Enterprise Hybrid IT: The Role of Colocation, Cloud and Connectivity

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About this paper
A Black & White paper is a study based on primary research survey data which assesses the market dynamics of a key enterprise technology segment through the lens of the ‘on the ground’ experience and opinions of real practitioners – what they are doing, and why they are doing it.

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Introduction
Enterprises continue to move toward consuming IT services on demand, using a blend of cloud resources (public cloud, private cloud, or a mix of both) and non-cloud resources (on-premises or off-premises colocation and hosting services), effectively creating a hybrid IT environment. The performance of network connectivity between these resources, and between the applications and end users they serve, is vital in delivering IT-as-a-service because it affects reliability, security and overall service experience.

As applications and end users become increasingly distributed, and workloads are hosted at different points across an IT infrastructure – becoming more hybrid in nature – then the speed, quality of service, availability and security of network connections become ever more critical. Value-added colocation services, innovation in software-defined networking and the growing maturity of cloud computing can all help enterprises navigate around the challenges they face. Ultimately, organisations will need to align their workloads and applications with the ‘best execution venue’ for each one – whether that means the company data centre or in a public, private or hybrid cloud, or served out of a third-party colocation facility – in order to ensure that their IT workloads are available and performing optimally.

CONTEXT AND METHODOLOGY
Using a custom survey, we identify what multinational corporations (MNCs) consider to be top priorities in managing their IT workloads, explore the transformational changes they plan in the context of data centre use, and reveal their sentiments toward networking innovation.

This paper is based on a specialised survey conducted by 451 Research in August and September of 2016. We surveyed 240 senior IT decision-makers and influencers in selected markets around the globe – including the US, UK, Australia, China, Hong Kong and Singapore. Our survey base included MNCs ranging from 500 to 50,000+ employees, and encompassed organisations in the four major industrial verticals of financial services, manufacturing and industrial automation, tech/media/OTT, and professional services.
Executive Summary
Hybrid IT enablement is now well under way, with enterprises looking to extend IT operations and business services beyond the four walls of the workplace. Aside from turning to third-party colocation providers for additional capacity, geographical reach and value-added services, enterprises are increasingly willing to incorporate newer technologies like cloud computing into their overall transformation strategies. Although the extent of enterprise cloud adoption is currently uneven, more progressive organisations have already started migrating key business-critical workloads into the cloud. Hybrid IT and the notion of ‘best execution venues’ (BEVs) as a desired outcome are goals now planted firmly on the business horizon, and achieving these goals is enabled by the core networking components.

With changing enterprise requirements, corporate IT has essentially realised the need for a new operating model, and therefore is working to enhance the data centre infrastructure using a range of tactics (see Figure 1). Whether future data centre initiatives are operation-oriented or efficiency-driven, the enterprise network will play a bigger role in taking business transformation to a new level, with innovations around SDN/NFV (software-defined networking/network function virtualisation) in the data centre as underpinning technologies.

Figure 1: Top Data Centre Projects Planned in the Next 12 Months
Hybrid IT: The New Norm

IT innovations in the data centre, in network connectivity and in the cloud are beginning to coalesce into a hybrid IT architecture that can rapidly deliver IT as on-demand services that flex and respond to changing business needs. Such hybrid IT environments may use a mix of on-premises private cloud and external public cloud services, with orchestration between the platforms.

The transformation currently under way within many businesses is intended to radically improve the operational performance, scale and reach of the enterprise. It is being powered out of the data centre, and connectivity is taking centre stage. CIOs want to change the way they do things – they want to make the most of the flexibility, the speed of provisioning and the scale offered by cloud services. They want more choice and integration options for their non-cloud and dedicated infrastructures. And all the while, they want to have a say about the security and the location of their data to ensure business compliance.

