Trends for 2017 and Beyond: Our Data Center Industry Survey

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The Global Data Center Authority
2016 IT SURVEY

Current state and future trends
Voice of the Enterprise: Datacenter Transformation

Voice of the Enterprise: Datacenter Transformation provides you with actionable data and insight to understand the key dynamics driving the enterprise datacenter market.

Combining 451 Research’s industry-leading analysis with an extensive network of over 50,000 senior IT professionals, Voice of the Enterprise: Datacenter Transformation tracks the disruption occurring in the market and exposes the major opportunities for enterprises, IT vendors, suppliers and investors.

Voice of the Enterprise: Datacenter Transformation Vendor Evaluations 2016 includes:

- Over 1,000 quarterly web-based surveys with IT end-user decision-makers on a worldwide basis.
- 20 interviews quarterly with leading-edge senior IT executives, providing a ‘narrative’ view of the market.
- Sampling that is a representative of small, midsize and large enterprises in private and public sectors.
- Data-driven deliverables for fast access and ability to perform segmentation work.
Methodology

451 Research has a panel of highly accredited datacenter decision makers that participate in surveys focused on enterprise IT trends. This proprietary panel consists of 50,000+ IT decision-makers worldwide. Respondents from this datacenter survey are members of the panel that qualified based on their expertise in their organizations datacenter and facilities footprint and knowledge about their IT infrastructure.

Respondents from this datacenter survey are members of the panel that qualified based on their expertise in their organizations datacenter and facilities footprint as well as the IT infrastructure stack. Sampling varies across small, midsize, large and public sector as well as across vertical industries. The Voice of the Enterprise: Datacenters Vendor Evaluations 2016 survey wave was conducted during the months of November and December 2016. It represents over 1,000 completed surveys and 20 hour-long interviews from pre-qualified IT decision-makers primarily based in North America, Europe and Asia. In addition to regular quarterly topics, this survey focuses on customer ratings of leading vendors before and after implementation, skillset gaps, colocation spending trends, cloud and datacenter building plans.

Definitions: Datacenter Type

<table>
<thead>
<tr>
<th>Datacenter Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Centralized Datacenters</td>
<td>Considered a mission-critical, purpose built facility that typically centralizes IT systems providing services across an entire organization. Many levels of redundancy for power and cooling, with few or no single points of failure.</td>
</tr>
<tr>
<td>Regional Datacenters</td>
<td>Facility for housing IT systems typically providing services for a defined organizational purpose, and often for a regional presence. Multiple power and cooling sources, often with multiple single points of failure.</td>
</tr>
<tr>
<td>Local Datacenters</td>
<td>Facility for housing IT systems providing services for a small number of users. Significant redundancy for power and cooling distribution. Singular source of power and cooling.</td>
</tr>
<tr>
<td>Server Room</td>
<td>Dedicated computer room with some power and cooling; typically within an office environment. Minimal redundancy for power and cooling distribution.</td>
</tr>
<tr>
<td>Server Closet</td>
<td>Small room or closet with little to no redundancy power and cooling distribution. Singular source of power and cooling.</td>
</tr>
</tbody>
</table>
1,000 Survey Responses from 2016

Job Function
- 33% Executive
- 34% IT Management
- 33% Facilities Management

Location
- U.S. and Canada 40%
- Europe 22%
- APAC 13%
- Africa and Middle East 12%
- Latin America 10%
- Russia and CIS 3%

Verticals
- Colocation or Multi-tenant 26%
- Data Centers 26%
- Financial 18%
- Telecommunications 14%
- Government 10%
- Manufacturing 6%
- Utilities/Energy 6%
Where are your current IT assets located?
Estimate percentages:

- Enterprise-owned Data Center 71%
- Colocation or Multi-tenant Data Center Provider 20%
- Cloud Computing 9%
2016 Data Center Industry Survey

- Enterprise IT budgets and server footprints are in decline. Outsourcing is rampant in the face of opaque costs and chronically poor capacity planning.

- IT organizations are partnering with Corporate Sustainability, but the efforts are still primarily focusing on least impactful aspects of efficiency.

- “Nothing is less productive than to make more efficient what should not be done at all. -- Peter Drucker”
Major changes on the horizon

Half of the enterprise’s Senior Execs expect the *majority* of their IT workloads to reside *off-premise* in the future.

Of those respondents, around *70%* expect that shift to happen by *2020*.

