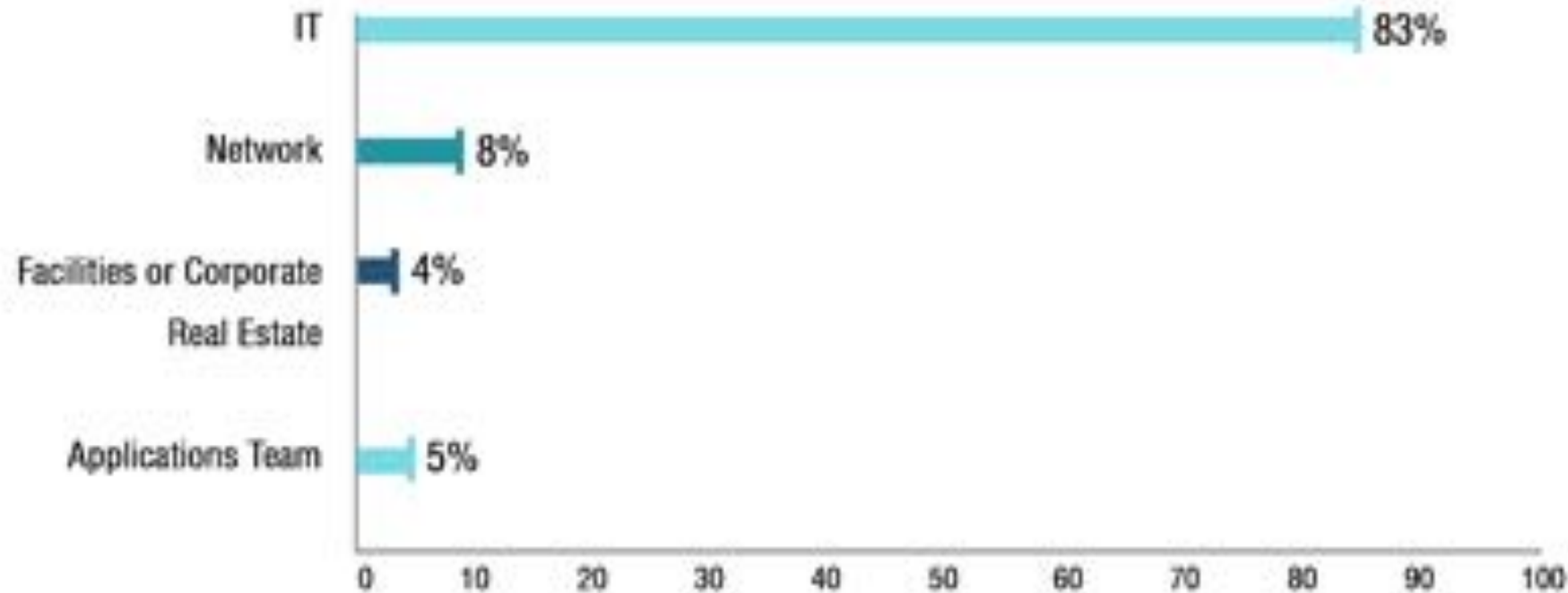
No, data center redundancy and availability is still critical to our organization's IT 73%

Yes, we are investing in lower availability, less redundant data centers 27%



# IT is Calling The Shots

## Which team owns the strategy for IT resiliency decisions?





# Apps Teams Becoming Involved

**Which teams participate in shaping the strategy?**



# Confidence Seems Pretty High...



How confident are you in your organization's multi-site IT resiliency strategy? Will applications, networks, and IT services function as expected in an outage?

Confident 68%

Not entirely confident 31%

No confidence 1%

# Downtime matters



Almost **90%** of organizations conduct root cause analysis of an outage

Over **60%** of organizations say they measure the cost of downtime

Only **8%** of respondents said their management is less concerned about IT outages than they were a year ago

# Hard Work Paying Off For Some!

Overall, around 25% of survey respondents experienced a data center outage in the last twelve months.

