

COMPLIMENTARY REPORT FOR DELEGATES

Building the Infrastructure to Enable the Digital Enterprise



Digital Infrastructure Summit

MAY 19-21, 2015
SANTA CLARA
CONVENTION CENTER





Welcome to 451 Research Digital Infrastructure Summit 2015

Thank you so much for joining us at the inaugural 451 Research Digital Infrastructure Summit in Santa Clara, California. This event brings together IT leaders like you to discuss the critical technology changes that will define your business for years to come.

You are on the most challenging IT transformation journey to date – becoming a digital business. The drivers for change are business-led – to create sustainable competitive advantage, to get to market faster, to convert opportunity into profit more effectively, and to build lasting, engaged relationships with customers. Technology is the enabler of these goals, not just a tool to support them. At the heart of the transformation – and the theme of the Digital Infrastructure Summit – is building the digital infrastructure backbone to support new workloads and applications whether they are deployed in your own datacenter, off-premise in a colocation facility, in the cloud or all of the above.

We know you are looking for a competitive edge. How can you emulate the operational efficiency and agility of Amazon and the service providers in your environment? What services must you create for the business to compete effectively against external providers? What architectural foundations do you need to put in place today to be ready to act when business leaders come calling?

These are just some of the questions that we will tackle at the Digital Infrastructure Summit. Think of this report as your pre-event appetizer. It will introduce you to the ideas and research that our analysts have been developing and also help you understand how we see these diverse themes fitting together. We've also provided PDF versions of all the research mentioned in this report.

Everyone at 451 Research looks forward to seeing you at Digital Infrastructure Summit. If you have any questions or concerns, please do not hesitate to reach out to me directly.

Sincerely,

Simon Yates

VP, Enterprise Strategy, 451 Research

Co-chair: Digital Infrastructure Summit
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Building the Infrastructure to Enable the Digital Enterprise

THE 451 TAKE

In today's always-on, always-connected and ever changing environment, every business depends on its digital infrastructure backbone. New and legacy applications and workloads must be adapted to live in this new world. On the one hand, you need to build the on-premises foundations by modernizing existing datacenter and IT infrastructure for a more converged, software-defined and cloud-ready environment. You must also evaluate the public and hosted cloud options to lower costs, improve efficiency, be more agile and have the freedom to move quickly when opportunities arise. If you don't have an IT strategy for the digital infrastructure transformation in place already, you need one. You will need to understand how to build and operate a private cloud, determine which deployment environment best suits a particular workload, what management tools to use and which cloud providers and partners are best equipped to help. Many of the technology suppliers are small and many of the standards are still in development. This is not a land for the faint of heart.

EVERY BUSINESS DEPENDS ON ITS DIGITAL INFRASTRUCTURE BACKBONE

Jonathon Reichental, CIO of the City of Palo Alto, isn't just responsible for managing IT systems anymore but for engaging the Palo Alto community to improve daily life for the city's residents. One example of what it means to be a digital business in city government is the PaloAlto311 initiative. It's an app that allows anyone with a smartphone to take photos and report incidents of dumping, potholes, broken traffic lights, and graffiti, send it to City Hall and track its resolution in real time. Each request includes embedded mapping data and ends up on the screen of the employee assigned to the problem as soon as it's filed. It also instantly goes up on the city's Open Data platform, visible to all.

You can't do initiatives like Palo Alto311 without a strong digital infrastructure backbone. What do we mean by Digital Infrastructure? We think of it as analogous to physical infrastructure – the network of roads and railway lines, facilities that maintain operations, and the control points that manage and optimize flow. In the same vein, Digital Infrastructure relies on datacenters, IT hardware and software stacks, and external third-party cloud and service providers to control and optimize the flow of information between businesses and their customers and partners.

The Digital Infrastructure Summit builds on the research of analysts like John Abbott, Rhonda Ascierio, Peter Christy, Dan Harrington, and Simon Robinson who focus on datacenter technology, servers, storage and networks.

