Hybrid Cloud Solutions

IIS HYBRID CLOUD SOLUTIONS

International Integrated Solutions, Ltd. (IIS) is a Systems and Cloud Services Integrator specializing in six (6) practice areas: Hybrid Cloud, Big Data, IT Transformation, Data Center, IT Infrastructure, and Managed Services.

Our Hybrid Cloud Solutions value proposition to our clients is very unique because we take a vendor agnostic approach to help our clients determine the Best Execution Venue (BEV) for their hybrid cloud workloads and then integrate those solutions to help them meet their expected business outcomes. We start every engagement by focusing on our client's business requirements, profiling their applications or use cases and then documenting their technical requirements before developing a solution.

Our Cloud Services Integration (CSI) portfolio consists of enablement services for clients that do not have the in-house experience or expertise to help them become a service broker, deliver ITaaS or implement various public cloud solutions. Instead, our clients rely on our architects, engineers, and PMO, which leverages a cloud adoption framework & methodology to consistently deliver high value projects, on-time and within budget.

Each engagement can be customized and consist of activities that range from planning, designing, deploying, operationalizing, and optimizing a variety of Cloud Management Platform (CMP) and Cloud Service Brokerage (CSB) solutions. CMP projects can include helping our clients select and implement the right Cloud Management Platform software from VMware, HP, Microsoft or RedHat, and building out service catalogs. CSB or public cloud service provider solution projects can revolve around design and deployments on AWS, Azure or VMware based IaaS platforms, as well as support of our clients Desktop as a Service, Backup as a Service, and Disaster Recovery as a Service needs

IIS is headquartered in Plainview, NY with offices in New York, NY, Danbury, CT and Boston, MA.

REPORT REPRINT

The Best Execution Venue

POSITIONING FOR THE NEXT WAVE OF CHANGE IN ENTERPRISE IT INFRASTRUCTURE

As automation and consumerization become the dominant paradigms for designing and deploying IT infrastructure, these trends will also extend to the next frontier of IT-shop modernization: systems management and higher-level automation. This report identifies and examines the current state of enterprise adoption of private, public and hybrid clouds by workload using original survey research.

KEY FINDINGS

- The adoption of best execution venues (BEVs) varies according to workload complexity and the level of demand.
- Despite the hype, the transition from traditional IT architectures to a cloud-based future is a slow, organic process that will continue developing for years to come.
- For each class of workload identified by 451 Research, there exists some level of service-delivery capability and thriving interest. Some workloads can already be considered to have viable BEVs, thanks to clearly defined needs and available technology services.
- Security remains the largest barrier to adoption of external services; however, this is beginning to be addressed by providers.
- Current trends in cloud management tools are making it more viable for IT organizations to consider a strong mix of IT providers without resorting to outsourcing operations.
- Hybrid clouds will be a predominate model for underlying infrastructure services.

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SECTION 1 : EXECUTIVE SUMMARY

As automation and consumerization become the dominant paradigms for designing and deploying IT infrastructure, these trends will also extend to the next frontier of IT-shop modernization: systems management and higher-level automation. This report identifies and examines the current state of enterprise adoption of private, public and hybrid clouds by workload using original survey research. It further examines future trends in best execution venues (BEVs). Today, an admin can easily select, configure, provision and deploy the IT stack needed for any given workload, whether from a virtualized resource farm in-house or from external providers, and these resources can be connected like a child's construction set with common interfaces – provided that the enterprise has executed a strategic commitment to the cloud computing model.

The next step is bringing those ideal states – that is, the BEV for a defined IT need – to the same level of automation. We are within sight of the application being able to select and maintain the IT environment it requires, with the same ease a user boots a server in the cloud. This report details trends, adoption and strategies for enterprises and service providers to identify the BEV, and position themselves to meet upcoming demand.

1.1 INTRODUCTION

The purpose of this report is to show the approaches that enterprises are taking to best deploying needed IT workloads – internally, externally with a provider, or in some combination – in the cloud computing model. We have used end-user adoption data gathered by 451 Research and TheInfoPro (a service of 451 Research) to show the choice of venue for a number of classes of identified workloads. Specific solutions are always dependent on specific situations, but given the fundamental role that IT plays in how a business functions today, the identification of different workloads and a given environment's applicability and suitability must take into account the rapidly evolving and maturing constellation of cloud services.