Members of the Uptime Institute Network had half as many instances.



# Downtime happens



## Data Centre

### Electrical box fault blamed for GS2 data centre outage

Second outage at huge data centre in three months

20 Sep 2016 at 09:21, Kat Hall



COLOCATION, CONNECTIVITY, DOWNTIME, EQUINIX, LONDON, NETWORKING, PEERING, POWER, TELECITY

## Equinix Data Center Outage in London Blamed on Faulty UPS

BY YEVGENIY SVERDLIK ON JULY 21, 2016

1 COMMENT



269

4



EDITION UK



CIO HARDWARE MICROSOFT STORAGE INNOVATION HARDWARE APPLE MORE NEWS & TOPICS

MUST READ THIS PHISHING SCAM POSES AS A CHARITY EMAIL, DELIVERS RAMNIT BANKING TROJAN MALWARE

## Circuit breaker failure was initial cause of Salesforce service outage

Cloud company shares details of investigation into outage



By Danny Palmer | May 18, 2016 -- 14:09 GMT (13:09 BST) | Topic: Servers

## DOWNTIME, ENTERPRISE

## Delta: Data Center Outage Cost Us \$150M

BY YEVGENIY SVERDLIK ON SEPTEMBER 8, 2016

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Financial Conduct Authority UK + Add to myFT

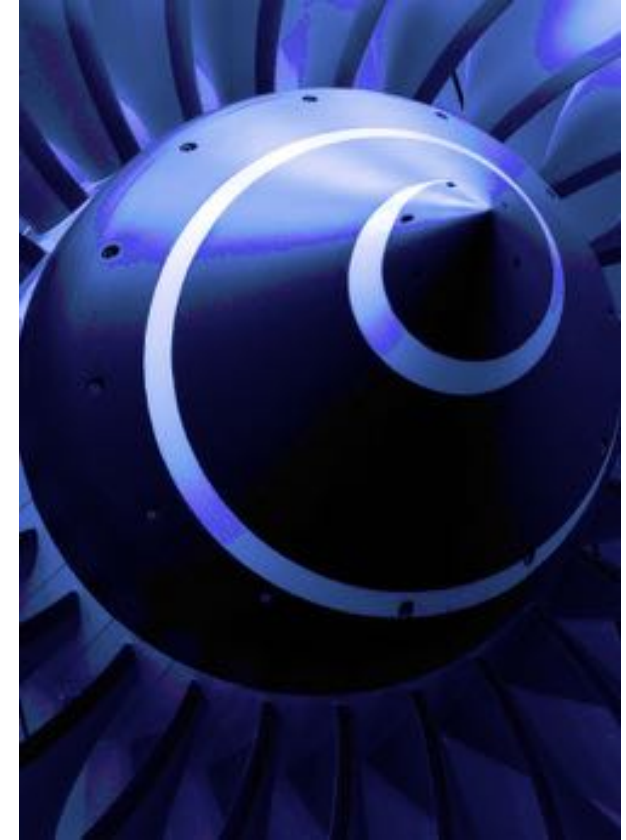
### IT outage hits Financial Conduct Authority

Eyebrows raised after system goes down at regulator that takes a tough stance on IT failures



# “IT resiliency” cost Southwest Airlines tens of millions of dollars

- A poorly understood single router error set off cascading systemic failures in 2016.
- Media calling for CEO’s resignation
- Millions in lost earnings and stock price devaluation
- Thousands of customers inconvenienced and angered



