Hyperconverged Infrastructure in the Modern Enterprise

Hyperconverged Infrastructure Use Cases

ActualTech Media

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Hewlett Packard Enterprise

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Introduction

Hyperconverged infrastructure — the melding together of servers and storage into a single appliance with streamlined management — is a technology growing in popularity even as people struggle to figure out exactly what it can do, what it can't do, and just how it impacts the IT organization.

In order to understand these items, ActualTech Media partnered with Hewlett Packard Enterprise and surveyed almost 550 information technology professionals. Respondents hailed from more than 40 different industries and represented companies of all sizes. People from across the spectrum — from CEOs to VPs of Infrastructure to IT Generalists — responded to our survey. In some cases, the respondent's role yielded interesting information, as you will learn later in this report.

We focused our analysis on three primary use cases: virtual desktop infrastructure (VDI), remote office/branch office (ROBO) deployments, and cloud computing.

In reality, VDI has been a natural fit for hyperconverged for quite some time, but is recently enjoying a resurgence as hyperconverged infrastructure vendors focus on the VDI offerings. ROBO is more recently coming into the market as a compelling use case for hyperconvergence because of the fact that hyperconverged infrastructure can solve many of the most pressing challenges — capacity, performance, scalability, and supportability — inherent in ROBO scenarios.

We further sought to learn about respondent feelings around cloud computing, both public and private.

About The Author

Scott Lowe is a partner in and co-founder of ActualTech Media. Scott has been in the IT field for close to twenty years and spent ten of those years in filling the CIO role for various organizations. Scott has written thousands of articles and blog postings over the years and regularly creates compelling new content for clients.

Key Findings

- For VDI deployments, on a percentage basis, more people are having trouble on hyperconverged infrastructure than on traditional infrastructure. Given that VDI has been discussed as one of the primary use cases around hyperconverged, these results were unexpected. It seems to indicate that hyperconverged infrastructure adopters are not realizing as much success with VDI as those that are building VDI environments on traditional hardware and software. Given the fact that many hyperconverged platforms started life as VDI solutions, this is an incredibly surprising discovery. However, there is an important caveat here. We do not believe that these results reflect on hyperconverged infrastructure, but are rather the result of other challenges, including the need to support graphics intensive applications to ensure end user satisfaction. VDI remains a complex use case with a lot of moving parts.
- Traditional ROBO deployment methods remain the choice for the vast majority of respondents (44%).
- 26% of respondents say that they are having trouble protecting data at ROBO sites. This is a critical problem and is serious. Data protection can make or break a business. We see opportunity for hyperconverged solutions that include data protection capabilities to fill this gap.
- More than 20% of respondents say that they are having problems at ROBO sites with compute and/or storage performance.

543 Respondents

22 Verticals

17 Countries

49 U.S. States

For the better part of a decade, analysts have talked about the "year of the virtual desktop." There have been countless articles written about the potential benefits of this technology. However, major challenges — particularly around storage (what about 'storage'?) — in the early days of this technology which prevented many such projects from coming to full fruition. While flash storage largely solved the technical performance issues, people discovered that virtualizing desktops was not as easy as it first appeared.

In fact, only a scant 3% of our survey respondents have virtualized their entire desktop environment. However, 49% have virtualized *some* of their desktop environment, leaving 49% with no VDI penetration at all. Over time, the number of deployments should rise, particularly considering that one of the original suggested use cases of hyperconvergence revolved around VDI. We don't expect to see the number of environments doing 100% VDI to rise that dramatically as there will almost always be a need for some physical desktops to support high I/O or high resource need applications.

Are you running virtual desktop infrastructure (VDI)/ End user computing/Mobility?

Yes; we run our entire desktop environment on VDI
3%

No
48%

Yes; we run some of our desktop environment on VDI
49%
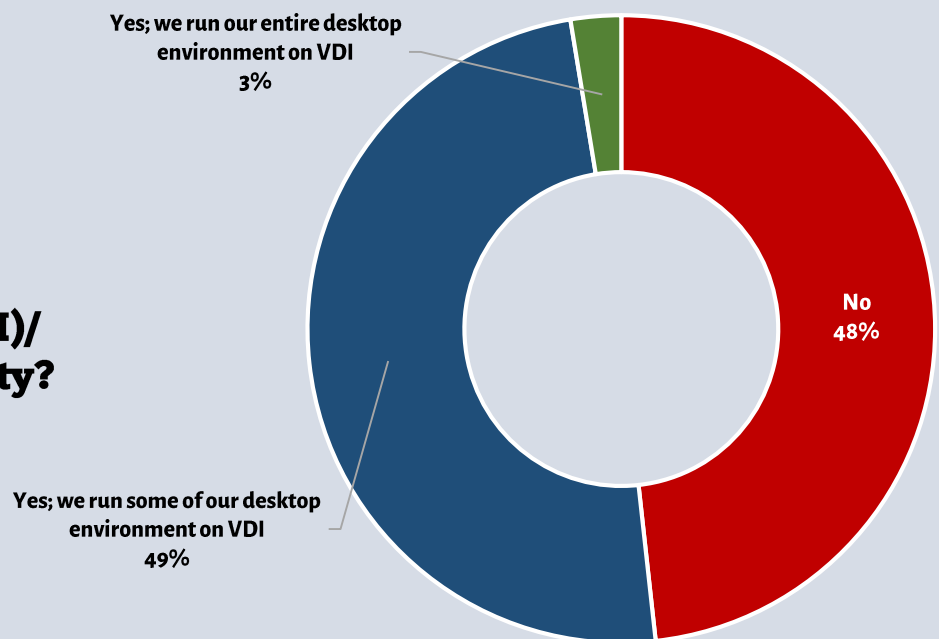
Figure 1: Virtual desktop infrastructure deployment status

Considering VDI deployments by company size shows that larger companies are considerably farther along than smaller companies in this space. Given the technical and licensing challenges that can accompany VDI, this isn't particularly surprising. Although the original promises around VDI were simplicity and cost savings, reality proved to be something very different as companies struggled with technical issues and discovered hidden licensing challenges. Today, VDI sits alongside traditional desktops as one option among many for managing the enterprise desktop. Smaller companies have probably discovered that, for the most part, there is little to no cost savings in smaller VDI deployments and that the complexity can outweigh any potential savings.

Are you running virtual desktop infrastructure (VDI)/end user computing/mobility (by company size)

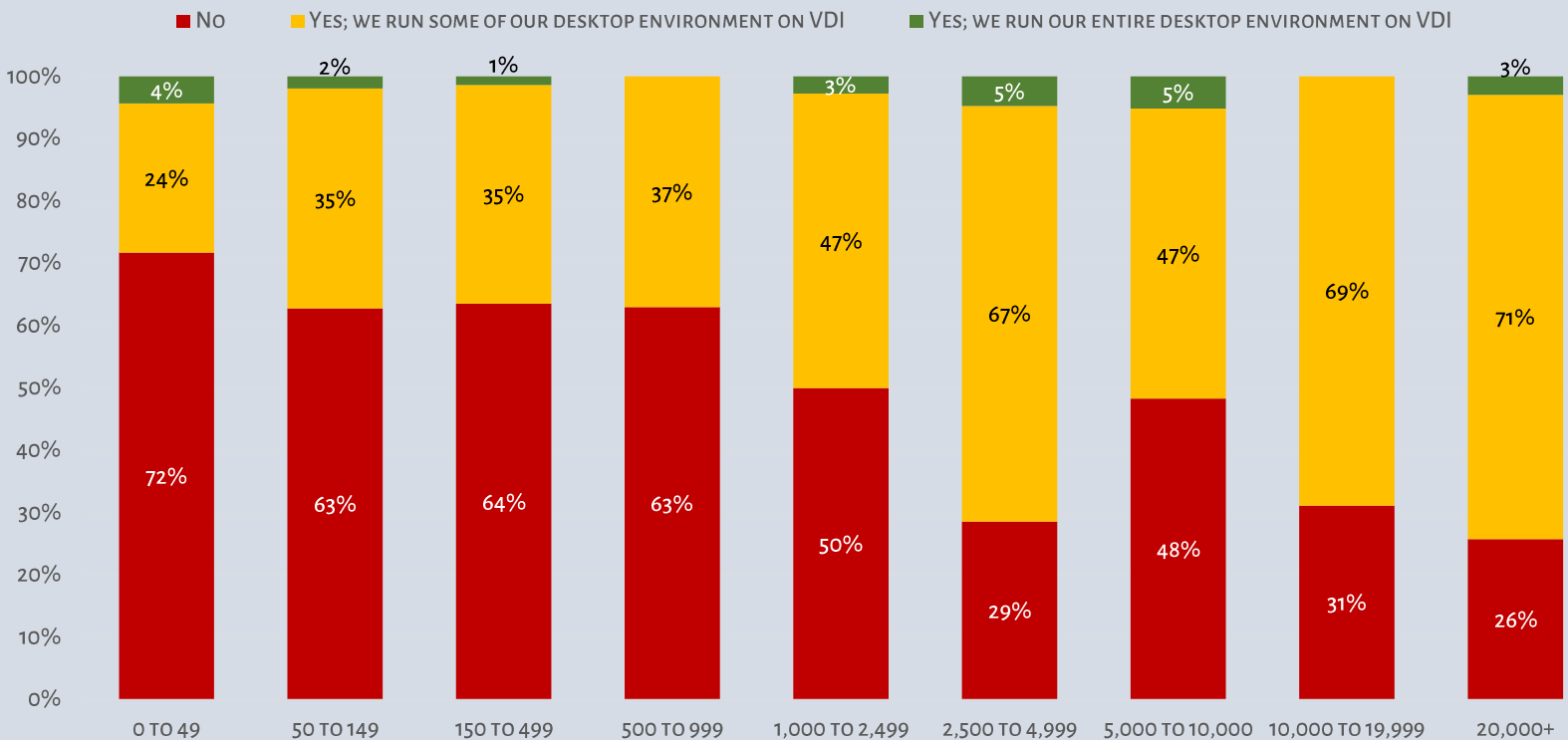Figure 2: Virtual desktop infrastructure deployment status by company size

