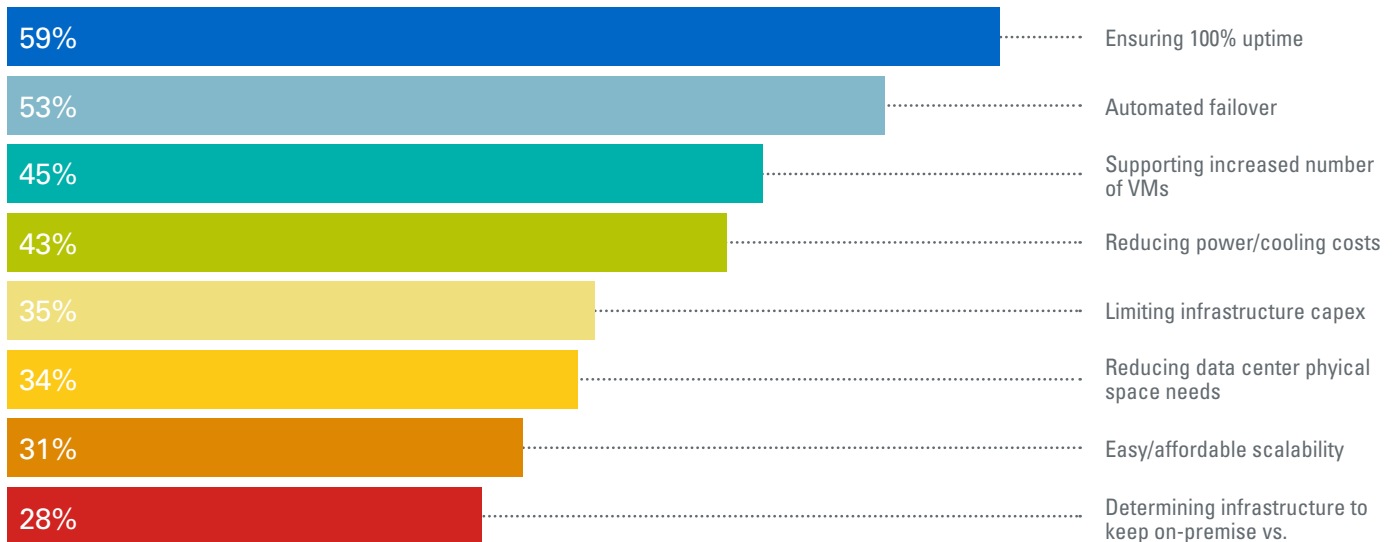


How 'Software-Defined' Is Redefining the Modern Data Center

Modern data centers are being transformed in dramatic fashion. No longer singular, monolithic and inflexible designs, today's data centers are influenced by "software-defined" concepts such as pooling, virtualization and abstraction. As a result, software-defined data centers are increasingly becoming the norm for IT organizations looking to reduce infrastructure costs, improve resiliency against unplanned service outages and make IT resources easier to manage and scale.



Which of the following are significant challenges in managing your data center?



Data centers are also being influenced by a relatively new concept: software-defined power. As more and more infrastructure has become virtualized and delivered as a service, organizations still have had to overcome power and cooling challenges as a major contributor to downtime. “Most data center infrastructures are designed for peak load capacity that is structured for cyclical or seasonal workloads,” according to David Linthicum, senior vice president at Cloud Technology Partners, an IT consulting and research organization.¹ By abstracting power away from physical assets, IT organizations reap the benefits of dynamic workload distribution, enhanced resource-consumption planning, automated response to environmental changes and rapid alignment with power needs brought on by new application demands, he added.

By moving to a “software-defined” paradigm in the data center, organizations are seeing efficiency gains in both IT service delivery and power/cooling consumption. This ability to provide both improved reliability and increased efficiency is a powerful combination that is extremely attractive to data center managers.