# Uptime Institute Prediction...



The screenshot shows the Uptime Institute website. The header includes the logo and navigation links: Welcome, Journal, Meet the Team, Contact, and a search icon. Social media icons for Facebook, Twitter, LinkedIn, and YouTube are also present. Below the header is a large yellow banner with a black lightning bolt on the left, a black airplane silhouette in the center, and another black lightning bolt on the right. Below the banner is the article title "Airline Outages FAQ: How to Keep Your Company Out of the Headlines" with a sub-headline "in Executive Operations". The article text discusses a power control module failure at a Delta Airlines data center on Monday, August 6, 2016, which caused hundreds of flight cancellations and cost the airline millions of dollars. It mentions that while equipment failure is the proximate cause, Uptime Institute's long experience evaluating the design, construction, and operations of facilities suggest that many enterprise data centers are similarly vulnerable because of construction and design flaws or poor operations practices. A section titled "What happened to Delta Airlines?" follows, stating that while software is blamed for many well-publicized IT problems, Delta Airline is blaming a piece of infrastructure hardware. According to the airline, "...a critical power control module at our Technology Command Center malfunctioned, causing a surge to the transformer and a loss of power. The universal power was stabilized and power was restored quickly. But when this happened, critical systems and network equipment didn't switch over to backups. Other systems did. And now we're seeing instability in those systems." It also mentions that Delta is at its word. Another paragraph states that some of the first reports blamed switchgear failure or a generator fire for the outage, but later reports suggested that critical services were housed on single-corded servers or that both cords of dual-corded servers were plugged into the same feed, which would explain why backup power failed to keep some critical services on line. The final paragraph points out that pointing to the failure of a single piece of equipment can be very misleading, as Delta's facility was designed to have redundant systems, so the facility should have remained operational had the facility performed as designed. In short, a design flaw, construction error or change, or poor operations procedures set the stage for the catastrophic failure.

Uptime Institute has prepared this brief airline outages FAQ to help the industry, media, and general public understand the reasons that data centers fail.

The failure of a power control module on Monday, August 6, 2016, at a Delta Airlines data center caused hundreds of flight cancellations, inconvenienced thousands of customers, and cost the airline millions of dollars. And while equipment failure is the proximate cause of the data center failure, Uptime Institute's long experience evaluating the design, construction, and operations of facilities suggest that many enterprise data centers are similarly vulnerable because of construction and design flaws or poor operations practices.

**What happened to Delta Airlines?**

While software is blamed for many well-publicized IT problems, Delta Airline is blaming a piece of infrastructure hardware. According to the airline, "...a critical power control module at our Technology Command Center malfunctioned, causing a surge to the transformer and a loss of power. The universal power was stabilized and power was restored quickly. But when this happened, critical systems and network equipment didn't switch over to backups. Other systems did. And now we're seeing instability in those systems." We take Delta at its word.

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Uptime Institute

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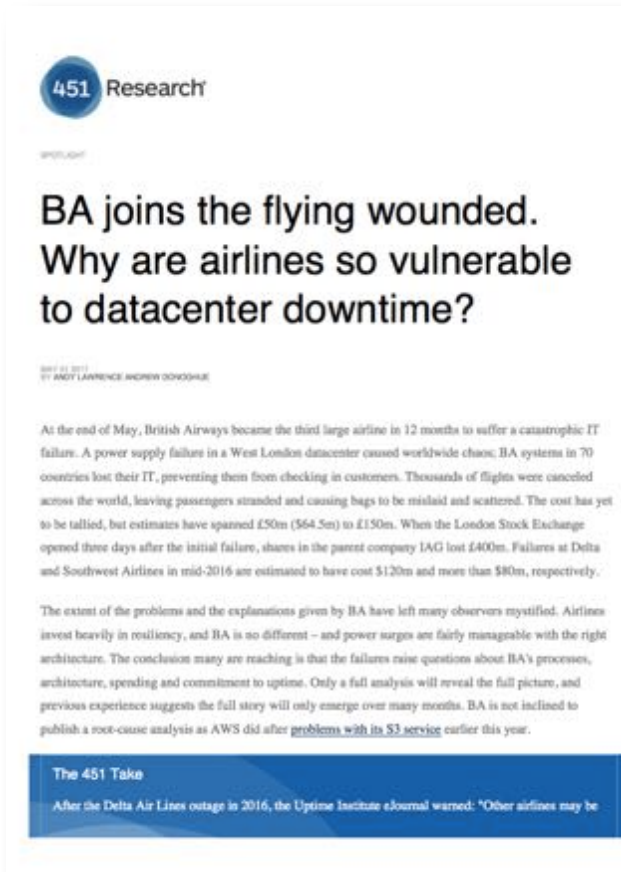
“Airlines may be similarly vulnerable because of skimpy IT budgets, poor prioritization, and bad processes and procedures.”