*23%* expect it to happen by next year.
Hybrid infrastructure models now the norm

75% of enterprise IT organizations deploy compute workloads outside of their own data centers
85% IT depts deploy colo or cloud computing

54% had no confidence in their ability to compare cost and performance outsourcing alternatives
What is driving your organization’s decrease in data center facility spending in 2016? 53% of respondents cited increased reliance on cloud service providers.

Only 16% of respondents reported having no plans for cloud computing deployments.
Top drivers for off-premise computing

- Reduce churn of non-critical workloads into critical space
- Mergers/Acquisitions activity
- Disaster recovery on separate power grid
- Executive directive to divest owned data center infrastructure
- Global expansion
- Avoid large capital expenses of new site build
- Not core business
- Lack of confidence in staff/resources
- Speed and cost of deployment
VotE – Data center management will become data-driven and cloudy

• The advent of cloud-based management services for datacenters will begin to transform manual on-premises approaches into remote, data-driven ones.

• Suppliers with broad cloud and on-premises services capabilities will increasingly pursue cloud-based service offerings; it will begin slowly in 2017, gradually putting increased competitive pressure on smaller players.

• Skillsets of Data Center managers and executives must shift; analytics, data driven model and require better DCIM for existing assets
VotE – New approaches to resiliency will gain ground

- Service providers and enterprise CIOs are under pressure to reduce datacenter capital and operating costs while maintaining or even improving on high levels of availability.

- Encouraging the adoption of a range of technologies and strategies; cloud technologies, in particular, are enabling service providers to build resiliency – including disaster recovery – at the network and software level using distributed replication.

- In 2017, the groundwork will be laid for a long-term shift toward IT-based, intelligent resiliency with ever more products, services and initiatives.

- Suppliers and Operators are unsure of impact
Q2. What is currently the top priority for your organization’s IT environment?

<table>
<thead>
<tr>
<th>Priority</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respond Faster to Business Needs</td>
<td>31.3%</td>
</tr>
<tr>
<td>Improve Reliability and Availability</td>
<td>21.6%</td>
</tr>
<tr>
<td>Decrease Costs</td>
<td>20.2%</td>
</tr>
<tr>
<td>Improve Security</td>
<td>14.9%</td>
</tr>
<tr>
<td>Expand/Deploy New Capacity</td>
<td>9.1%</td>
</tr>
<tr>
<td>Other</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

n = 1,037
Q3. Which of the following IT infrastructure projects is your organization executing over the next 90 days? Please select all that apply.

<table>
<thead>
<tr>
<th>IT Infrastructure Projects – Next 90 Days</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Upgrades</td>
<td>46.4%</td>
</tr>
<tr>
<td>Systems Infrastructure Upgrade/Refresh</td>
<td>45.7%</td>
</tr>
<tr>
<td>New Software Application Deployment</td>
<td>32.1%</td>
</tr>
<tr>
<td>Add Systems Infrastructure Capacity to Support Growth</td>
<td>31.2%</td>
</tr>
<tr>
<td>IT Infrastructure Consolidation</td>
<td>30.4%</td>
</tr>
<tr>
<td>Off-Premises Cloud Deployment</td>
<td>28.8%</td>
</tr>
<tr>
<td>Server Virtualization Deployment</td>
<td>25.5%</td>
</tr>
<tr>
<td>Disaster Recovery Deployment</td>
<td>21.7%</td>
</tr>
<tr>
<td>Datacenter Migration or Integration</td>
<td>17.7%</td>
</tr>
<tr>
<td>On-Premises Private Cloud Deployment</td>
<td>13.6%</td>
</tr>
<tr>
<td>Converged Infrastructure Deployment</td>
<td>12.2%</td>
</tr>
<tr>
<td>Colocation Deployment/Expansion</td>
<td>11.3%</td>
</tr>
<tr>
<td>New Datacenter Buildout/Expansion</td>
<td>11.0%</td>
</tr>
<tr>
<td>Expand IT Outsourcing Initiatives</td>
<td>9.3%</td>
</tr>
<tr>
<td>Containers Deployment/Expansion</td>
<td>8.0%</td>
</tr>
<tr>
<td>Other</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

Percent of Sample: n = 728
Q7. How would you characterize your organization’s IT infrastructure spending plans over the next 90 days compared to the previous 90 days? This includes spending on servers, storage, networking, etc.

- **Significant Increase** (7.9%)
- **Slight Increase** (29.5%)
- **Remain the Same** (46.7%)
- **Slight Decrease** (12.6%)
- **Significant Decrease** (3.3%)

Percent of Sample

\[ n = 610 \]
Q8. Approximately, how is your organization’s overall 2016 IT and facilities budget distributed across the following categories?