Now, new research indicates that IT organizations are evolving their data centers and power management based on a software-defined model in order to improve operational flexibility, adapt to budget realities around lower infrastructure

spending and buttress their assets against unplanned downtime. The research, based on 115 responses from registered members of SearchDataCenter.com, indicates that IT professionals are:

- Taking a thoughtful, long-term and strategic approach to safeguarding their data centers against unplanned outages, such as adding new data centers in remote locations.
- Beginning to embrace software-defined concepts, although they still haven’t made it a universal trend.
- Making power consumption and power management issues a higher priority when deploying new IT initiatives.

Data Center Management Challenges

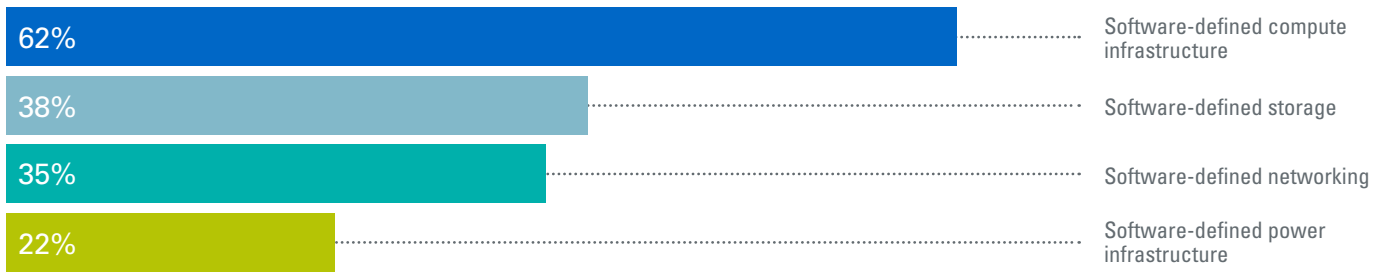
Anyone who has read recent news reports knows the impact of IT service interruptions on an organization’s business performance. Downtime costs huge amount of money, measured in lost sales and direct costs to remediate problems. But downtime also carries significant indirect costs such as lost brand reputation, weakened competitive position and lower customer confidence.

Survey respondents cited downtime-related issues as their top challenges in managing their data centers: Ensuring 100% uptime and automated failover in the event of a service interruption headed a list of eight different challenges by a significant margin.

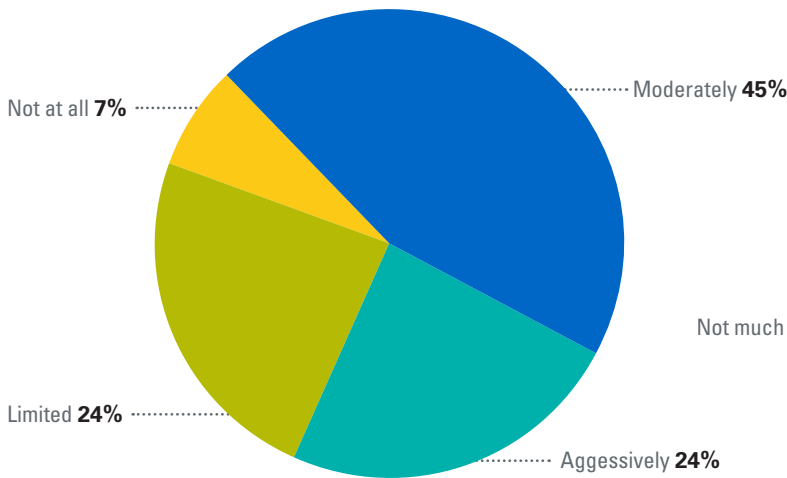
PROFILE OF SURVEY RESPONDENTS’ ORGANIZATIONS

- 34% manage racks in multiple locations or in a colocation arrangement.
- Single-location data center managers oversee an average of 46 racks.
- 62% of data center racks are currently occupied.
- 48% say their IT operations are widely virtualized; another 41% say virtualization adoption is increasing.
- 65% say virtualization adoption has resulted in lower data center power consumption.
- 37% suffered an unplanned outage in the past 12 months; 32% of respondents said those outages last more than four hours.