# Delta Airlines Outage



- August 2016, computer outage prompted the airline to cancel roughly 2,300 flights impacting hundreds of thousands of passengers and prompting three days of chaos.
- A malfunction in an ageing piece of equipment at its data centre had caused a fire which knocked out its primary and back-up systems.
- This system failure knocked \$100m off revenues in August. In January 2017, a smaller outage resulted in hundreds of flights being cancelled.

# Global Outages Continue to Happen...



£360M > reduction in market valuation

Call for CEO to resign

Brand severely impacted

# The Global Data Centre Authority



- 1200+ Certifications in 88+ Countries
- 120+ M&O awarded
- 2100+ ATD/ATS/AOS awarded



# Other outages...



“Systems failure”  
impacted 600K  
customers.  
Company fined  
£56M



“systems failure”  
impacting  
customers



a “technical  
configuration”  
froze the market”  
\$10M accrual set  
aside



“upgrade of its  
computer  
systems locked  
customers out of  
accounts”

# Uptime Institute AIRs

**UptimeInstitute®**  
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**Add a New AIR**

[Batch Entry](#) [AIRs Batch Entry Template](#)

**Member Info. & Basic Incident Details**

\* Your Name

(\*)

\* Your Email

(\*)

\* Site Code

000

(\*)

Your Incident No.(If any)

(\*)

\* Incident Date

(\*)

\* Incident Time

(\*)

Flash Distribution

☐ Yes ☒ No

(\*)

\* Source of 1st Indication

Choose

(\*)

\* Root Cause Category

Choose

(\*)

\* Root Cause Type

(\*)

# Match Outage Root Cause - Globally

## AIRs Matching Your Search Criteria [Modify Search](#) [New Search](#)

By default, search results are sorted chronologically by *Incident Date*. To reverse the sort order, double-click the *Incident Date* column heading. Results may also be sorted by *Incident #*, *Entry Date*, *Manufacturer* and *Model/Capacity* by double-clicking the appropriate column heading.

### Search Results

Incident #	Entry Date	Incident Date	Manufacturer	Model/Capacity	Infrastructure System Affected	Infrastructure System Type	view
2013-210	2013-05-08	2013-04-07	MGE	EP50000/600KVA 72-130100-44	Electrical	UPS System	
2010-274	2010-04-30	2009-12-30	MGE	EPS 6000	Electrical	UPS System	
2010-128	2009-10-12	2009-09-03	MGE	EPS 6000/ 750KVA	Electrical	UPS System	
2009-419	2009-05-18	2009-01-26	MGE	EP50000/400KW	Electrical	UPS System	
2010-151	2009-10-20	2009-01-26	MGE	MGE EPS60000/400kw	Electrical	UPS System	
2009-390	2009-04-09	2008-11-14	MGE	EPE-6000 750 kVA	Electrical	UPS System	
2007-372	2007-06-27	2007-06-26	MGE	EPS 6000	Electrical	UPS System	

# **Data Center Industry Survey; Adoption Trends**

**Phil Collerton**

Ali Moinuddin, Uptime Institute Europe

# The tradeoffs with fire suppression

Have you ever experienced a data center fire?

Yes 11%

No 89%



Accidental discharges of fire suppression happen three times as often as data center fires.