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In what was something of a surprise, a number of respondents that have deployed VDI on hyperconverged infrastructure are experiencing capacity or performance issues with their environments (Figure 3, 15%). In fact, that's six points higher than those having a positive experience (9%). When comparing to traditional infrastructure, 31% are experiencing VDI problems versus 44% that are not. In other words, on a percentage basis, more people are having trouble on hyperconverged infrastructure than on traditional infrastructure. Given that VDI has been discussed as one of the primary use cases around hyperconverged, these results were unexpected. It seems to indicate that hyperconverged infrastructure adopters are not realizing as much success with VDI as those that are building VDI environments on traditional hardware and software. Given the fact that many hyperconverged platforms started life as VDI solutions, this is an incredibly surprising discovery.

Here's the situation, though. After speaking personally with some of the respondents that cited challenges with VDI in their hyperconverged infrastructure environments, we do not believe that there is a "fatal flaw" that negates the use of hyperconverged infrastructure in VDI deployments. Instead, we see a need for VDI planners and vendors providing VDI solutions to better understand the needs of end users, particularly as it pertains to graphics acceleration. VDI remains an area of high interest, but also high complexity.

Which statement best describes your overall experience with your VDI environment?

We run our VDI environment on hyperconverged infrastructure and are experiencing no problems
10%

We run our VDI environment on traditional infrastructure and are experiencing performance or capacity challenges
31%

We run our VDI environment on hyperconverged infrastructure and are experiencing performance or capacity challenges
15%

We run our VDI environment on traditional infrastructure and are experiencing no problems
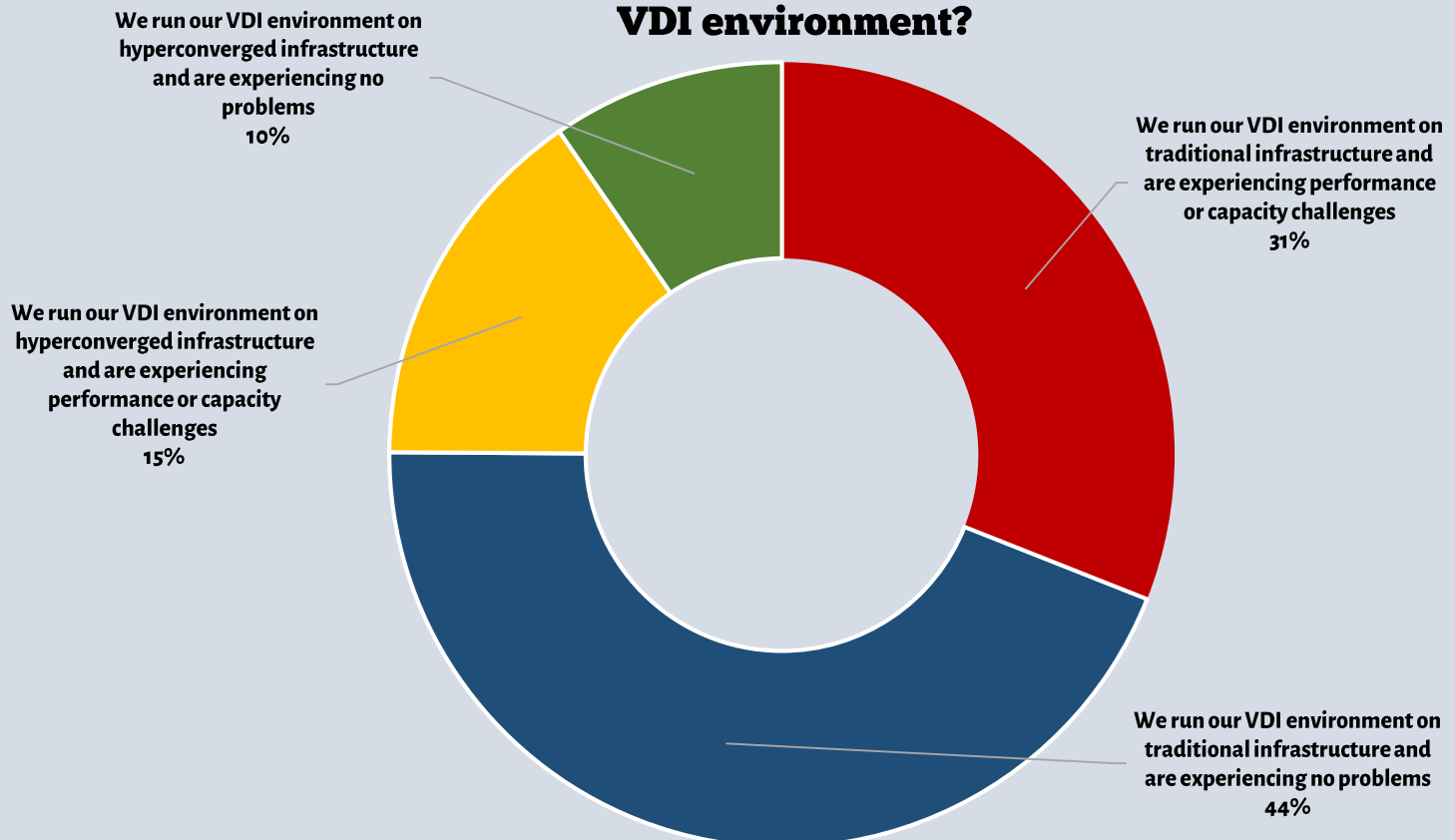**44%**

Figure 3: Understanding VDI deployment characteristics

Often, outcomes are all about perception. Different people see different things depending on their view of the organization. In Figure 4, you can see that people's experience with VDI different in many ways. At first glance, you will see that storage administrators have had considerable positive experience with traditional infrastructure (64% say that they are having no trouble on VDI) but those that are running VDI on hyperconverged infrastructure are experiencing capacity or performance challenges (27%). Only business decision makers see similar challenges on hyperconverged infrastructure. Please bear in mind that the sample size for storage administrators is relatively small and may be skewing the results, but you can see the difference in experience based on organizational role.

Which statement best describes your overall experience with your VDI environment?