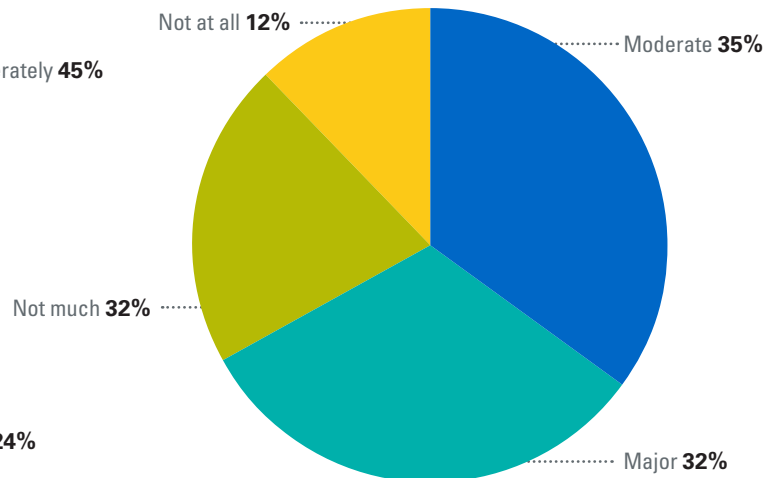
Has your organization adopted any of the following in your data centers?



How extensively has your organization adopted software as a key element in ensuring business continuity?



How extensive a challenge is it for you to automatically migrate VMs to another data center if you suffer a service interruption?



The Software-Defined Architectural Paradigm

IT organizations have been embracing software-defined infrastructure solutions for their data centers for some time, and have been making more moves lately to elevate software to an essential role in ensuring business continuity. In fact, the majority of respondents already have adopted at least some form of software-defined infrastructure in their data centers, and many have begun utilizing multiple forms of software-defined solutions.

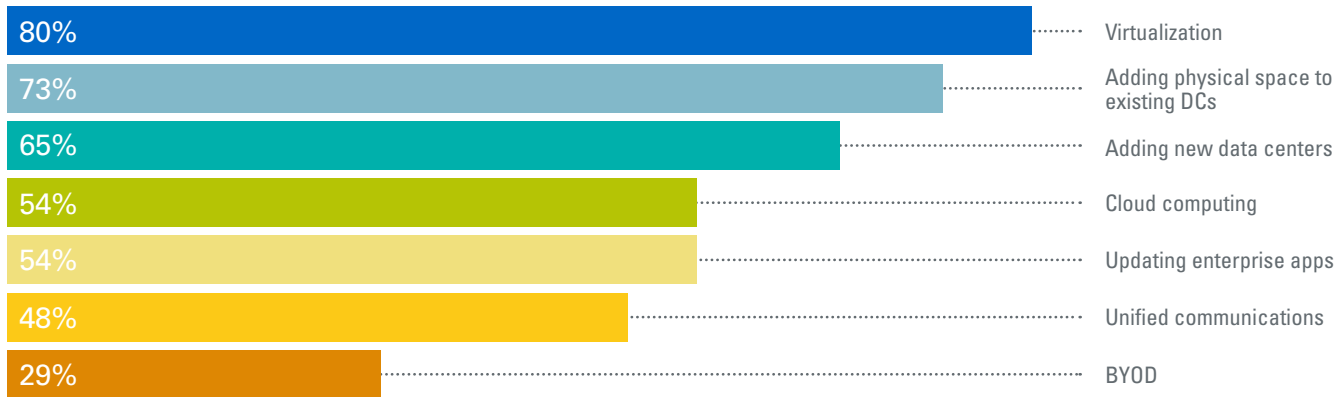
Software-defined solutions are specific manifestations of a bigger trend: the

increased utilization of all kinds of software in the data center for business continuity requirements. This makes sense, considering that organizations that in the past may have opted for increased and modernized data center hardware infrastructure for improved resiliency are now under pressure to reduce capital expenses. Most respondents agreed that software has become critical to their business continuity strategies to at least a moderate degree, although nearly a third of the respondents said their organizations have used software strategies for business continuity either to a limited degree or not at

all. Clearly, this is an area where IT professionals need more awareness and understanding of the benefits of software-driven strategies in business continuity.