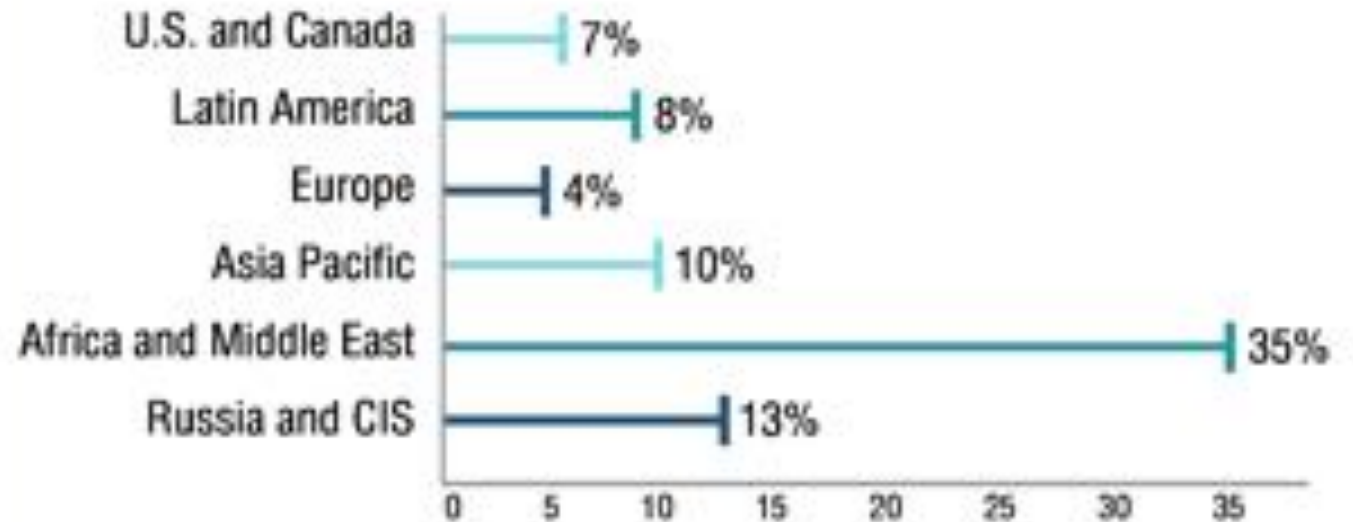
# Lithium Ion in the Data Center

Has your organization considered or implemented lithium ion batteries in the data center?