- ■ WE RUN OUR VDI ENVIRONMENT ON TRADITIONAL INFRASTRUCTURE AND ARE EXPERIENCING PERFORMANCE OR CAPACITY CHALLENGES
- ■ WE RUN OUR VDI ENVIRONMENT ON TRADITIONAL INFRASTRUCTURE AND ARE EXPERIENCING NO PROBLEMS
- ■ WE RUN OUR VDI ENVIRONMENT ON HYPERCONVERGED INFRASTRUCTURE AND ARE EXPERIENCING PERFORMANCE OR CAPACITY CHALLENGES
- ■ WE RUN OUR VDI ENVIRONMENT ON HYPERCONVERGED INFRASTRUCTURE AND ARE EXPERIENCING NO PROBLEMS

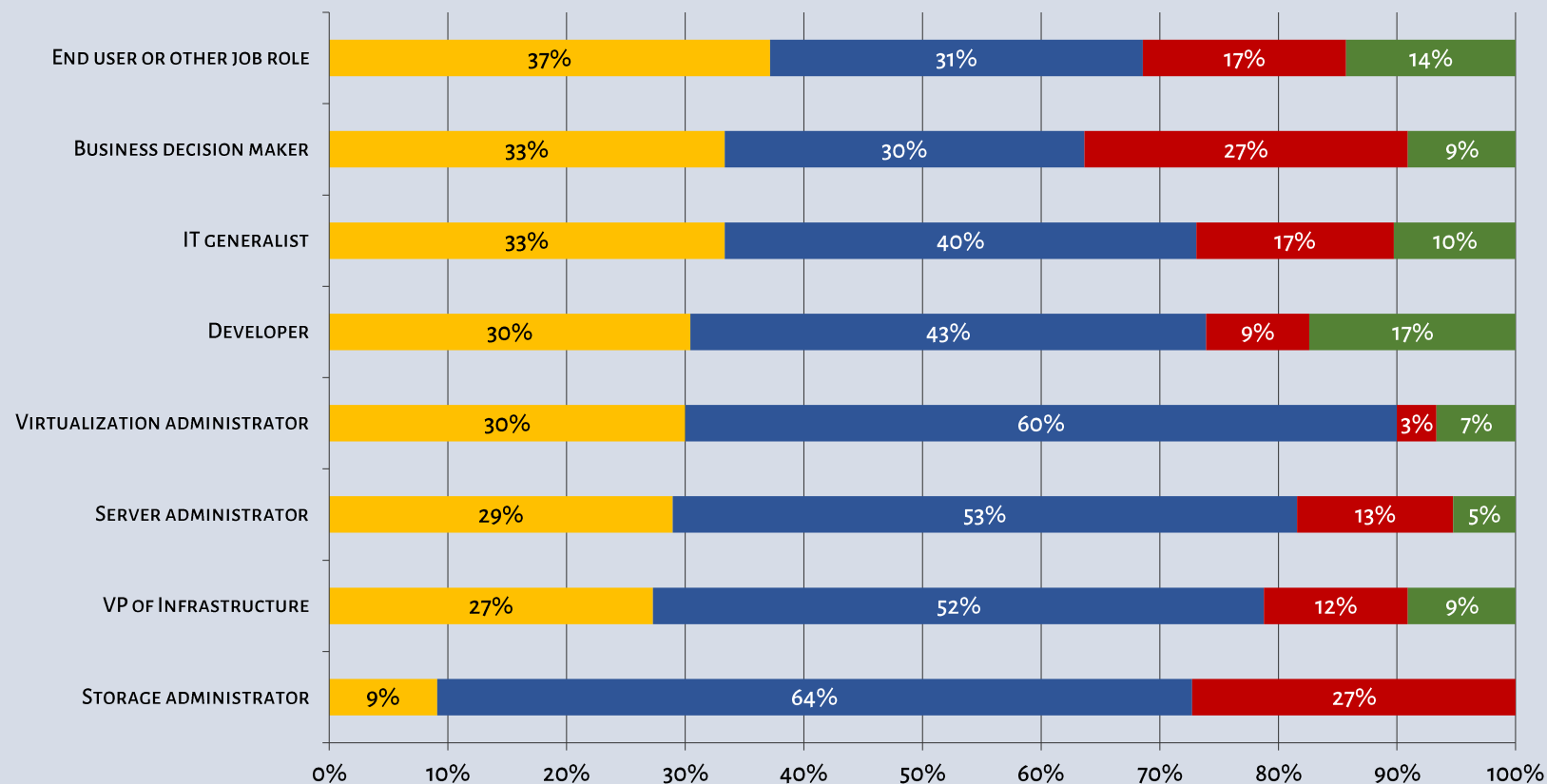| Job Role	Traditional – Challenges	Traditional – No Problems	Hyperconverged – Challenges	Hyperconverged – No Problems
END USER OR OTHER JOB ROLE	37%	31%	17%	14%
BUSINESS DECISION MAKER	33%	30%	27%	9%
IT GENERALIST	33%	40%	17%	10%
DEVELOPER	30%	43%	9%	17%
VIRTUALIZATION ADMINISTRATOR	30%	60%	3%	7%
SERVER ADMINISTRATOR	29%	53%	13%	5%
VP OF INFRASTRUCTURE	27%	52%	12%	9%
STORAGE ADMINISTRATOR	9%	64%	27%	

Figure 4: Virtual desktop infrastructure deployment perceptions by job role

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VDI Usage Needs

People use their VDI environments to serve different purposes. In general, there are three different ways to leverage such environments:

- Single applications. For example, users in many call centers require access to only one or two applications at a time. In such environments, the VDI architecture needs to support a limited set of applications. In our survey, 41% of respondents using VDI indicate that they need to support such use cases.
- General desktops (multiple applications). For most organizations, the general-purpose desktop still rules the day. Users in these companies need to be able to access a variety of applications on demand. Applications may include Microsoft Office, ERP clients, and web browsers, among many more. 71% of those running VDI environments need to be able to support this general purpose use case.
- Full graphics acceleration. There remain a number of tools that require access to dedicated graphics resources. Such tools might include CAD applications and video editors. Just 11% of those supporting VDI need access to this increased graphics processing power.

Note that we allowed respondents to provide multiple answers to this question. Many organizations need to deploy different kinds of virtual desktop environments for different kinds of users.
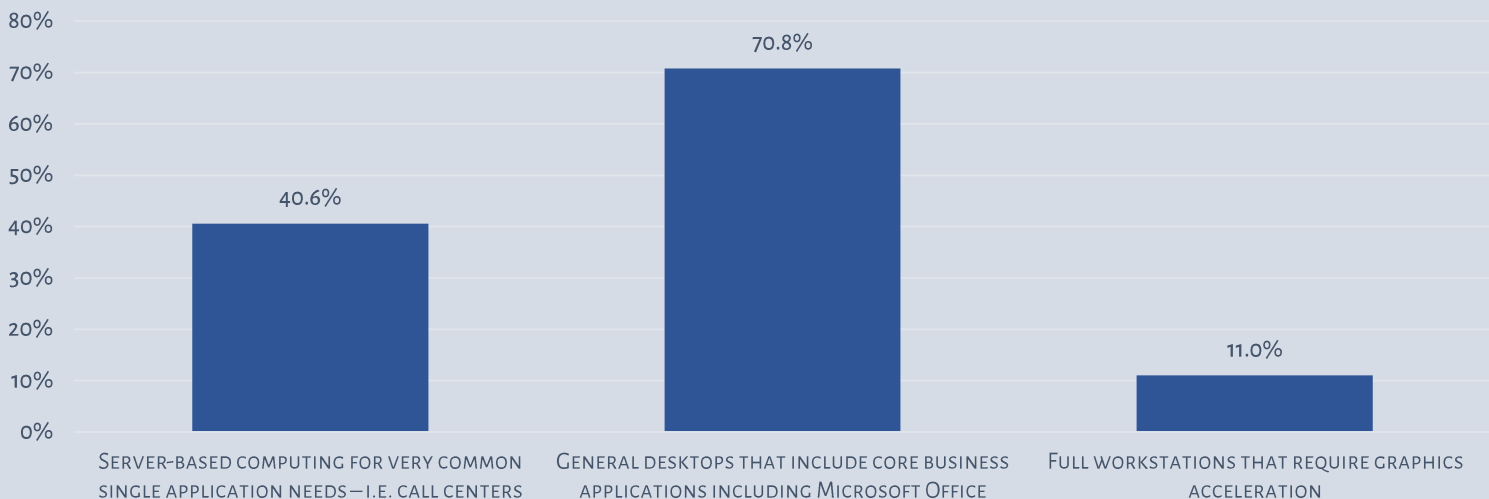
Which statements best describes your VDI environment?

Figure 5: VDI computing environment details

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Key Findings

- For VDI deployments, on a percentage basis, more people are having trouble on hyperconverged infrastructure than on traditional infrastructure. Given that VDI has been discussed as one of the primary use cases around hyperconverged, these results were unexpected. It seems to indicate that hyperconverged infrastructure adopters are not realizing as much success with VDI as those that are building VDI environments on traditional hardware and software. Given the fact that many hyperconverged platforms started life as VDI solutions, this is an incredibly surprising discovery. However, there is an important caveat here. We do not believe that these results reflect on hyperconverged infrastructure, but are rather the result of other challenges, including the need to support graphics intensive applications to ensure end user satisfaction. VDI remains a complex use case with a lot of moving parts.
- Storage administrators have had considerable positive experience with traditional infrastructure (64% say that they are having no trouble on VDI) but those that are running VDI on hyperconverged infrastructure are experiencing capacity or performance challenges (27%).