One guiding principle developed by 451 Research to help IT decision-makers plot and navigate a course for their data centre transformation is the BEV, or ‘best execution venue.’ BEV is a concept that presents IT with an opportunity to improve efficiency and time to market with IT infrastructure. The term has its origins in the financial world, where it refers to the ability to place orders and execute stock trades in the current best possible environment to maximise return.

THE GUIDING PRINCIPLE OF BEV

For each workload, decisions must be made about the service level required. There are considerations around connectivity, network resiliency and application performance, issues of access control, server location and data security, and a comparison of the operating costs of running workloads on different platforms. All of these considerations can come into play when deciding if a specific workload is best hosted internally using on-premises infrastructure and enterprise management systems, or whether it should be hosted externally with a colocation or cloud service provider. And if the BEV should be some combination of these using a hybrid private/public cloud computing model, then just what is the right mix?

The focus on BEV addresses these considerations. Decisions about workload destinations (i.e., on-premises, off-premises colocated/hosted, or cloud payload) need to reflect specific usage criteria – such as security requirements, the level of interaction with other on-premises and/or cloud applications or databases, latency issues, data sovereignty rules and variability in user demand.

A BEV strategy enables an IT organisation to determine which compute venues are right for its various needs as part of the overall digital infrastructure. Successful BEV strategies will likely mean owning and operating fewer assets, while at the same time integrating additional hosted resources. The BEV for a business application may be entirely (or just subtly) different from that required for a batch computing application, a cloud-native app or a test and development workload. So while we see SaaS (cited by 27% of survey respondents) and public cloud (26%) as the preferred deployment models for customer-facing applications like CRM or a salesforce support suite, on-premises private cloud (33%) is considered best suited as an execution venue for database/data warehousing workloads.

Price, performance, flexibility, security, compliance, latency, data sovereignty and ease of use all come into play here. But the chief selection criteria for on-premises private cloud centre on control and management issues, data sensitivity, IP risk and security issues. For SaaS or public cloud, it is the perceived cost and business agility advantages they confer that drive selection.

A BEV strategy helps in deciding how to deploy workloads in ways that take advantage of the evolving service capability and price-performance characteristics of colocation, managed hosting or cloud services – weighed against more traditional on-premises infrastructure investments. With rising acceptance of cloud computing, hybrid IT is the result.
CLOUD AS A BEV DESTINATION

The need to provision applications/resources faster (cited by 46% of survey respondents), a requirement to reduce IT spending (56%), and meeting demand among end users for new features (58%) are the issues most likely to prompt businesses to consider off-premises alternatives as execution venues (hosted private cloud, IaaS, SaaS), and these are the major factors driving cloud adoption by MNCs.

The survey shows that currently 25% of MNCs are mainly using cloud resources for testing and development purposes, while 45% are using a mix of cloud resources and on-premises non-cloud servers for their production workloads. Some 17% of companies are planning to gradually phase out on-premises non-cloud servers in favour of more widespread cloud adoption. And 10% of surveyed organisations claim they have already gone ‘all in’ on cloud, with the entirety of their IT workloads and processes delivered via cloud services.

Going forward we expect businesses will begin to favour shifting IT off premises and will turn to an IT resources consumption model. This is illustrated in Figure 2, which shows a drop in workloads being processed by on-premises equipment in favour of off-premises or IaaS/public clouds. This helps reduce capex and the space required to house the hardware, and could allow redeployment of staff to other areas of the business.

Figure 2: Current Workload Execution Venues vs. Those in Two Years

<table>
<thead>
<tr>
<th>Today</th>
<th>In 2 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software-as-a-Service (SaaS)</td>
<td>11.1%</td>
</tr>
<tr>
<td>Infrastructure-as-a-Service (IaaS)/Public Cloud</td>
<td>13.6%</td>
</tr>
<tr>
<td>Hosted Private Cloud</td>
<td>14.0%</td>
</tr>
<tr>
<td>On-premises Private Cloud</td>
<td>18.2%</td>
</tr>
<tr>
<td>Off-premises, Non-Cloud</td>
<td>15.0%</td>
</tr>
<tr>
<td>On-premises, Non-Cloud</td>
<td>28.0%</td>
</tr>
</tbody>
</table>