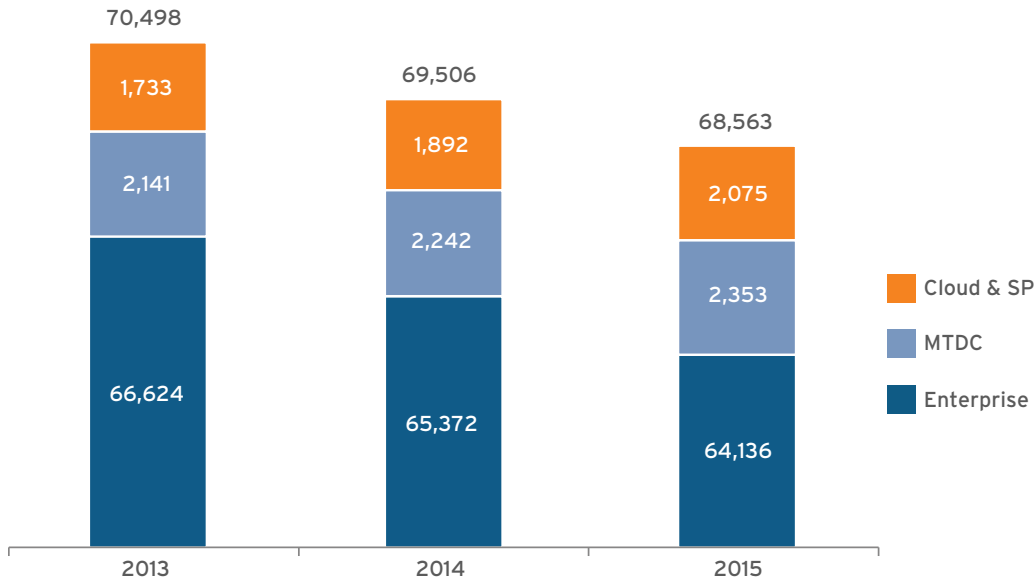
DATACENTER CONSOLIDATION CONTINUES WITH FEWER BUT BIGGER FACILITIES.

Datacenter consolidation and better IT asset utilization remain a top priority - even after almost a decade of labor and investment in the effort to be more operationally and financially efficient. With Intel offering 18 multi-threaded cores per processor and VM density averages reaching double digits per server, you can imagine how an organization could run their entire operation on a small number of servers. The result? 451 Research Voice of the Enterprise Datacenter research shows that premium datacenter openings offset closings, but for regional and local datacenters, server rooms, and server closets, the trend is clearly toward closure. This represents a gradual shift away from owning many distributed sites to owning large centralized ones, owning none at all, or moving to co-location facilities or the cloud.

North America Datacenter Count by Owner Type

EXCLUDES SERVER ROOMS AND CLOSETS

Source: 451 Research, Datacenter Market Sizing Model, Q4 2014



THE NOTION OF THE SOFTWARE-DEFINED DATACENTER (SDDC) IS ON THE RISE.

SDDC is a vision for IT infrastructure that extends virtualization concepts such as abstraction, pooling, and automation to all of the data center’s resources. All elements of the infrastructure — networking, storage, CPU and security — are virtualized and delivered as a service. For enterprise datacenter operators, the rise of SDDC is a major shift. When asked what technologies will have the greatest impact on datacenter operations over the next two years, 42% cited software-defined datacenter (SDDC) as having the greatest impact.

ENTERPRISE INTEREST IN DCIM AND DCSO IS GROWING.

IT infrastructure and operations teams generally don’t give a lot of thought to datacenter infrastructure management (DCIM) software. Most datacenters today are not running DCIM and, because it’s more of a facilities tool, it’s not top of mind either. IT’s job is to run the production engine that supports the application and service needs of the business. But the next evolution of DCIM — dubbed datacenter service optimization (DCSO) — is following the same evolutionary path as IT systems management. DCIM is moving beyond data collection and analysis to become more service-oriented and better able to bridge physical and virtual environments. Increasingly, DCIM is becoming integrated with IT service management (ITSM) software and initiatives. For IT teams, it’s time to give DCIM and DCSO a good, hard look to determine whether it can help make operations more efficient, and to scrutinize the vendors for the right solution for your specific enterprise.