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Many businesses need to be able to support and provide technology services to remote sites. These remote office and branch office (ROBO) needs can sometimes create challenges as centralized IT staff struggle to provide consistent support across all sites. A full 67% of respondents are supporting ROBO environments, as shown in Figure 6. The vast majority of those respondents – 44% – operate their ROBO environments using traditional equipment and services. Just 13% use a combination of traditional approaches and hyperconvergence and 6% use hyperconvergence as their sole ROBO platform. 4% of respondents approach their ROBO needs in some other way. However, in reviewing the responses for those in the "other" category, most of the described approaches would fall under the traditional equipment and services category.

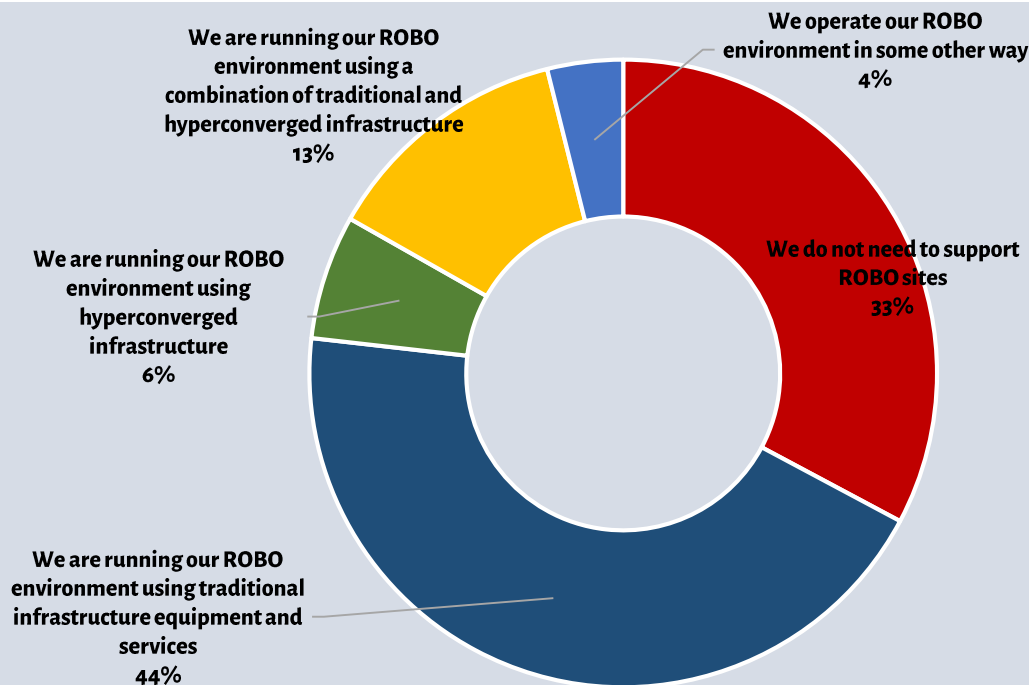## Which statement best describes your overall experience with your ROBO environment?

We are running our ROBO environment using a combination of traditional and hyperconverged infrastructure
13%

We operate our ROBO environment in some other way
4%

We do not need to support ROBO sites
33%

We are running our ROBO environment using hyperconverged infrastructure
6%

We are running our ROBO environment using traditional infrastructure equipment and services
44%

Figure 6: Remote office/branch office (ROBO) support needs

Remote Office/Branch Office Magnitude

Some ROBO environments are very small, encompassing just two sites (13%), while others are very large and consist of hundreds of sites (18%). Everything else falls in between. We suspect that ROBO complexity and difficulty levels off somewhere short of 100 or more sites. At some point, adding sites would seem to become a "cookie cutter" that wouldn't require continually starting from the beginning to figure out how to do it.
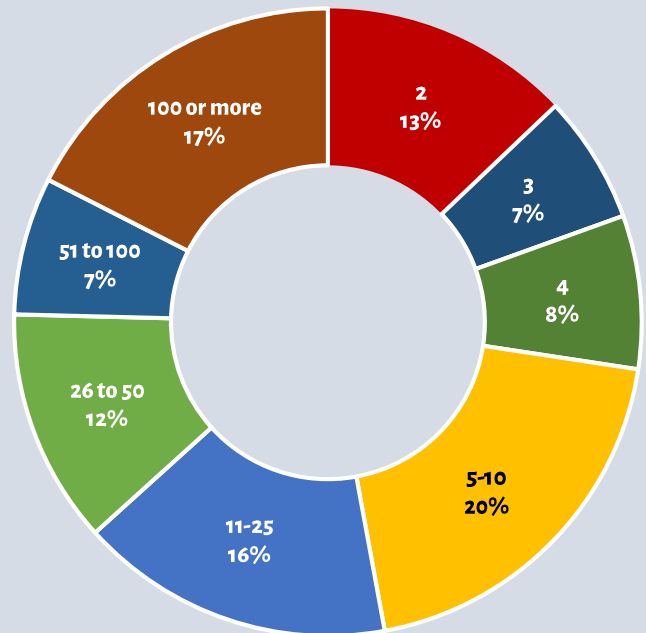
How many remote office sites do you support?

Figure 7: Number of remote sites supported by respondent organization

ROBO Challenges and Opportunities

ROBO is emerging as a key potential use case for hyperconverged infrastructure as organization seek to simplify their ROBO deployments. We asked respondents a series of questions around the characteristics of their ROBO deployments. We wanted to learn about the ways that companies are leveraging their ROBO environments as well as some of the challenges that they are facing in supporting their ROBO environments.

As you can see in Figure 8, a full 26% of respondents are experiencing trouble protecting data at remote and branch office sites. Given the criticality of data protection, we view this as a serious deficiency. Further, more than 23% of respondents indicate that they have some kind of performance challenge—CPU or storage—at ROBO sites. Rounding out the challenges, 21% of respondents say that their existing ROBO environment is difficult to manage and requires too much staff and, to make matters worse, they are experiencing storage capacity challenges at ROBO sites.
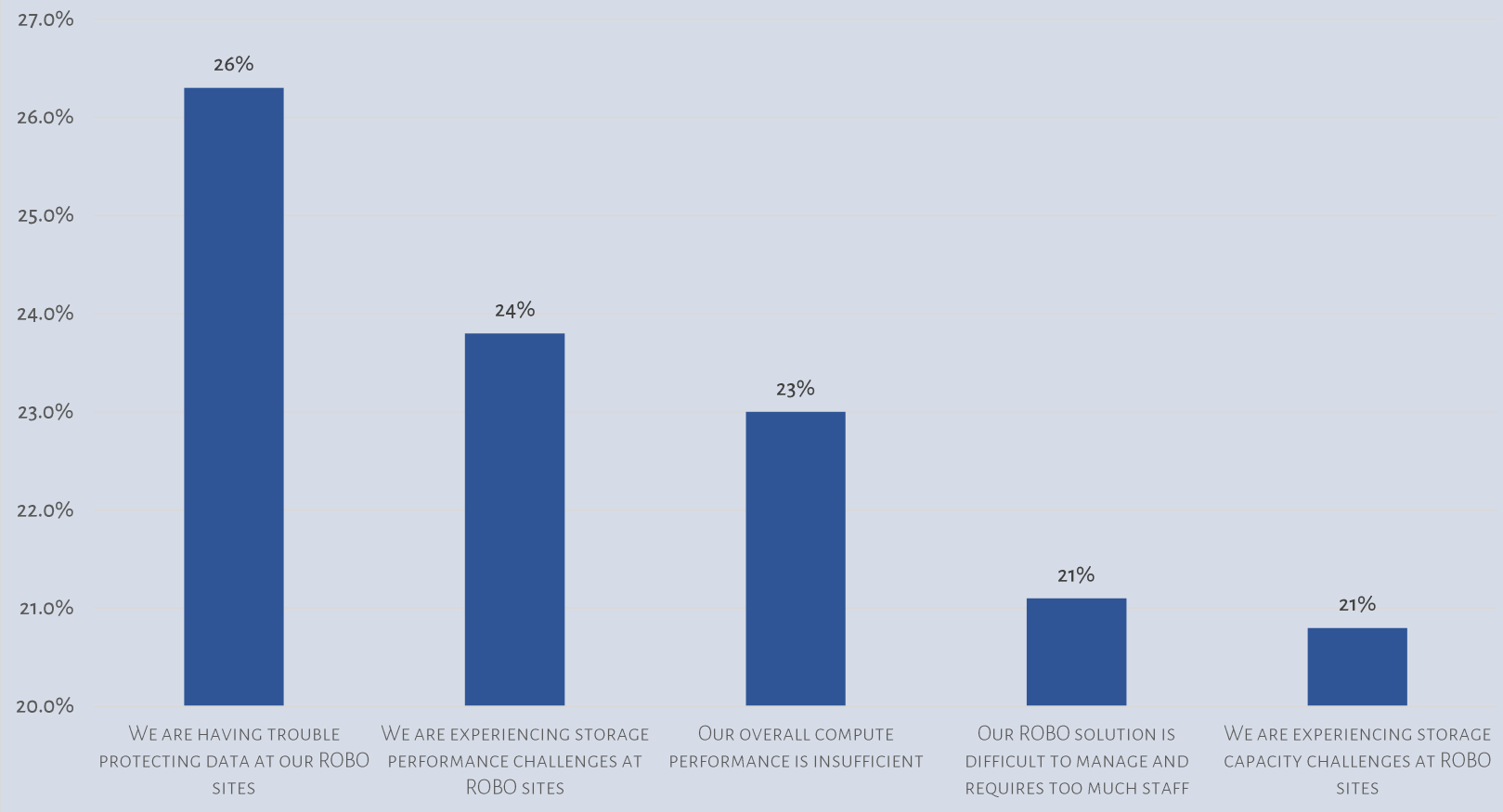
Current ROBO Challenges