In terms of geography, companies in Hong Kong are expected to be early cloud adopters in the global marketplace, with local companies planning to have more than two-thirds of their IT infrastructure services running in a cloud environment – on-premises private cloud, SaaS, hosted private clouds and public clouds. Strong support from local government agencies – in the form of financial incentives and government-led cloud initiatives – has a crucial role to play in accelerating cloud adoption. The Office of the Government Chief Information Officer has spearheaded a series of cloud initiatives and collaborative programs, including GovCloud, e-Government infrastructure services, the SMB Cloud Promotion Campaign, and the Hong Kong/Guangdong Expert Committee on Cloud Computing Services and Standards.

CLOUD PREFERENCE AND SERVICE PROVIDER MINDSHARE

There is a variety of service providers involved in the cloud computing supply chain. Leveraging their existing relationships with enterprises, service providers are racing to become the trusted cloud partner for their clients. Hyperscale cloud vendors have achieved a sizeable mindshare and market share among MNCs, regardless of geographical location. However, for the deployment of cloud infrastructure services in the individual surveyed markets, companies tend to also entrust ‘local’ telco carriers and systems integrators within their domestic business markets for service implementation. The appeal of the local IaaS provider reflects two key issues: a desire among organisations to put applications and data as close as possible to local users of those applications and data (and the advantage a local colocated data centre confers); and a need to control the location and security of data assets for industry compliance reasons.

Drilling into the country-level markets reveals a plethora of credible local service providers providing MNCs with multiple cloud services, sometimes alongside a global provider such as Amazon or Microsoft. If hybrid deployment is truly on the horizon, it is evident that the landscape is becoming distinctly cloudy, with some 48% of surveyed MNCs expecting a multi-cloud future.
COLO PROVIDER AS CLOUD ENABLER
As workloads are hosted at different points across an IT architecture that is getting stretched and more hybrid, the risk of being disconnected from other resources that they depend on becomes very real. Few business applications are self-contained. Where applications are deemed to be best hosted in an external service provider’s data centre, it becomes vital that connectivity between application and user is assured and managed end to end, and that the service is resilient and fully available. As more companies migrate to a hybrid architecture, mixing on-premises data centres with colocation and private or even public cloud resources, a common aim will be to place applications closer to an ever more mobile customer and employee base. In this context, locating in facilities that have peering points with mobile carriers can greatly improve application performance.

Cloud technologies have radically altered the way infrastructure is operated, provisioned and orchestrated, and have dramatically impacted the service requirements needed from an infrastructure service provider. Where applications become distributed, fast and secure connections are even more critical. One of the most reliable routes into public cloud is via well-connected colocation facilities backed by guaranteed service-level agreements (SLAs) to ensure quality of service. Indeed, the ability to provide secure direct connections to third-party cloud services within a colocation provider’s facility is a top selection criteria for MNCs in choosing colo providers (86% of survey respondents rated this ‘8’ or higher on a scale of 0-10, with 10 being ‘extremely important’). This type of connectivity is also the top value-added service that a colocation provider can offer an MNC (95% rated this ‘4’ or higher on a scale of 0-5, with 5 being ‘extremely interested’).

Providing direct connectivity to these services for customers already colocated in a data centre is an area of significant market differentiation. Another area of growing interest is secure private connections between cloud providers and customers outside the colo facility. The value of an interconnection ‘ecosystem’ is growing, and the appeal is already significant for organisations in particular sectors where groups of companies need to share large data sets (e.g., oil and gas, movie production, pharmaceuticals and genomics) or need to trade information (e.g., financial services trading ecosystems). As more firms start to compute and share large data sets, demand for these communal meeting points (within colocation data centres) will only continue to grow.