**Installed 10%**  
**Considering 26%**  
**No 64%**

**Lithium Ion Adoption by Region**



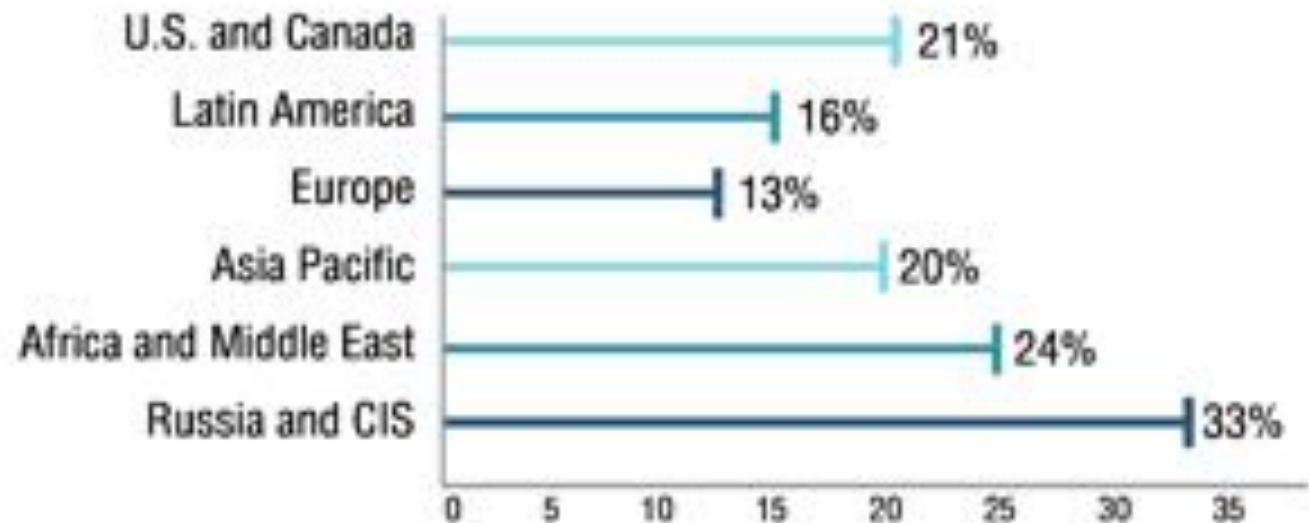
# On-site Power Gen Varies by Region

Has your organization considered or installed on-site primary power generation (renewable energy or natural gas)?



**Installed 21%**  
**Considering 22%**  
**No 57%**

**Installed on-site power generation by geography**



# Advanced cooling on the rise?



## Cooling Technology Adoption

Liquid cooling at the rack or server level 19%

In-rack or In-row cooling 41%

Direct air economization 31%

Indirect economization 29%

Hot or Cold-aisle containment 78%

Variable Frequency Drives 57%

# Server density still fairly low



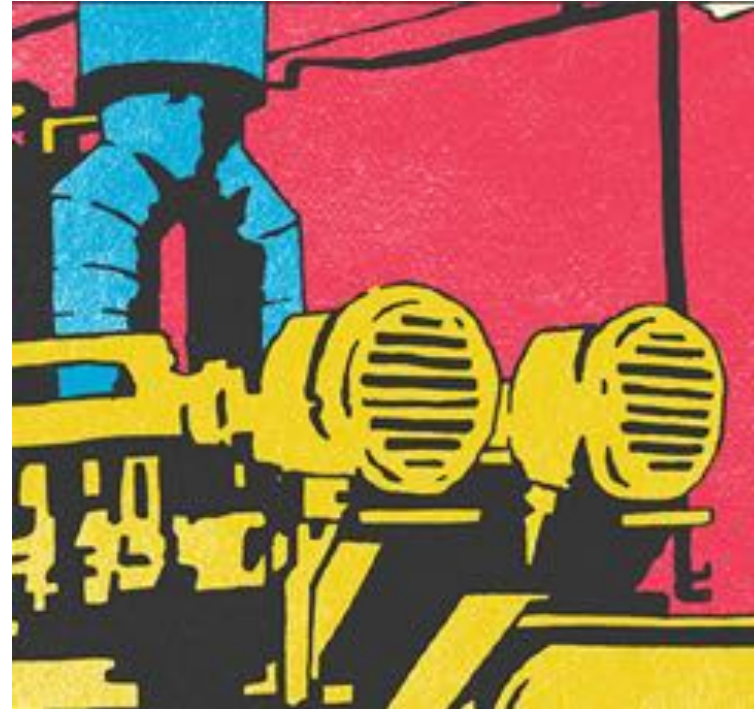
## Average Power Density

<4kW per rack 34%  
4–5.99kW per rack 33%  
6–7.99kW per rack 16%  
8–9.99kW per rack 8%  
10–12kW per rack 5%  
>12kW per rack 4%