Figure 8: Remote office/branch office (ROBO) challenges

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A number of respondents are finding useful ways to leverage their ROBO environments for uses beyond just providing services to remote sites. In Figure 9, you can see that there are many ways to use ROBO environments to achieve better application availability (19.5%) and to provide better disaster recovery services (17.3%).
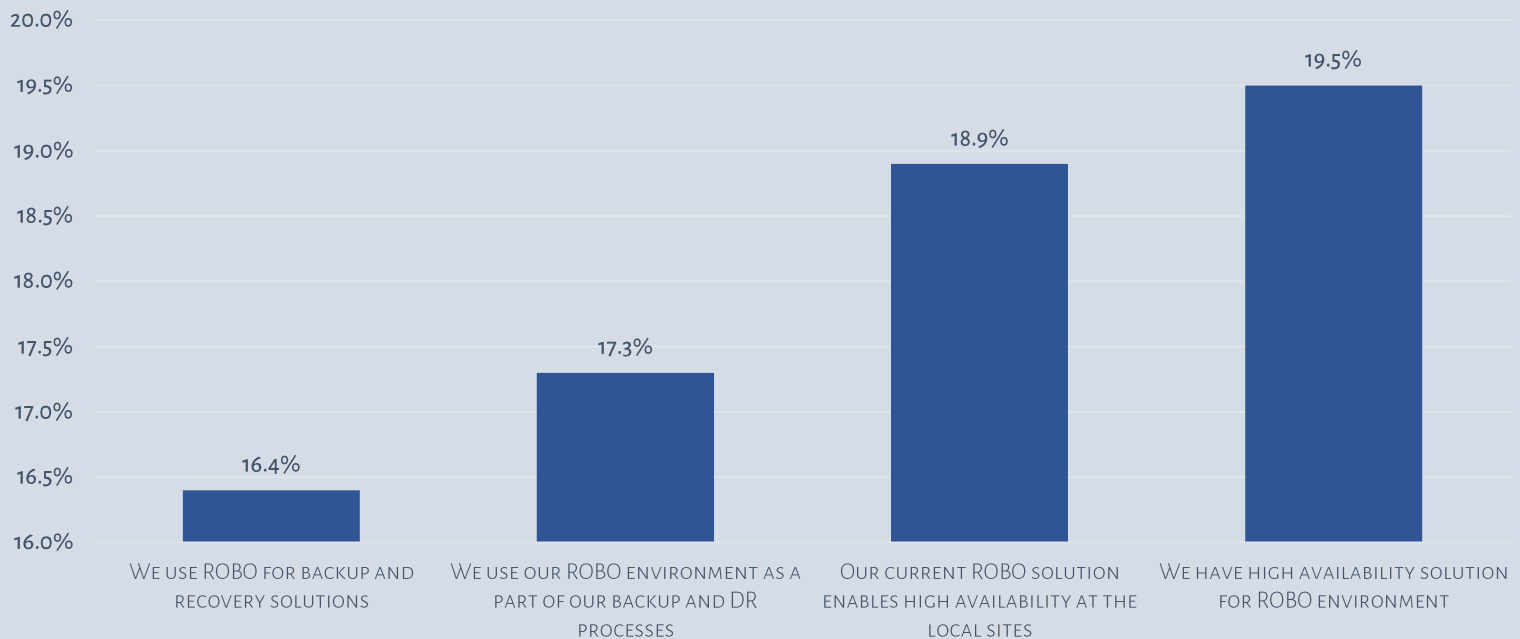
Leveraging ROBO Environment for Other Uses

Figure 9: Remote office/branch office (ROBO) opportunities

Key Findings

- Traditional ROBO deployment methods remain the choice for the vast majority of respondents (44%).
- 26% of respondents say that they are having trouble protecting data at ROBO sites. This is a critical problem and is serious. Data protection can make or break a business. We see opportunity for hyperconverged solutions that include data protection capabilities to fill this gap.
- More than 20% of respondents say that they are having problems at ROBO sites with compute and/or storage performance.

While public cloud isn't necessarily directly related to hyperconverged infrastructure, private cloud is very much related. There are increasing efforts in enterprises to change their service delivery models to mimic the public cloud. As you will learn in the following sections, there are some key differences between public and private cloud.

Hyperconverged infrastructure can be a key enabler for fast-tracking private cloud deployments. By simply "deploying infrastructure" in the form of hyperconvergence, data center administrators can focus their attention on building the automation and orchestration tools that are necessary to achieve their private cloud visions.

Private Cloud Adoption and Characteristics

The term "private cloud" is not always used consistently. While many attempt to shoehorn any private datacenter under this label, the reality is that those are just private datacenters. Typically, in order to be considered a "private cloud", there must be robust self-service capabilities for resource provisioning and management. Further, the environment must be able to easily scale as growth needs dictate. The key difference between a public cloud and a private cloud is who is able to use the services. In a public cloud, multitenancy—the ability to support multiple customers in a single environment—is the default. In general, customers share hardware with other customers. In a private cloud, the environment is built for just the company—no sharing required.

33% of those taking our survey indicated that they are not running a private cloud and they have no intention of doing so in the foreseeable future.
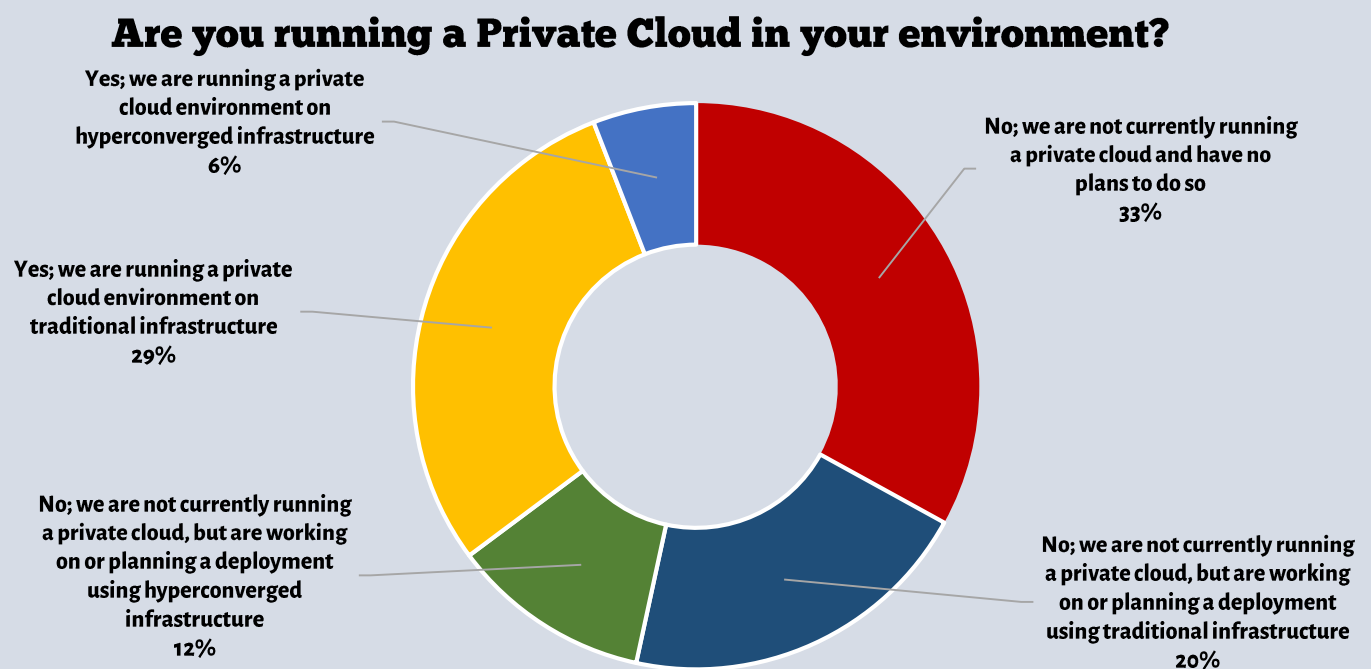
Are you running a Private Cloud in your environment?