- Staff/Labor Costs: 30.0%
- Datacenters and Facilities (Including Colocation): 12.8%
- Software and Applications: 15.0%
- Server Infrastructure: 10.1%
- Storage Infrastructure: 8.2%
- Networking Infrastructure: 8.3%
- Cloud Services (IaaS, PaaS, SaaS, Hosting, etc.): 9.5%
- IT Outsourcing (Managed Service Providers): 6.1%

Mean: n = 477
Q10. Which of the following infrastructure systems does your organization have installed today or expect to deploy over the next 90 days? Please select all that apply.

<table>
<thead>
<tr>
<th>Infrastructure Systems</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking Switches/Routers (Hardware)</td>
<td>78.4%</td>
</tr>
<tr>
<td>x86 Servers</td>
<td>76.4%</td>
</tr>
<tr>
<td>Server Appliances (Networking, Security,...)</td>
<td>66.3%</td>
</tr>
<tr>
<td>Disk-Based Storage Array (SAN, NAS)</td>
<td>65.6%</td>
</tr>
<tr>
<td>All Flash Storage Array</td>
<td>27.8%</td>
</tr>
<tr>
<td>Converged Infrastructure</td>
<td>25.8%</td>
</tr>
<tr>
<td>Mainframe (e.g. IBM z Systems)</td>
<td>20.2%</td>
</tr>
<tr>
<td>RISC-Based Servers (e.g. Power, SPARC)</td>
<td>17.5%</td>
</tr>
<tr>
<td>White-Box (Unbranded) IT Infrastructure</td>
<td>8.6%</td>
</tr>
<tr>
<td>ARM-Based Servers</td>
<td>2.9%</td>
</tr>
<tr>
<td>Other</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Percent of Sample: 593
Q17. Which of the following datacenter projects are high priorities for your organization over the next 90 days? Please select all that apply.

<table>
<thead>
<tr>
<th>Datacenter Projects</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving Existing IT Asset Utilization (e.g., servers, storage)</td>
<td>44.0%</td>
</tr>
<tr>
<td>Datacenter Consolidation</td>
<td>25.8%</td>
</tr>
<tr>
<td>Upgrading/Retrofitting an Existing Facility</td>
<td>22.6%</td>
</tr>
<tr>
<td>Aligning Datacenter Processes Across IT and Facilities Groups</td>
<td>21.7%</td>
</tr>
<tr>
<td>Closing Down Excess Capacity</td>
<td>14.1%</td>
</tr>
<tr>
<td>Upgrading Power &amp; Cooling Equipment</td>
<td>12.0%</td>
</tr>
<tr>
<td>Outsourcing Datacenters to a Third-Party Provider</td>
<td>9.8%</td>
</tr>
<tr>
<td>Building or Buying a New Datacenter</td>
<td>9.2%</td>
</tr>
<tr>
<td>Leasing Additional Colocation Space</td>
<td>7.6%</td>
</tr>
<tr>
<td>Other</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

n = 368
Q24. Approximately what percentage of your IT footprint is deployed at colocation providers?

<table>
<thead>
<tr>
<th>Proportion of IT Footprint Deployed at Colocation Providers</th>
<th>Respondents Familiar With IT Infrastructure or Datacenter Facilities and IT Sites and Rent Space at Colocation Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>91% - 100%</td>
<td></td>
</tr>
<tr>
<td>81% - 90%</td>
<td></td>
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<tr>
<td>71% - 80%</td>
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<tr>
<td>61% - 70%</td>
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<tr>
<td>51% - 60%</td>
<td></td>
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<tr>
<td>41% - 50%</td>
<td></td>
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<tr>
<td>31% - 40%</td>
<td></td>
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<tr>
<td>21% - 30%</td>
<td></td>
</tr>
<tr>
<td>11% - 20%</td>
<td></td>
</tr>
<tr>
<td>0% - 10%</td>
<td></td>
</tr>
</tbody>
</table>

Percent of Sample

Mean: 44.7%
Median: 40.0%

n = 290
Q45. Which of the following best describes your organization’s approach to NEW technology?

- We are early adopters on the leading edge: 12.1%
- We are pragmatic about new technology, but will act sooner rather than later: 48.3%
- We are conservative about new technology and take a wait-and-see approach: 32.0%
- We are skeptical and are usually late to the game: 7.6%

Percent of Sample: n = 813
Trends and Observations

• Hybrid IT is here, however, trends do not translate into governance and add complexity to the IT delivery model.

• IT and infrastructure roles will need to pivot to evaluate and manage cloud and colocation providers effectively.