# Capital project in North America, 2016

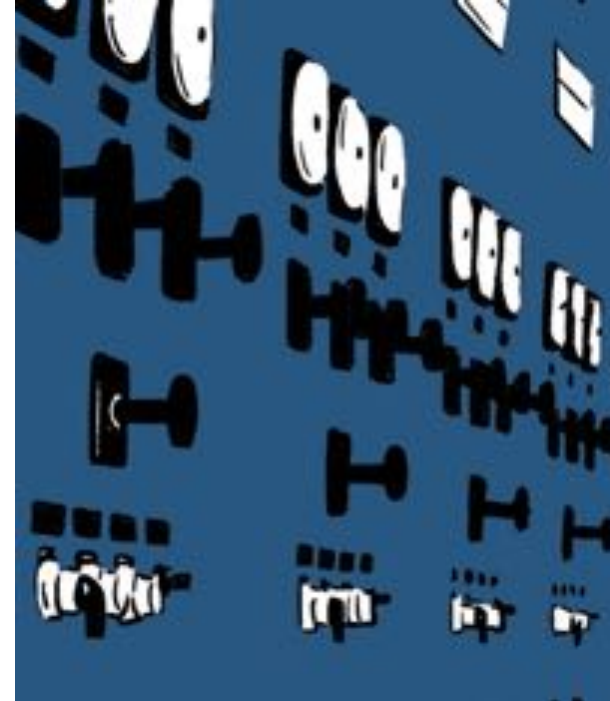
- Backup power systems failed during a simulated electrical utility outage.
- The underlying reason for the failure was a “feature” engineered into the backup power systems.
- Owner did not receive training, did not have appropriate knowledge, and had not been informed of its existence, thereby defeating the purpose of the data center.





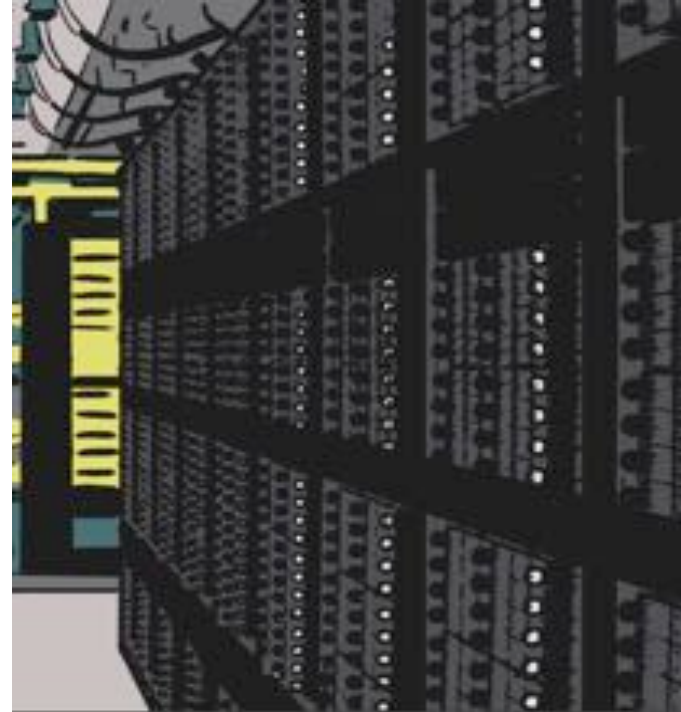
# Capital project in Europe 2016

- Service work on the power systems required placing a screwdriver on a live 400-volt connection.
- Additional failures discovered, due to incorrect fuse ratings and errors in the building monitoring and automation system.
- Any of those three issues would have resulted in a service interruption of the new data center.



# Capital project in Africa 2016

- A data center owner commissioned a international engineering firm to design and deliver a Tier III data center for critical infrastructure for banking.
- The initial designs did not meet Tier III topology standard and left the facility open to failure.
- Design documentation was adjusted based on Uptime Institutes recommendations and changed to help meet the business objectives.



# Capital project in Africa 2016

- An in-house team designed a Tier IV data center for a government department.
- After review the design was revealed as 'over engineered' Components of the designed were removed to reduce complexity of design while not impacting Tier objective.
- UI conducted site visited to audit progress of build by third party and to ensure data center was built 'as designed'.
- Cost saving on \$200,000 were realized.



## **Any questions?**

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# Thank-You



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