Yes; we are running a private cloud environment on hyperconverged infrastructure
6%

No; we are not currently running a private cloud and have no plans to do so
33%

Yes; we are running a private cloud environment on traditional infrastructure
29%

No; we are not currently running a private cloud, but are working on or planning a deployment using hyperconverged infrastructure
12%

No; we are not currently running a private cloud, but are working on or planning a deployment using traditional infrastructure
20%

Figure 10: Private cloud deployment

Private Cloud Experiences

As is the case with ROBO, there are a number of different operational characteristics to consider with private cloud. For example, as mentioned before, the term "private cloud" technically means that self-service capabilities are inherent in the architecture. However, for 43% of respondents, that is not the case. In order for self-service to function, there needs to be a high degree of automation, but 48% of respondents say that they still have work to do in this area. In fact, the most basic level of automation – provisioning and orchestration – is cited by 38% of respondents as incomplete in their private clouds. Only 25% of respondents indicate that their private cloud environment is operating exactly like it should. In other words, there is tremendous opportunity for improvement in the realm of the private cloud.

Which of the following characteristics describe your private cloud experiences?

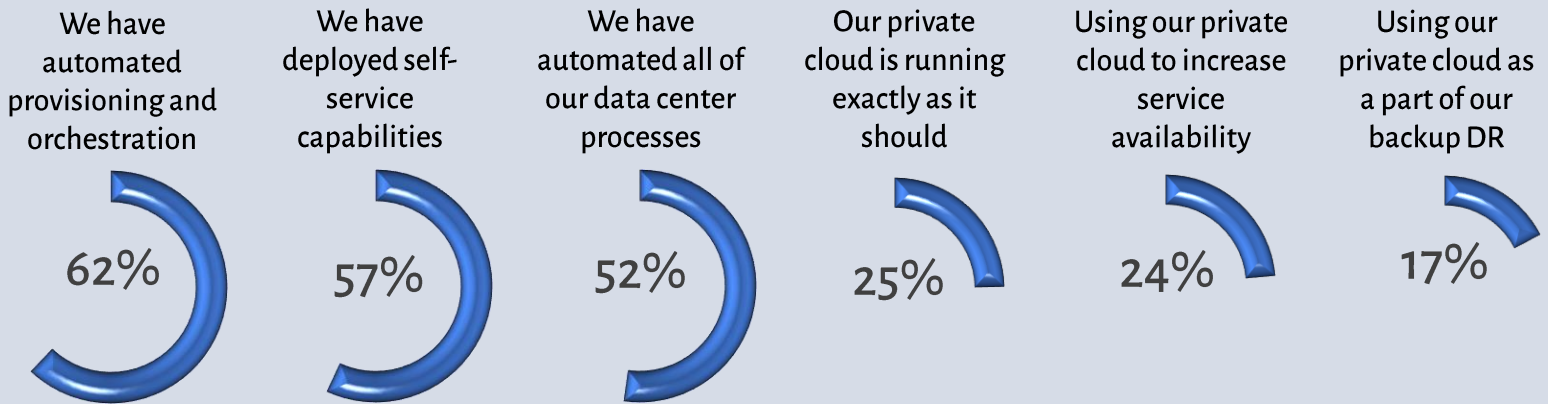| We have automated provisioning and orchestration	We have deployed self-service capabilities	We have automated all of our data center processes	Our private cloud is running exactly as it should	Using our private cloud to increase service availability	Using our private cloud as a part of our backup DR
62%	57%	52%	25%	24%	17%

Figure 11: Private cloud operational experiences

Let's look a little deeper into the one metric from Figure 11 that really matters: *Our private cloud is running exactly as it should*. In slicing the data by those running traditional infrastructure versus those running hyperconverged infrastructure, we find that those running hyperconverged infrastructure are far more satisfied than those running traditional infrastructure for their private cloud environments. 53% of respondents that are satisfied with their private cloud experience are running on hyperconverged. Only 37% of those running on traditional systems cite the same level of satisfaction.

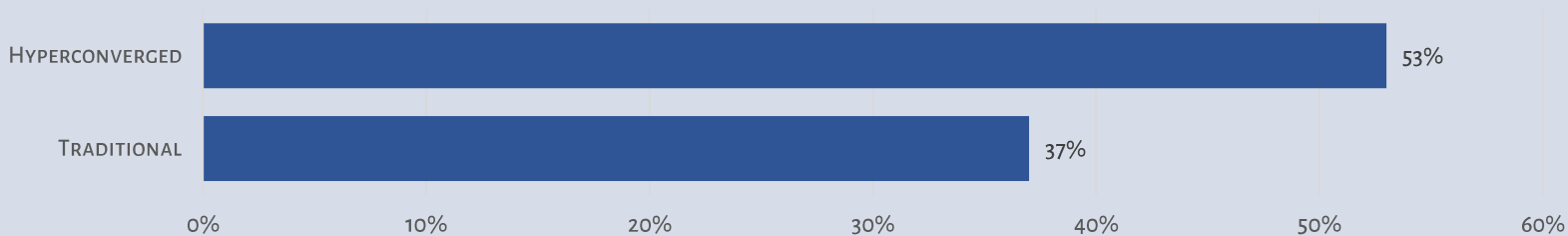## Our private cloud is running exactly as it should

Hyperconverged	53%
Traditional	37%

0% 10% 20% 30% 40% 50% 60%

Figure 12: Private cloud operational experiences

Public Cloud Adoption and Characteristics

Of course, "public cloud" is on many minds as a means to achieve business goals, most notably as a way to operationalize ongoing expenses and to help the business move toward a more consumption-based technology acquisition model. Although hyperconverged infrastructure can help organizations achieve similar goals, public cloud can be far easier to deploy than private cloud – at least initially – and doesn't have the high upfront costs that are inherent in "private cloud" or private datacenter architectures. A number of respondents are leveraging "public cloud" environments for a number of different purposes. By far, though, the most popular use case revolves around deploying test and development environments. 44% of respondents indicate that they have turned to the public cloud to aid in this area.

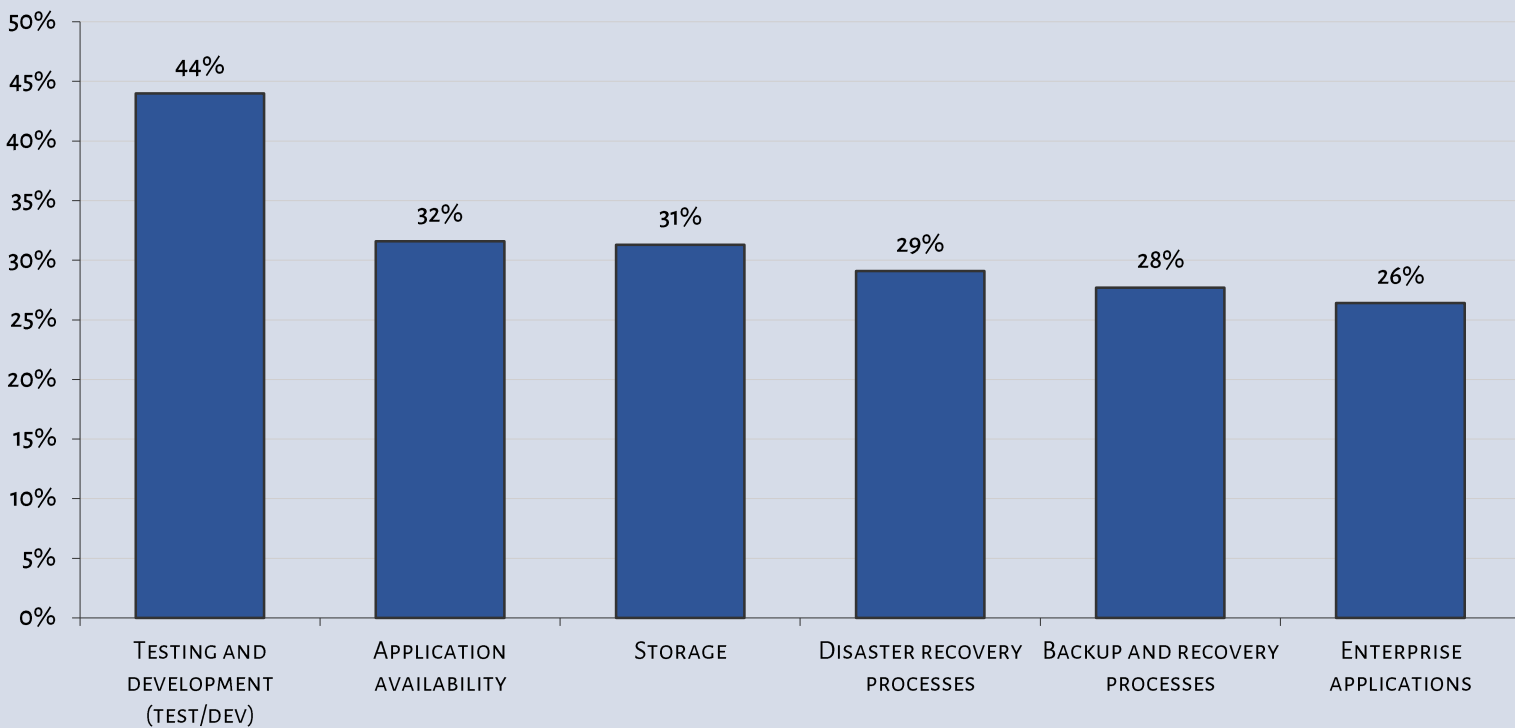## Are you using the Public Cloud for any of the following?