This report uses the IT workloads that 451 Research has identified as part of the overall trend in the adoption of cloud computing, as well as user-survey data and market-sizing data, to show statistical trends for various workloads. It also analyzes the availability of BEVs for each class of IT need. The scope of this report is not to be a strategy guide for every extant IT workload, but to give enterprises and service providers a view of the market for each workload, so they can craft an informed strategy on their own.

For enterprises, this report attempts to be a guide to the relative availability of BEVs for each workload, to examine strategies for improving IT operations and uptake of services by competitors and colleagues, and to provide a vision for improvements to application delivery. For service providers, this document is a snapshot of the opportunity to meet identified enterprise needs and continue the trend of absorbing workloads that outgrow or overshadow enterprise IT capabilities and capacity, so they can tune go-to-market strategies to meet evolving enterprise demands.

The BEV for any workload is a two-sided coin. For the user or IT organization, it is a place that obtains the best results at an optimal rate of investment for a given IT need. For service providers, it's a specific stack or special area of expertise that can be profitably handed over and integrated into enterprise IT operations. In short, it is the next way to improve IT-service delivery from IT organizations to their users, and from service providers to IT organizations.

1.2 KEY FINDINGS

- The adoption of BEVs varies according to complexity and the level of demand.
- Despite the hype, the transition from traditional IT architectures to a cloud-based future is a slow, organic process that will continue developing for many years to come.
- For each class of workload identified by 451 Research, there exists some level of service-delivery capability and thriving interest. These workloads are:
  - Customer-facing enterprise applications
  - Back-office enterprise applications
  - Batch computing applications

  - E-business hosting
  - Collaborative applications
  - Test and development of applications
  - Cloud-native applications
- Security remains the largest barrier to adoption of external services; however, this is beginning to be addressed by providers.
- Current trends in cloud management tools are making it more viable for IT organizations to consider a strong mix of IT providers without resorting to outsourcing operations.
- Hybrid clouds will be a predominate model for underlying infrastructure services.
- Some workloads can already be considered to have viable BEVs, thanks to many years of clearly defined need and available technology services.
- For many of the above workloads, considerations for use are based entirely on process and policy, and they can be considered mature parts of the IT services market.

1.3 METHODOLOGY

This report on best execution venues is based on a series of in-depth interviews with a variety of stakeholders in the industry, including IT managers at end-user organizations across multiple sectors, technology vendors, managed service providers, telcos and VCs. This research was supplemented by additional primary research, including attendance at a number of trade shows and industry events.

Reports such as this one represent a holistic perspective on key emerging markets in the enterprise IT space. These markets evolve quickly, though, so 451 Research offers additional services that provide critical marketplace updates. These updated reports and perspectives are presented on a daily basis via the company's core intelligence service – 451 Market Insight. Forward-looking M&A analysis and perspectives on strategic acquisitions and the liquidity environment for technology companies are also updated regularly via 451 Market Insight, which is backed by the industry-leading 451 M&A KnowledgeBase.

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SECTION 2 MODELING THE IT INFRASTRUCTURE OUTCOME ON DEMAND CHARACTERISTICS: THE BEST EXECUTION VENUE

BEV is a concept that rationalizes the current trends around automation, self-service and the rapidly commodifying IT infrastructure within the overall context of running a business. It presents the IT practitioner 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 trade stocks in the best possible environment to maximize return. It became mainstream after the implementation of The Markets in Financial Instruments Directive (Directive *2004/39/EC)* in the EU, which formalized and standardized the policy-driven automation of trading practices throughout the EU zone, and made it possible to optimize the choice of trading venue in ways that had direct value. Consequently, a cottage industry of services to locate and provide the BEVs for trading has sprung up around the world, enmeshing technology, data, practical experiences and software-driven management to create value for financial traders.