Transforming Enterprises Gives Colocation a New Lease on Life
In the past few decades, owning and managing data centre operations, while not always optimal, did provide corporate IT with a sense of predictability and control. Not only did operations staff know how and where IT systems were deployed and allocated, they knew how users would interact with those systems and how those systems would perform. Today, with the increasing availability of emerging technologies and the adoption of new business models, the predictability of resource needs and application usage can be less clear, as the task of data centre planning and data centre management grows in complexity.

The widespread mobility of employees and customers and the global reach of businesses have only exacerbated the situation: enterprises constantly seek new ways to connect co-workers and partners and to interact with customers, wherever they are. The reach and flexibility of the IT infrastructure and the speed with which services can be brought online now makes for competitive differentiation.

REASONS FOR COLOCATION
The majority of the world’s data centres are still owned and run by enterprises and large organisations (451 Research estimates that about 75% of total global facilities are enterprise DCs), but many of these same organisations are drawing on colocation services from third-party data centre providers in their quest to better position their businesses. To some companies, consolidating a growing number of business operations, as a means of tackling business processes in danger of becoming more complicated and less cohesive, makes perfect sense. Others are increasingly coming around to the view that colocation, rather than hosted cloud, is the better option to address data security and compliance issues, as they weigh the difficulty of addressing the complex requirements of a growing global workforce.

As illustrated in Figure 3, there are many reasons for enterprises to consider using colocation facilities to supplement or substitute for their own data centres. Because colocation facilities are built with superior technical specifications for power, cooling, generators and security systems, they provide extremely high operational standards. They are also built with redundancy in mind so that the provision of power and cooling is always assured, as is the availability of bandwidth and network.
When considering the use of IT infrastructure sourced outside the enterprise walls, of course security remains a paramount concern. This is largely not a matter of technical security: almost to a fault, infrastructure service providers have better core security practices and operations than most enterprises do (the automated security practices of a service provider’s threat detection, and the response and mitigation systems that run on and around its infrastructure, are well out of reach for even the most sophisticated enterprise environments).

In the context of colocation, our survey shows that decisions are being shaped principally by considerations about what data can and cannot be stored in certain locations – due to compliance regulations like the USA Patriot Act, the EU Data Protection Regulation, the healthcare industry’s HIPAA obligations, and PCI DSS in financial services and retail, as well as many other country-specific regulations. Thus, data location has become one of the primary drivers among MNCs opting for colocation (As Figure 3 shows, this is the case for 72% of the MNCs polled).

**Figure 3: Demand Drivers of Colocation**

<table>
<thead>
<tr>
<th>Demand Driver</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires Regional/Local Presence Due to Data Sovereignty Compliance</td>
<td>72.1%</td>
</tr>
<tr>
<td>Requires Regional/Local Presence Due to Latency</td>
<td>65.0%</td>
</tr>
<tr>
<td>Gain a Secure Direct Connection to Cloud Service Providers</td>
<td>55.8%</td>
</tr>
<tr>
<td>Peering/Interconnection with Service Providers, Partners, Customers, etc.</td>
<td>46.3%</td>
</tr>
<tr>
<td>Organisation No Longer Wants to Own Datacentres</td>
<td>41.3%</td>
</tr>
<tr>
<td>Business Continuity Plans and Disaster Recovery</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Further analysis reveals differences between vertical segments. Some 78% of manufacturers stated that getting help with data sovereignty/compliance issues was the prime motivator for using colocation services. On the other hand, approximately 65% of financial services firms wanted secure direct connection to cloud providers via their colocation providers, which exceeded the corporate average of 56%. Consequently, colocation services represent an integral part of enterprise data centre transformation strategies as CIOs look to shake free of older ‘on-premises only’ operational models and refine their data centre strategies for the delivery of a predictable user experience.