CONVERGED AND INTEGRATED SYSTEMS DOMINATE THE SYSTEMS DEBATE.

The world of information technology has many forces playing across its surface, but one of the most hotly debated is that of convergence. The improved efficiency promised by the integration of compute, storage and networking offers is tempting to IT pros. The potential to differentiate product offerings in the face of commoditization is attractive to vendors. The larger questions are whether either of these expectations can be realized to achieve greater datacenter efficiency and what the move to new product categories means for the IT marketplace. Enterprise IT teams have to change operational behaviors to gain benefits from converged platforms. Who is ready, and how quickly can they adapt?

EVERY BUSINESS IS ON A JOURNEY TO THE CLOUD

The move to the cloud is a generation-long journey and not an overnight transformation. The speed and strategic approach is unique to each firm but the questions are same. Which workloads would benefit most from cloud deployment? How much rewriting, modernization and re-platforming is needed? How do we integrate and manage this new environment with limited disruption and maximum ROI? What happens when something goes horribly wrong?

The Digital Infrastructure Summit builds on the research of analysts like William Fellows, Peter ffoulkes, Carl Lehmann, Owen Rogers, and Al Sadowski, who focus intently on the adoption and development of cloud in the enterprise.

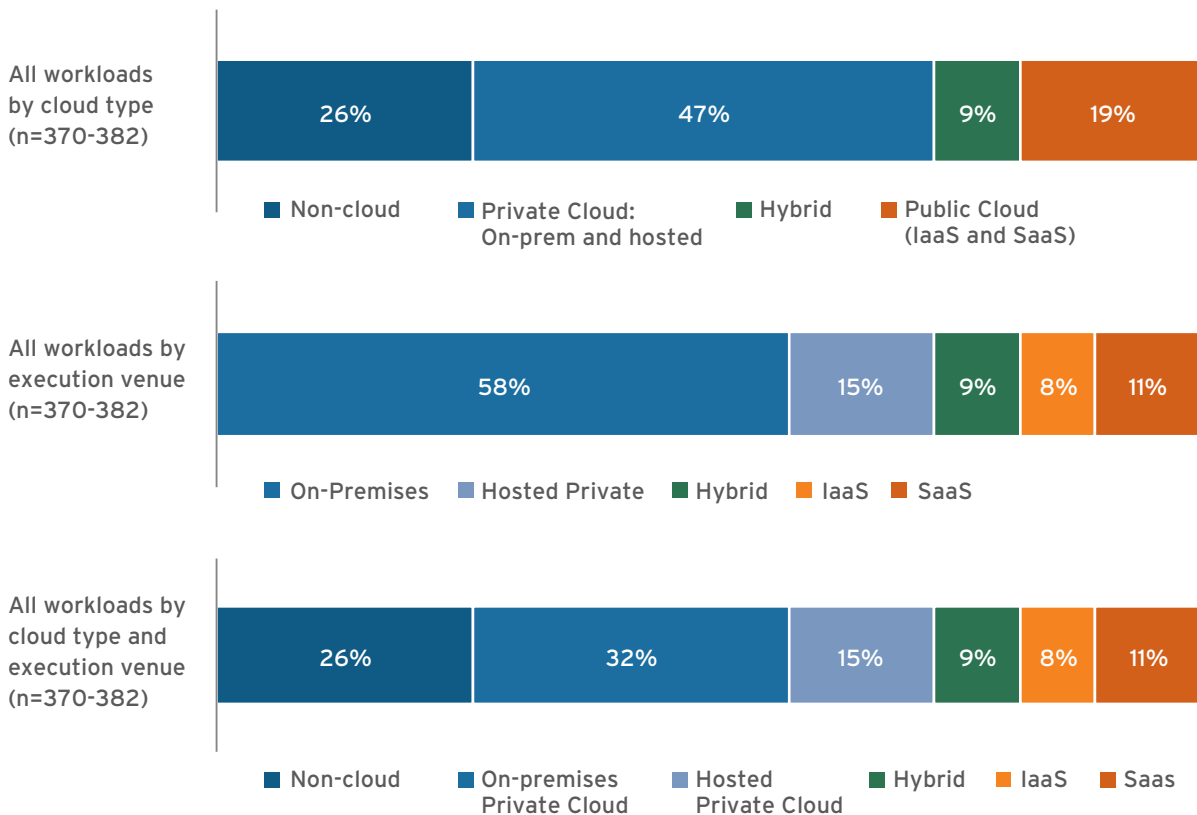
PACE OF THE CLOUD TRANSITION FOR ENTERPRISES.