This is not the first time the financial world's need for systemization has impacted IT. The standards for compliance in IT operations, now used by nearly every IT organization and provider as a baseline for conducting operations, came from the world of accounting decades ago. The venerable Statement on Auditing Standards No. 70 was the system of record, until replaced by the Statement on Standards for Attestation Engagements (SSAE) No. 16 in 2010. To this day, SSAE 16 is still overseen by the Auditing Standards Board of the American Institute of Certified Public Accountants. The concept of BEV has the potential to rival the importance of those accounting standards – that is, to become fundamental to how IT operates.

In plain English, the 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 (or even have the application select it automatically) as part of the general practice of IT. It can be basic. If all that's needed is a place for a handful of workers to share and store files, the BEV is either a file server (and backup solution) located in the most convenient place that meets whatever access or security concerns are in play. For a multifaceted collaborative online application – involving multiple stakeholders, regulated data forms (like health or payment data), a mix of ongoing development and operations, and multiple domains of IT (servers, storage, code delivery, Internet services like DNS, CDN and security services) – the answer will be considerably more complex. Then, the BEV may be a mix of processes, technology, and internal and external service delivery from both the IT department and third-party service providers, which work as a holistic, repeatable, improvable whole.

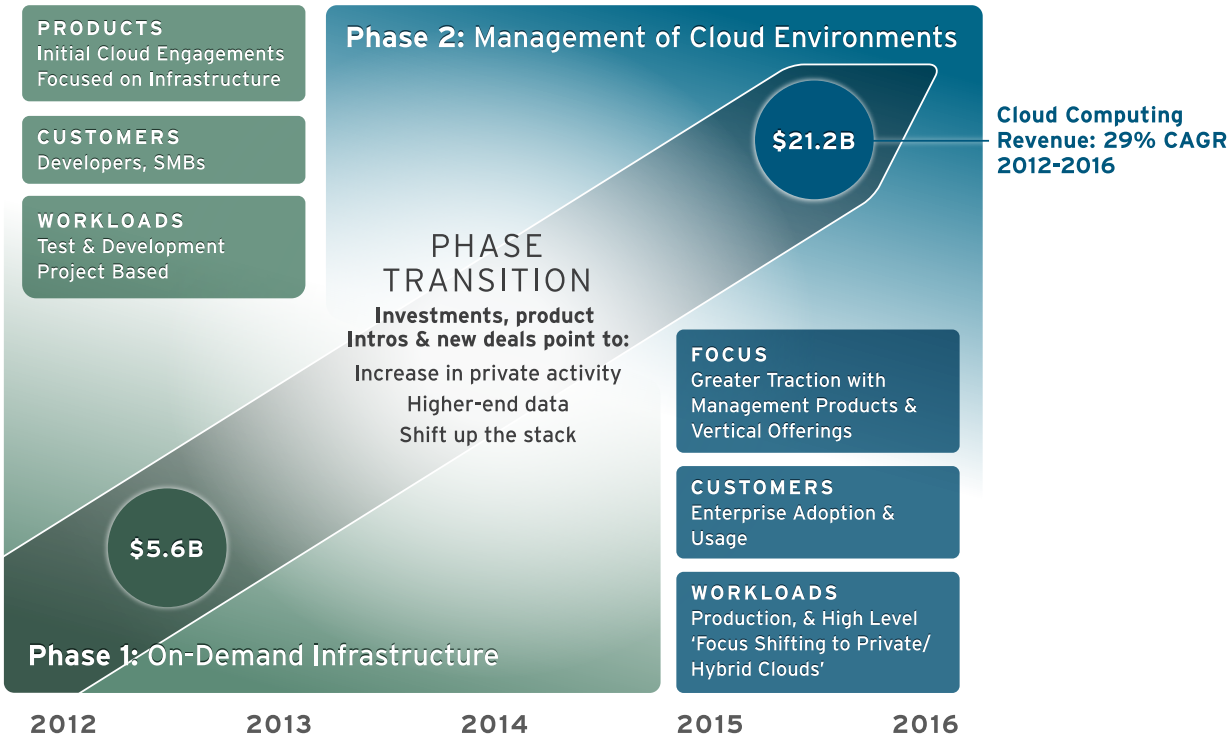
2.1 AREN'T I JUST PICKING A SAAS PROVIDER?