Figure 13: Public cloud adoption

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Larger companies are, by far, most likely to deploy cloud services. As you can see in Figure 16, companies comprised of 20,000 or more employees carry the highest percentage of deployment for every service for which we inquired.

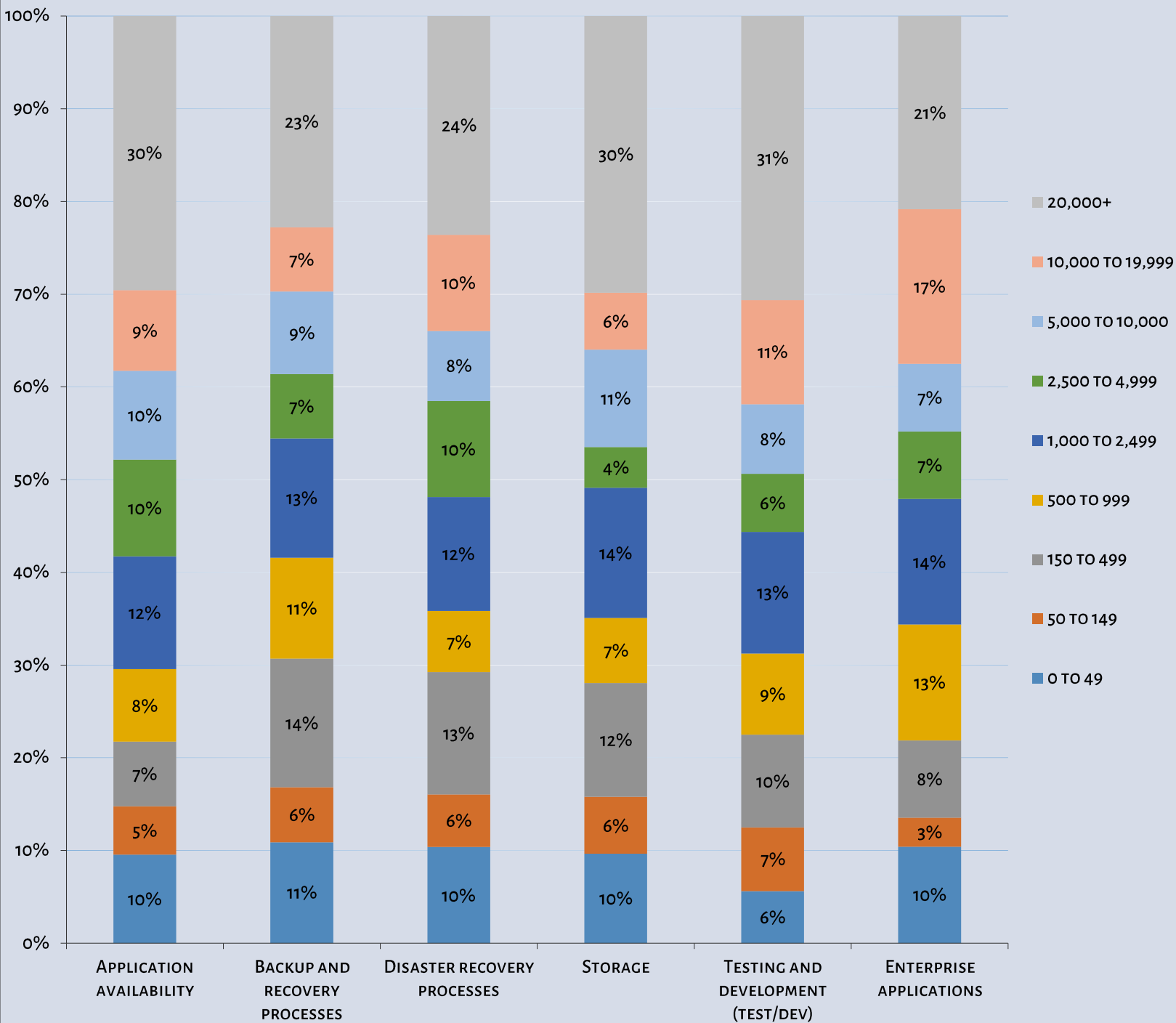# Are you using the Public Cloud for any of the following?