Our Voice of the Enterprise: Cloud Computing research reveals that within two years, roughly three-quarters of enterprise workloads will use one form of cloud deployment or another – with 47% in a private cloud, 9% in hybrid clouds and 19% in public cloud IaaS or SaaS environments, and the remainder in traditional, non-cloud deployment.

Workload Deployment by Cloud Type and Execution Venue

CLOUD USE RESPONDENTS

Q. Over the next two years, what will your primary deployment method most likely be for each of the following workloads.



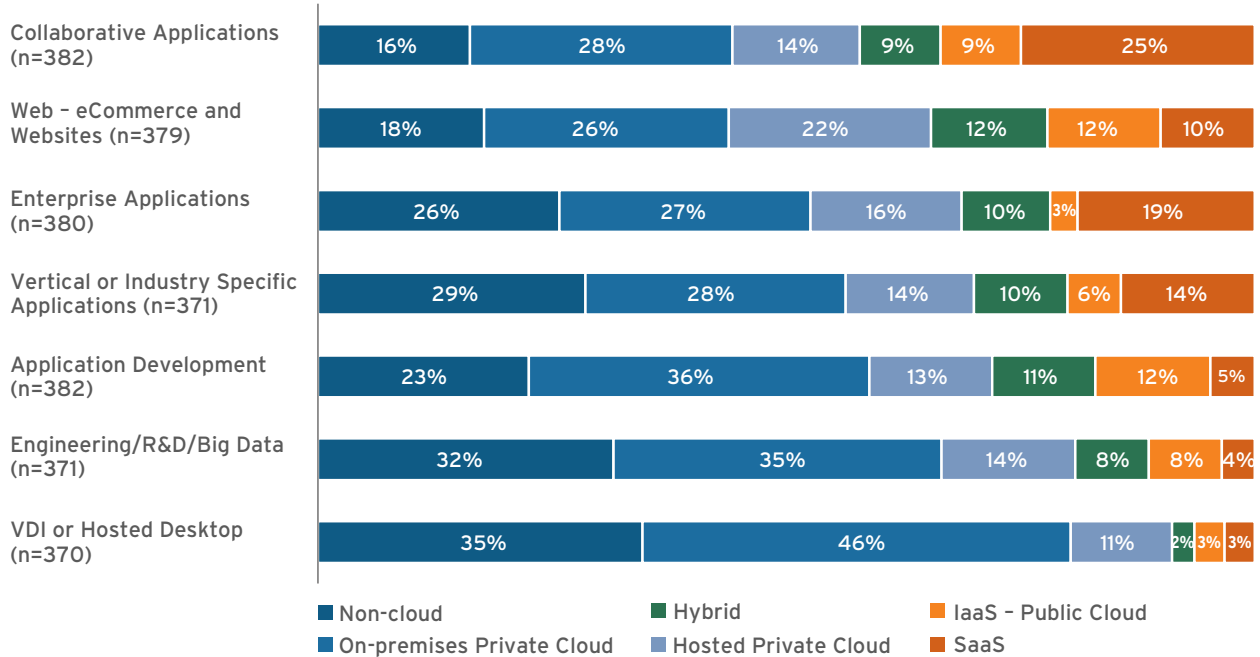
CHALLENGES OF DETERMINING WHICH WORKLOADS WHEN.

In plain English, Best Execution Venue (BEV) is the idea that every class of IT-related business need has an environment where it will best balance performance and cost, and the IT organization should be able to select that environment as part of the general practice of IT. The term has its origins in the financial world, where it refers to the ability to place orders and trade stocks in the best possible environment to maximize return.

Workload Deployment

CLOUD USE RESPONDENTS

Q. Over the next two years, what will your primary deployment method most likely be for each of the following workloads.



HYBRID CLOUD STRATEGY.