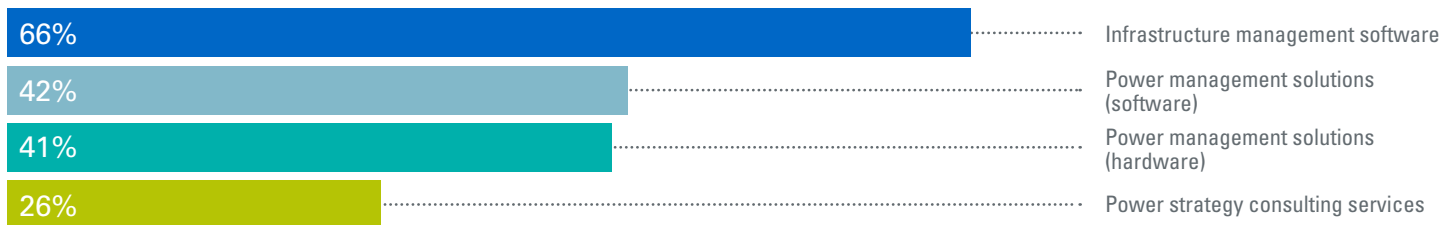
Another proof point for the need for more software-centric strategies to handle unplanned downtime is how challenged respondents said they feel when it comes to automatic migration of virtual machines (VMs) to another data center in a service interruption. In fact, most respondents said automated migration of VMs to another data center would be either a major or moderate problem.

Did you take into account power management concerns when you adopted any of the following IT initiatives? (% answering “yes”)



How Familiar Are You With Each of the Following?	Very Familiar	Somewhat Familiar	Not Very Familiar	Not Familiar At All
Power management as a service	13%	38%	26%	23%
Software-defined power	15%	35%	27%	23%
Financial credit availability from utilities for data center efficiency	19%	28%	29%	24%

Which of the following have you adopted in the past year or are considering adopting in the next 12 months?



Power Management in the Data Center

The ever-increasing unit costs for power and cooling in data centers certainly has gained the attention and concern of not only IT departments but also of business groups such as finance and operations. As a result, IT respondents have raised their awareness considerably on power-related issues when they have rolled out new IT initiatives.

As new techniques emerge as options for controlling power and cooling costs and complexity, it is apparent that IT organizations will need hand-holding and education about those techniques, their potential benefits and how to measure economic and operational return on investment. Many survey respondents are at least somewhat

familiar with these concepts, although many other respondents admit to having little or no familiarity with them so far.

Despite the need for more education on new options, power management clearly remains a major area of activity within IT organizations. Respondents indicate a sizeable and growing adoption trend for different types of data center power management steps.

Conclusion

Software-defined data centers are not just a utopian goal of visionary IT managers; they appear destined to become the standard in the very near future. Software-defined compute infrastructure already has been adopted by most survey respondents, and similar approaches for storage, networking and even power have now reached critical

mass and appear poised for increased utilization.

Although more awareness and education will certainly be necessary to help IT organizations commit to software-defined schemas, the potential benefits of lower capital expenses, more flexible data center design, improved resiliency, reduced power and cooling expenses, and easier data center infrastructure management are compelling. IT professionals who do their homework and can see the big-picture benefits are likely to help their organizations turn their data centers into strategic assets.

References

- [1] “The benefits and challenges of software-defined power,” Gigaom Research, April 23, 2014