Figure 14: Public cloud adoption

For our survey, we had 543 respondents from across all company sizes. Figures 15 through 18 provide you with an overview for the characteristics for the set of respondents we had for this survey.
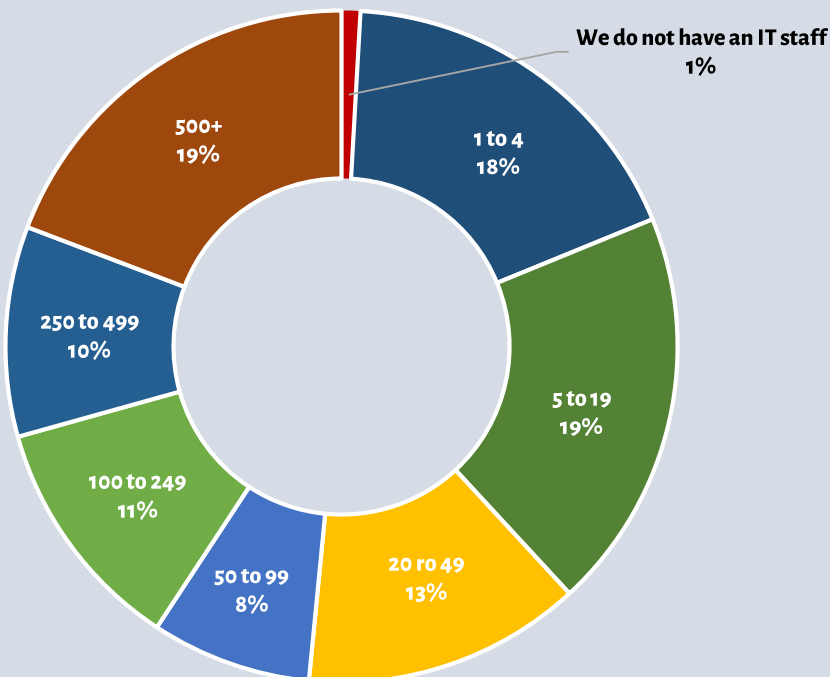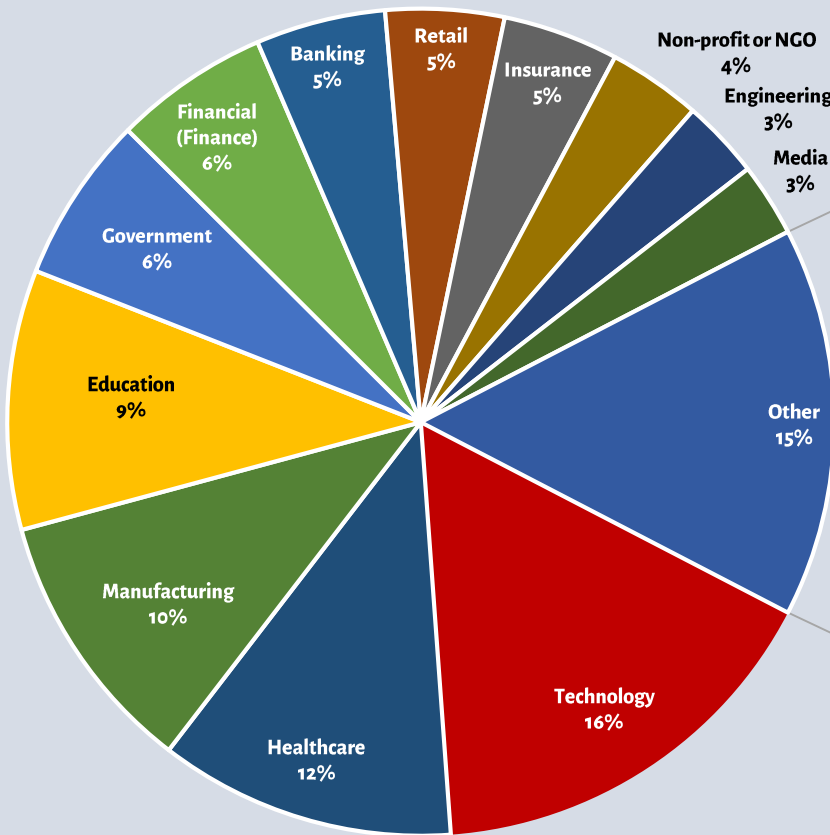
How many people work in your company?
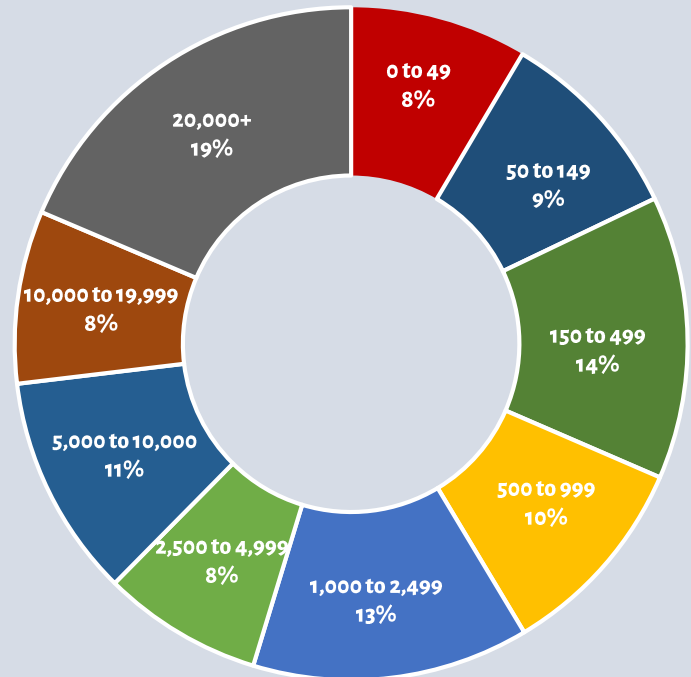
Figure 15: Number of people who work in the organization

How large is your IT staff?

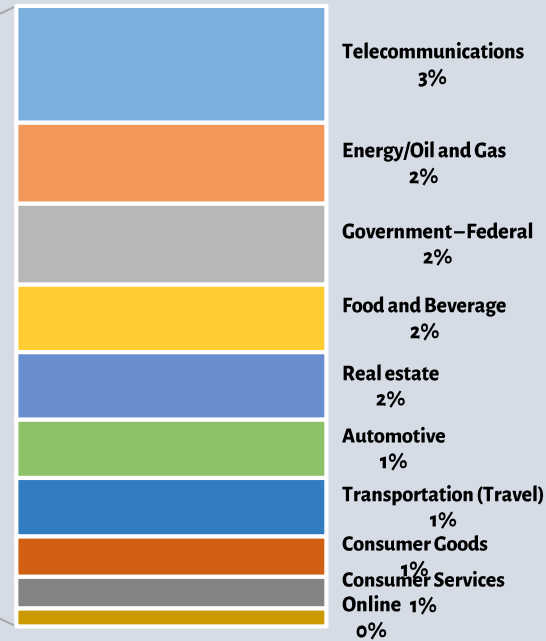Figure 16: Number of IT staff employed by the organization

Figure 17: The industry represented by survey respondents

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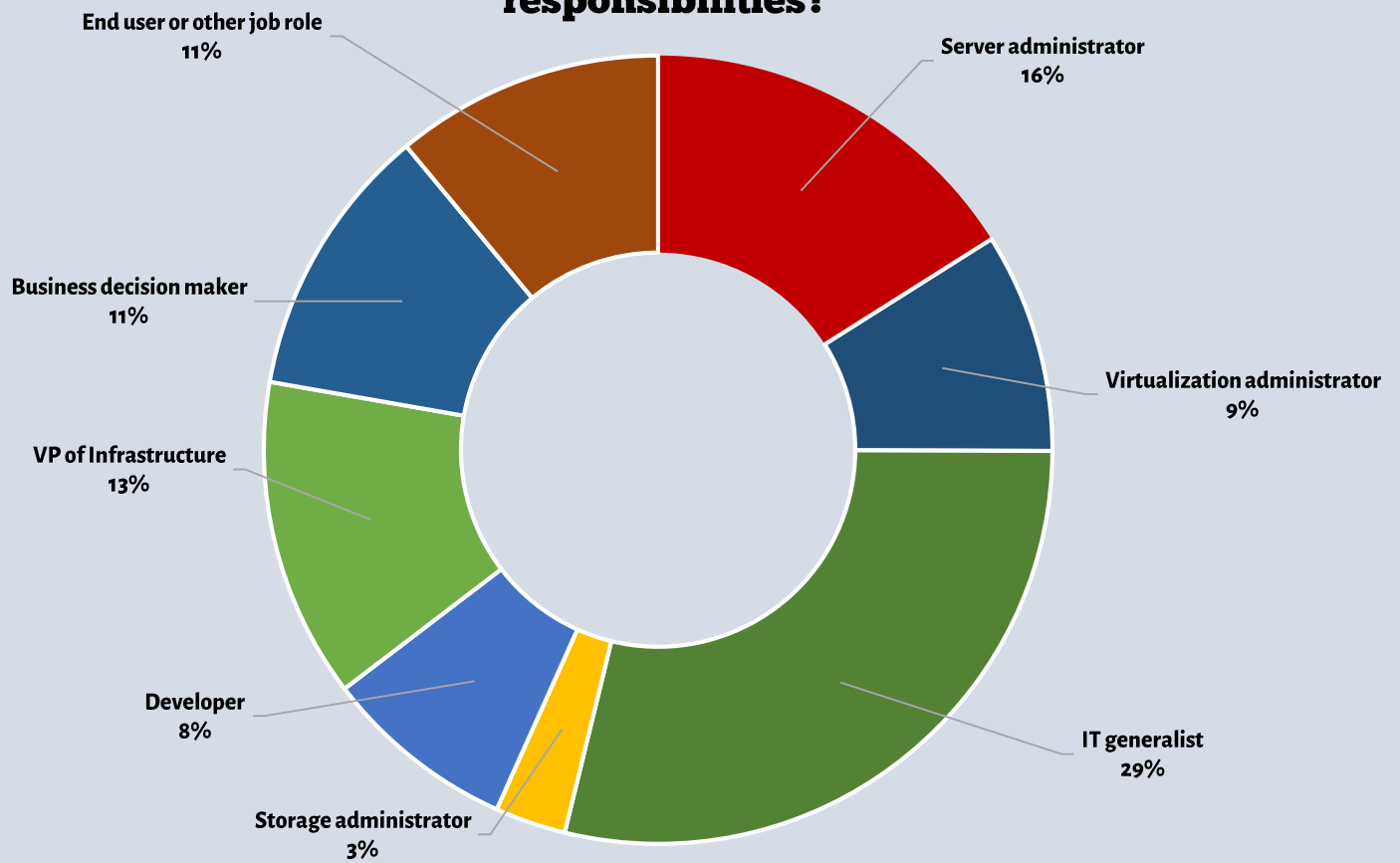## Which job most below most closely matches your job responsibilities?

Figure 18: Respondents' general job category

About

About HPE

HPE creates new possibilities for technology to have a meaningful impact on people, businesses, governments and society. With the broadest technology portfolio spanning, software, services, and IT infrastructure, HPE delivers solutions for customers' most complex challenges in every region of the world. More information about HPE (NYSE: HPE) is available at http://www.hpe.com/info/hyperconverged.

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