Hybrid multi-clouds are becoming a de facto IT architecture for nearly all enterprises. Orchestrating business processes and integrating applications is challenging as workloads shift to exploit the price and elasticity of various cloud services. The tools and technologies needed to craft and manage hybrid multi-clouds as part of IT architecture are fragmented and ripe for vendor innovation. Currently, half of enterprises report running production applications in a cloud. Many enterprise leaders anticipate the use of multiple cloud services in the next three years. As workloads, data and processes shift across multiple on-premises, hosted, private and public cloud services, a new approach to development, deployment, integration and management will be called for – one that requires awareness of business processes, data and application integration flows. Enterprises will demand that IT vendors craft a holistic and uniform means to allocate workloads to the best execution venue (BEV) while managing business continuity across what is now becoming a hybrid multi-cloud enterprise architecture.

OPENSTACK AND CLOUD MANAGEMENT.

Now more than four years old, OpenStack is moving into the mainstream of cloud computing infrastructure. 451 Research Market Monitor projects OpenStack ecosystem revenue in excess of \$3.3bn by 2018. Almost three-quarters of the revenue will come from service providers with public and private clouds built on OpenStack. But enterprises are looking at open source cloud platforms too, lured by the promise of flexibility, modularity, lower cost and nonproprietary technology for their own cloud implementations. For many, the choice between open source options like OpenStack, CloudStack and Eucalyptus (acquired by HP) and proprietary offerings from VMware and Amazon Web Services is the next big step in their journey to the cloud. OpenStack and its peers promise the things that enterprises both love and hate about open source. The appeal of flexibility, lower cost and no vendor lock-in are often offset by fear of the lack of support in the do-it-yourself engineering model, hidden costs and the unpredictable cadence of product development in open source. In the case of OpenStack, enterprises and service providers point to the impressive roster of technology leaders supporting the OpenStack Foundation and the momentum behind the community as deciding factors in the selection process. But deploying this technology still requires a lot of currently scarce technical expertise, so enterprises need to be sure they have the right use cases in mind before wading in.

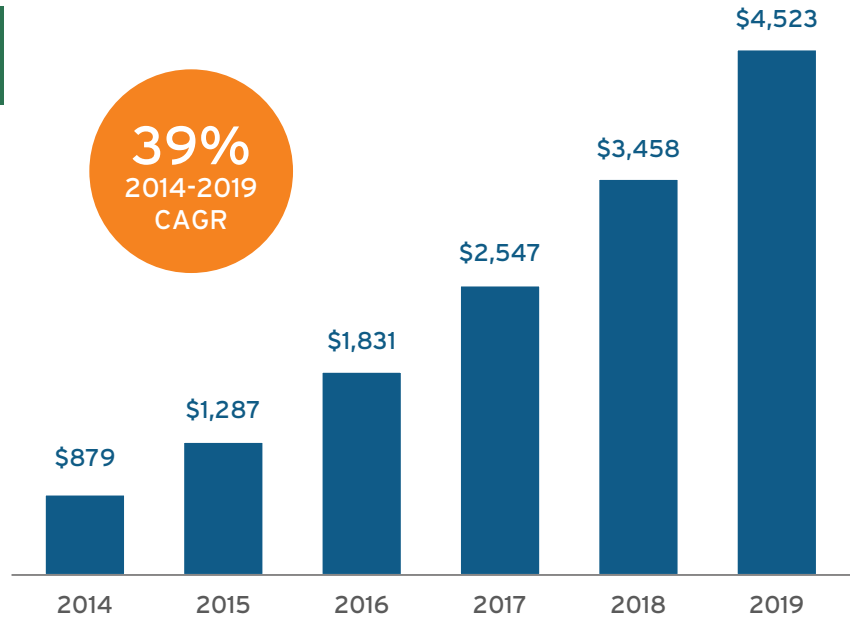
Total OpenStack Revenue (\$M)

Source: 451 Research Market Monitor

76 | VENDOR INCLUDED
IN THIS ANALYSIS

5 | OPENSTACK MARKET
SECTORS EXAMINE
INDIVIDUALLY

- Products, Distributions and Management
- Cloud Management
- DevOps Tools
- OpenStack Service Providers
- PaaS Providers



PUBLIC AND PRIVATE CLOUD PRICE INDEX.