**SPENDING TRENDS**

In addition to the time and financial commitments required to streamline data centre operations, the success of a company’s colocation strategy will hinge on its willingness to work with the colocation provider for value creation. This will require support at all levels within the organisation (not just the IT department) and firm financial commitment from senior management. According to our survey results, while 37% of companies plan to keep their budgets for colocation services at the same level, close to 50% are set to increase their spending in the next 12 months, with varying degrees of financial commitment (see Figure 4). This reflects a growing trend among enterprises opting to outsource physical data centre environments rather than invest in building new data centres.
COLOCATION IMPERATIVES

Traditional models of leasing space and racks have given way to new approaches that focus on scalability and manageability. To address ever-changing user requirements, IT executives are tasked with scouring the landscape for innovative ways to enhance business agility and resiliency. The new demands for colocation services are changing the relationship between enterprises and their colocation providers. Freeing organisations from data centre ownership is no longer the main consideration for choosing a colocation provider – there are far more selection criteria in play, as Figure 5 illustrates.

Given that having direct links to cloud providers is one of the reasons more than half of the surveyed companies use colocation services, it came as no surprise that the ability to secure direct connections ranked highest in the service provider selection criteria (cited by 86% of respondents), followed by reliability and redundancy of the facility (84%) and security (83%). Having a level of control and visibility into rack-level statistics through remote management and monitoring tools was deemed important to the selection process for nearly 80% of surveyed companies. While companywide cloud
deployment is far from mature, roughly three-quarters of companies opted for colocation providers that would make a variety of cloud services (IaaS, PaaS or SaaS) readily available.

From an operational standpoint, CIOs need more than just a quality physical facility when it comes to augmenting IT operations outside the walls of their own data centres. The practicability of service orchestration comes to the fore, and as far as a colocation-specific value proposition is concerned, it comes in many guises. The ease of service integration, accessibility to cloud providers and real-time billing are the core components of this equation (see Figure 6).

**Figure 6: Preferred Value-Added Services Offered by Data Centre Service Providers**

- Access to real-time billing information: 95.0%
- Workload migration / lift-shift integration services: 95.0%
- Managed Security: 94.6%
- End to end application management including monitoring: 93.8%
- On-Site, Hands-on or “White Glove” Support: 92.5%
- Flexibility in the way network resources are provisioned: 92.1%
- Backup, replication, DR-delivered as a service: 92.1%
- Dynamic allocation of bandwidth between sites: 87.5%
- Onboarding and integrated CDN Capabilities: 81.3%
- Access to SDN/NFV type services: 76.3%
- Self-provisioning of services via portal/APIs: 76.3%
- Access to application development tools & platforms: 72.9%

In terms of geography, individual surveyed markets do manifest a degree of variation in terms of the top three preferred value-added services. Approximately 73% of Singapore-based enterprises selected backup and DR-as-a-service among the top three, while 85% of Australian companies are interested in using managed security services from a colocation provider, which exceeded the global average of 75%.

Aside from disparities between countries in terms of economic development and infrastructure readiness, the different dynamics of individual markets could present new business opportunities. For those who are willing to pay a premium for value-added services, a key takeaway is that the cost-savings component is not necessarily the dominant driver for colocation services. Whichever value-added services CIOs choose from their colocation providers, they will go a long way in helping them mitigate risks while moving down the hybrid IT path.
THE EXPANDING ROLE OF THE ENTERPRISE NETWORK IN THE HYBRID IT WORLD
CIOs are very aware of the impact that emerging technologies like cloud computing, big data, mobility and IoT have had on their network infrastructure, not to mention the new demands derived from the hybrid IT world. One consequence of having to cater to these demands is that two-thirds of MNCs surveyed expect a need for more bandwidth in 2017, while 17% of respondents expect that need to double (see Figure 7). In our view, it’s essential for businesses to partner with service providers that are developing new capabilities and tools that will enable them to harmonise platform control and orchestration across the hybrid IT environment.