For many IT needs, the BEV already exists and is served by the Web- and application-hosting market, which ranges from hosted email to hosted websites and databases, content management, storage and backup, many security solutions, content delivery, and so on. As more IT needs become rationalized and productized, point-specific SaaS takes over and becomes the default answer to a defined need. But the need for enterprises to control, develop and maintain their own applications isn't going away – the need for infrastructure to be under the control of the IT organization, but provisioned from external sources, is growing steadily. That is where the question of BEV remains open.

2.2 RESOURCE MANAGEMENT IS INCREASINGLY IMPORTANT

Resource management is increasingly important for enterprises and providers that are adopting external IT infrastructure in the manner of the cloud (highly self-directed by the end user, quick to provision, consumed on demand, and often in conjunction with multiple existing IT operations all controlled by a central IT group) because the IT world is moving past considering the underlying technology platforms and the technical ability to provision IT infrastructure. Once again, the paramount considerations are management systems and control points to wrangle those multiple systems into a cohesive whole:

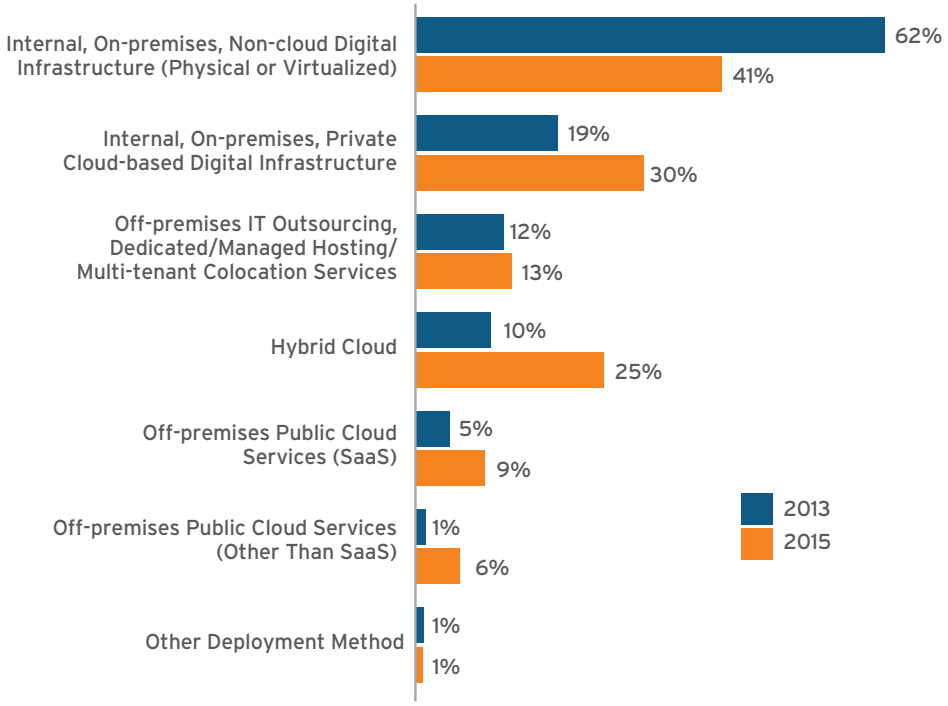
FIGURE 1: CLOUD 'AS-A-SERVICE' PHASES OF ADOPTION



2.3 THE HYBRID CLOUD WILL BE THE MODEL

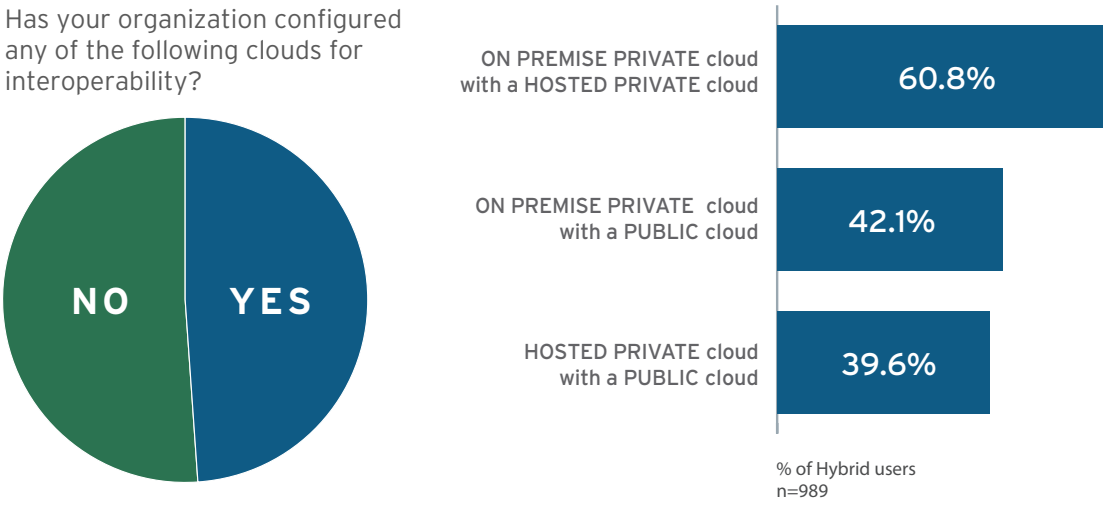
Overall growth of enterprise spending on IaaS/PaaS continues to grow, as does the share of money spent on managed infrastructure services, with the strongest growth happening in hybrid clouds – multiple sources of infrastructure managed holistically by the enterprise consumer:

FIGURE 2: USAGE OF DIGITAL INFRASTRUCTURE AND CLOUD TECHNOLOGIES AND SERVICES



A separate 451 Research survey of hosted infrastructure customers in 2014 shows that hybrid cloud-multiple infrastructure environments – both owned by the enterprise and rented/consumed from external providers – is about half of all IaaS consumption:

FIGURE 3: THE HYBRID CLOUD MODEL WILL PREDOMINATE



n=2002, Commissioned by Microsoft