To examine the real-world cost of cloud over time, 451 Research has created the Cloud Price Index. Like a consumer price index, our CPI is made up of a basket of goods, but in our case it is a specification of the services required to operate a typical Web server application. Changes in the CPI over time will show how modifications and differences in pricing in the cloud industry are reflected in real-world use. The CPI is the specification of a multi-service three-tier cloud application consisting of Linux VMs, object storage, block storage, relational databases, NoSQL databases, load balancing, access control lists and snapshot backup in a resilient architecture.

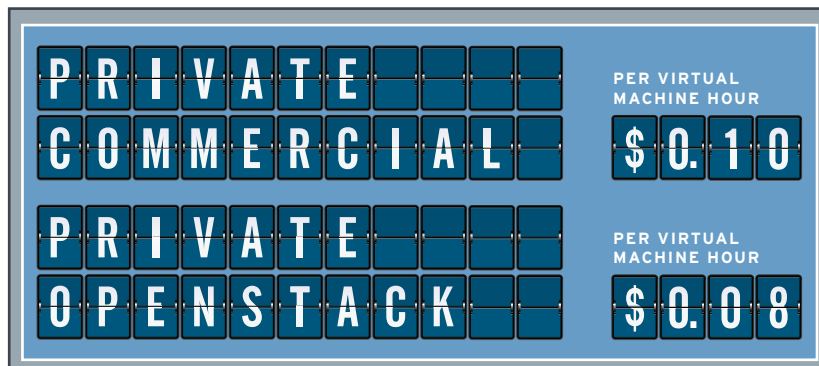
PRIVATE CLOUD.

Public and private cloud may be variations of the same concept, but practical procurement is very different. Public cloud has openly available pricing, is charged related to consumption, and is billed to a credit card — it might not be easy to assess cost and value, but at least it is possible. Private cloud is still procured like traditional IT: ‘custom’ is the keyword here, and pricing, design and payment terms are all specified on a per-customer basis. The Cloud Price Index — Private Edition should help breakdown this hidden landscape of pricing by revealing average prices and TCOs for a range of options, including software and management. Together with the Public Edition, the Cloud Price Index provides a transparent view of the cloud market pricing landscape.