Figure 7: Expectations of Changing Bandwidth Requirements Into 2017

![Chart showing bandwidth requirements expectations]

Investing strategically in technologies and services that can improve operational efficiency in the data centre, without compromising productivity and performance, has become the new mandate for CIOs. Indeed, many have done a great job of re-engineering their IT infrastructure, incorporating cloud computing and automation technologies into their overall IT strategies. But simply because IT developers now have quick and easy access to additional compute resources does not mean they automatically gain improved productivity in a hybrid IT world. In most cases, IT developers or application owners still need to manually configure network components to ensure service availability, security and interoperability.

Figure 8: Prevailing Data Centre and Networking Concerns Among IT Executives

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning lead time for connectivity and purchasing network hardware</td>
<td>65.4%</td>
</tr>
<tr>
<td>Unable to connect to my organisation's connectivity provider</td>
<td>52.9%</td>
</tr>
<tr>
<td>Fixed and costly contracts</td>
<td>50.4%</td>
</tr>
<tr>
<td>Failure to meet Service Level Agreements</td>
<td>46.3%</td>
</tr>
<tr>
<td>Unable to scale bandwidth when required</td>
<td>45.4%</td>
</tr>
<tr>
<td>High network latency</td>
<td>39.2%</td>
</tr>
</tbody>
</table>

As evidenced by our survey data (see Figure 8), the inability to provision networks quickly enough remains an issue. Likewise with the ability to connect without problems and to scale when required, which are also seen as priorities for organisations needing to improve the operational efficiency of their data centres. Almost two-thirds of surveyed enterprises consider provisioning lead-time for connectivity and hardware to be the biggest issue surrounding data centre networking. And more than half of surveyed companies worry about network availability, especially with their primary connectivity providers. Approximately 50% of enterprises fret over fixed and costly contracts.
These prevailing sentiments illustrate how important it is for businesses to make the right choices if they are to maintain the availability and resiliency of workloads running in hybrid IT environments. The mandate for being performance-driven does not stop with the enterprise computing architecture; the enterprise network must also be optimal by design.

The survey also exposed differences in perception about networking issues from a geographic perspective. Provisioning lead-time for network deployment is the most pressing issue among Chinese companies, while SLA guarantees appear to matter more to Australian companies.

**THE QUEST FOR TECHNOLOGY INNOVATION: SDN**

Growing numbers of service providers, to their credit, have already invested in orchestration tools to simplify the management of virtualised and hybrid IT environments. Organisations are looking for ways to ensure the scalability, flexibility, visibility and control of their hybrid IT infrastructures, across both physical and virtual networks. This is where innovation in the area of software-defined networking (SDN) comes into play.

In general, the surveyed companies appear to have a moderate understanding of various aspects of the SDN value proposition, including scalability, speed, productivity and cost-efficiency. As reflected in our survey results (see Figure 9), the driving forces for SDN adoption are those elements that can have the greatest impact in making the business more nimble – dynamic control of the network and interconnections that feed critical data to applications. Control of both the connectivity and capacity of the network allows users of this more capable infrastructure to properly manage their hybrid IT operations. This is especially true for IT managers that have been frustrated by long provisioning times for new services and capacity management – both physically and virtually.

A pragmatic first step may be to partner with a service provider that has gained early-adopter SDN expertise, and can therefore enable a controlled transition to the more flexible capacity management that SDN can provide. These first tentative moves would allow the benefits of SDN and software-defined infrastructure services to be applied to the management of the hybrid IT infrastructure.

**Figure 9: Perceived Benefits of SDN-Enabled Infrastructure**

Q: Which of the following factors have or would motivate your company to use the software-define infrastructure of your service provider?