• Modern, resilient, multi-site IT strategies encounter problems for the same reasons as 25 years ago – infrastructure and human error.

• The rise of corporate sustainability in IT will grow.
New data from surveys and field reports

Business impacts and outages are still rampant
Survey Stats: Outages Still Rampant

- Nearly 50% of Enterprise IT organizations responding to *Uptime Institute’s Annual Industry Survey* experienced a business impacting outage in their own data centers in a 12 month period.

- Nearly 1/3 had experienced a business impacting outage at a colocation provider’s site.
But colocation is not a panacea

Over 40% of enterprises are paying more for colocation than they initially expected

Nearly one-third have experienced an outage at a colocation or MTDC provider

Over 60% say that the SLA penalty clause does not adequately offset the cost of an outage
Data center projects often have “issues”

More than 70 percent of projects fail Tier Certification assessments during the first round of demonstrations, requiring the owner to invest more time and resources to remediate the problem.
Recent Analysis of 200+ Tier Certifications:

• The vast majority of even the world’s most elite data center sites do not operate as designed/installed on day one.

• Data center owners comment that the Tier Certification demonstrations were more rigorous than their commissioning program.

• Tier Certification is a failsafe against a data center that doesn’t work day 1, or worse in year 5.
Why do such expensive investments have problems?

With multiple vendors, subcontractors, and typically more than 50 different disciplines involved in any data center project—structural, electrical, HVAC, plumbing, fuel pumps, networking, and more—it would be remarkable if there were no errors introduced or corner cut during the construction process.
Root causes of capital project problems

- Lack of clear project direction and sequencing from basis of design thru construction
- Design disciplines not integrated
- Lack of experienced project management and construction team
- Electrical and mechanical systems with misaligned capacity
- Lack of a rigorous change management program
- CX compressed or not thorough
- Phasing – adds complexity and CX challenges
Time and Budget for Commissioning

Many problems observed in operational facilities could have been identified and remediated during a thorough commissioning process.

• The integrated systems testing would have already exercised all of the components as though the data center were operational.

• Load banks simulating IT equipment should be installed in the data center to fully test the power and cooling.

• The systems are operated together to ensure that the data center operates as designed in all specified maintenance and failure scenarios.

• Everything should be running exactly as specified, and changes from the design should be minimal and insignificant.
Phasing: Good for the finance team on day 1, but introduces risk for occupants

• Bringing new phases online can cut into a live site’s power, cooling and ancillary infrastructure

• Later phases are often not fully commissioned. Capacity and/or topology you purchased or leased is not really there

• Lurking design or construction flaws may not reveal themselves until years later with no one onsite who has ever experienced that problem
There is a data center somewhere...

Cloud outages are traced to physical infrastructure: design engineering or facilities management failures
Hybrid world needs a layer of infrastructure & operational consistency
Multi-site management is exponentially more difficult than managing a single site

- Technical complexity multiplies as you move to different sites, regions, and countries where codes, cultures, climates and other factors are different.
- Organizational complexity complicates matters when assets in your portfolio are owned or operated by another party.
To manage a diverse portfolio of assets, IT infrastructure execs need:

• Common basis for evaluation and discussion of organizational effectiveness.

• Measurements and evaluations that will be tracked over time to ensure continuous improvement.

• A framework to drive global standardization and optimization of processes and service quality across the organization.
Future Trend

Corporate Sustainability’s impact on IT
Infrastructure realizes business functions need to be part of the discussion

Which of these business functions or departments should be involved in your major IT infrastructure decisions, but are consistently absent from the process? (Select all that apply)

1. Finance
2. Risk
3. Sustainability
Good news: Corporate Sustainability

76% of enterprise organizations report having a defined and funded corporate sustainability program

Of those, 70% of IT departments actively participate in the sustainability efforts
Positive experience in IT-Sustainability Partnership so Far

73% report that sustainability executives understand the data they provide and use it properly.

44% of respondents report having a beneficial relationship with corporate sustainability.

Less than 10% of respondents claim sustainability efforts pose a risk to IT performance or create needless work.
Opportunity is here, still missing the target

IT reports to sustainability include

Total IT or data center power consumption **80%**

PUE **66%**
Trends moving forward

• Hybrid IT architecture is here, adding complexity to already challenged data center industry

• The vast majority of even the world’s most elite data center sites do not operate as designed/installed on day one. However, reliability will continue to be imperative!

• Corporate sustainability departments are well-positioned to partner with IT teams, but need to move past PUE as the most important metric to measure IT sustainability.
Questions?

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