APRIL 2015

Cloud Price Index

SOURCE: 20 private cloud vendors & service providers

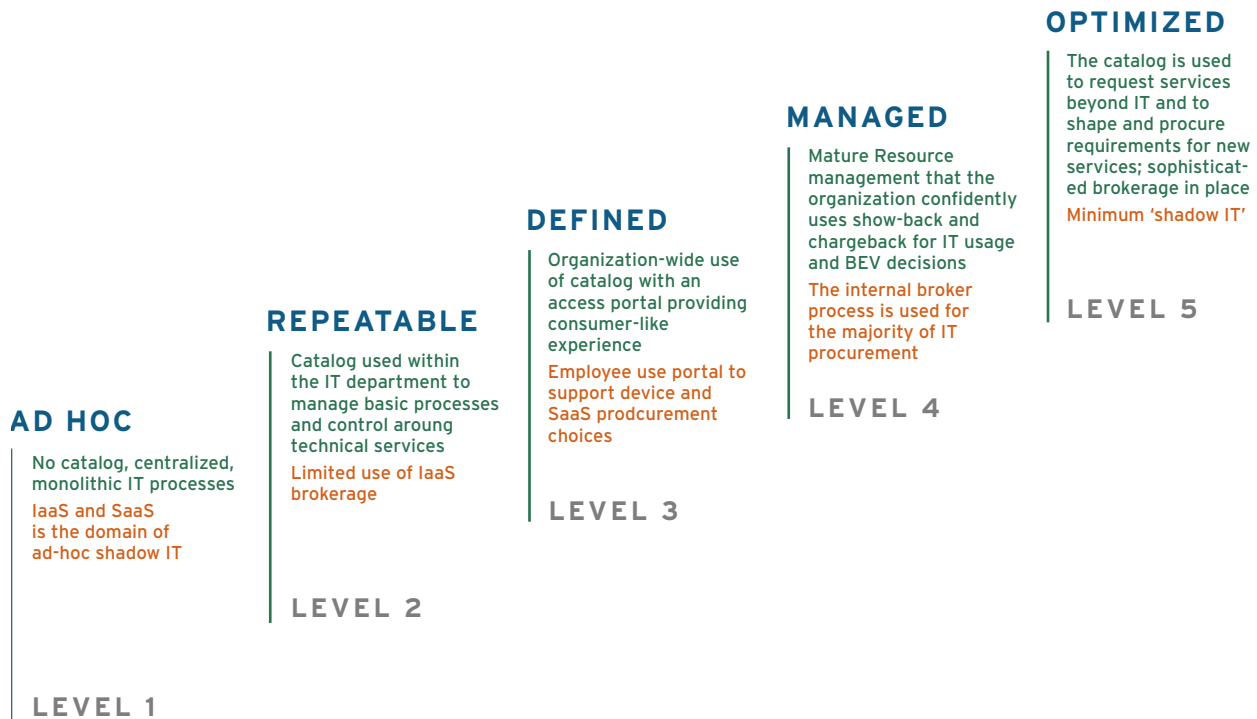


IT SERVICE DELIVERY IS BEING REWRITTEN TO SUPPORT ITAAS MODELS

Everyone is talking about IT-as-a-service, a competitive business model where IT creates services for the business and competes against external providers. A major part of the cloud journey is assembling the internal technical capabilities – cloud-enabled management platforms and integration tooling across and between cloud environments – and the service-delivery model – the skills, metrics and service management know-how that the IT team brings. 451 Research Director for Global IT Services Katy Ring will lead a session on how internal IT organizations can embrace ITaaS creation and consumption models and define their role in emerging digital service ecosystems.

ITAAS MATURITY MODEL.

From a technology point of view, enterprise IT organizations now need to be able to provide a unified front-end experience via a portal that enables access to a service catalog, which can seamlessly link to other catalogs from external service providers as necessary. And this all then needs to integrate with a unified backend capability managing assets, policies, pricing and governance. The ultimate goal is to make it easier for internal IT to deliver services and mandates on governance and cost optimization, while also providing a strong user experience that eliminates shadow IT. This requires the IT department to be both the broker and control point between commercial external suppliers and internal providers and employees, enabling departments to purchase services directly with their own cost budgets. The 451 Research ITaaS maturity model is a useful in pinpointing current capabilities and deciding where you want to get to.



REFERENCES (IN ALPHABETICAL ORDER)

All the research referenced in this report is provided in PDF format as a thank you for attending the Digital Infrastructure Summit

A HYBRID IT REFERENCE ARCHITECTURE FOR MULTI-CLOUD INTEGRATION AND MANAGEMENT

CLOUD PRICE INDEX - PRIVATE EDITION, PART 1: THE PRIVATE LIVES OF PRIVATE CLOUDS

CLOUD PRICE INDEX - PRIVATE EDITION, PART 2: A TWO-CENT 'TAX' FOR COMMERCIAL CODE

CLOUD PRICE INDEX - PRIVATE EDITION, PART 3: THE BEST VALUE TCO FOR PRIVATE CLOUD?

CLOUD BROKERS: MAKING ITAAS A PRACTICAL REALITY

ENTERPRISE IT SPOTLIGHT: DATACENTER SERVICE OPTIMIZATION (DCSO) SOFTWARE

ENTERPRISE IT SPOTLIGHT: OPENSTACK CLOUD PLATFORM

INTEGRATED PLATFORMS: DISRUPTION OR JUST DISTURBANCE

OPEN SOURCE CLOUD PLATFORMS: OPENSTACK

REFERENCE ARCHITECTURES AND ENABLERS FOR SOFTWARE-DEFINED ENTERPRISES

VOICE OF THE ENTERPRISE: CLOUD COMPUTING

VOICE OF THE ENTERPRISE: DATACENTER