- Enable faster service provisioning at scale: 76.3%
- Better control and visibility than premise-based alternatives: 75.8%
- Lower maintenance and support costs than premise-based alternatives: 71.7%
- Lower capex (hardware and software) than premise-based alternatives: 69.2%
- Improvement in security: 70.0%
- Able to deploy and manage connectivity in new markets quickly and control costs: 67.9%
- Easier/quicker/cheaper upgrades, updates, and security patches: 62.1%
- Availability of superior SDN/NFV skills: 45.0%

One of the seeming paradoxes in the survey responses is that there is definite concern about overall system security (see Figure 10), yet also an expectation that a more adroit system could enhance security. Concern about system security is something we see in all early-stage technology studies, even in cases where a new environment can provide marked security improvements – it’s essentially down to the basic fear of the unknown. Some service providers are starting to address this concern with security-focused service control and management. This can be augmented by leveraging network security concepts like micro-segmentation and other network innovations that will bolster the information security arsenal and help mitigate some of the speed bumps on the journey to hybrid IT.
### Figure 10: Perceived Barriers in Moving to a Service Provider’s SDN-Enabled Infrastructure

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns regarding security</td>
<td>72.5%</td>
</tr>
<tr>
<td>Issues around compliance and industry regulation</td>
<td>43.3%</td>
</tr>
<tr>
<td>Vendor lock-in</td>
<td>40.8%</td>
</tr>
<tr>
<td>Current technology is sufficient</td>
<td>38.3%</td>
</tr>
<tr>
<td>Difficulty in integrating SDN/NFV-enabled network features/functions with existing networks</td>
<td>38.2%</td>
</tr>
<tr>
<td>No significant cost savings achieved</td>
<td>35.0%</td>
</tr>
<tr>
<td>Concerns about multi-tenancy aspect of network deployment</td>
<td>27.1%</td>
</tr>
<tr>
<td>New technology is a concern as it isn’t tested and proven to be stable</td>
<td>25.8%</td>
</tr>
</tbody>
</table>

### The Future of Enterprise Hybrid IT Transformation

Growing numbers of IT executives realise the importance of creating a user-driven IT model that encourages collaboration and inspires innovation to achieve greater productivity and performance. One dimension of this has been the introduction of a hybrid IT model and software-centric service delivery into the work environment. With cloud being the major change agent, business transformation will give rise to enterprises that are more reliant on and better able to leverage their digital infrastructure. To that end, we expect the following:

- Demand for colocation will persist, as either a complement to or substitute for an organisation’s own data centre infrastructure.
- Bandwidth requirements will continue to increase, emphasising the central role of the network.
- Application-aware cloud platforms will become critical, allowing applications to be easily provisioned, moved and managed across one or more platforms, whether on-premises infrastructure or a cloud environment.
- The necessary focus on user-centric service experience will catalyse continued data centre transformation and IT-as-a-service as a desired outcome.

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Telstra is a leading telecommunications and technology company offering a wide range of services globally. We offer global connectivity and innovative IT capabilities to organisations that need to connect to new markets throughout the world, particularly in the Asia-Pacific region.

Telstra’s heritage is proudly Australian, but we have a long-standing international business with a focus on the Asia-Pacific region. Today, we have over 3,500 employees based in 20 countries outside of Australia providing services to thousands of business and government customers.
Appendix: Demographics

Figure 11: Demographic Breakdown of Study Participants

**GEOGRAPHY**
- Hong Kong: 16%
- Singapore: 16%
- China: 17%
- Australia: 17%
- United Kingdom: 17%
- United States: 17%

**REVENUE**
- M-249.9M: 19%
- 250M-499.9M: 11%
- 500M-999.9M: 18%
- 1B-4.9B: 24%
- 5B-9.9B: 10%
- >$10B: 18%

**COMPANY SIZE**
- 500-999 Employees: 12%
- 1,000-2,999 Employees: 22%
- 3,000-4,999 Employees: 13%
- 5,000-9,999 Employees: 15%
- 10,000-24,999 Employees: 13%
- 25,000-49,999 Employees: 8%
- 50,000 or more Employees: 12%

**VERTICAL SECTOR**
- Manufacturing & Industrial Automation: 25%
- Financial Services: 25%
- Professional Services: 25%
- Tech / Media / OTT: 25%