As the data clearly indicates, supervisory control and perceived ownership of IT assets are the primary ways enterprises want to interact with their owned and external cloud infrastructures. Well over half of survey respondents said they have enabled a level of interoperability between their own assets and that of a hosted private cloud environment – a segregated, dedicated pool of infrastructure managed by the provider and used by the enterprise IT organization to control computing resources. All of these responses are leading indicators. 451 Research expects this trend to continue long term, until essentially all IT infrastructure consumed by the enterprise is either prepackaged, commodified and fungible (like website hosting), or hybridized under a single plane of management and control by the enterprise. This is how the hybrid cloud will inform BEV strategies over time.

As a method of improving IT operations and considering strategy, the BEV depends on software automation and control planes to the full extent possible within a given workload type. It is equally dependent on consuming external IT resources that are not necessarily owned or operated by the IT organization, as well as the existing internal, enterprise-owned IT assets. The concept of direct ownership of assets and access to underlying physical stacks continues to lessen in importance, in favor of automation and management and increasing integration with management software. Combined with the adoption of managed infrastructure, IaaS and PaaS, the ability of an IT manager to select and manage the best environment for any given task is becoming more streamlined.

2.4 REALITY CHECK

A lot of the BEV concept's potential is pie in the sky for most enterprises, but it's rapidly becoming a norm for technology-forward organizations. It's not hard to envision applications and services automated and flexible enough to pick their own best environments based on triggering criteria (performance, price changes, surge in demand). We can already see this happening. Sophisticated online services like Netflix and YouTube, and lots of Web properties, invest huge amounts of energy and code into ways to respond to exactly those situations, and environments like Amazon Web Services (AWS) explicitly enable those properties. In short order, we will see applications that 'follow the sun' to optimize capacity, as a global audience grows and shrinks according to the time of day. The largest online businesses (eBay, Facebook, Google, Amazon, etc.) already construct their own datacenters and online services as exercises in BEVs, because they perceive IT as the basic commodity that makes their companies money.

In most enterprises, this kind of hyper-consideration of every facet of operations lags far behind – with the general exception of Web-facing retail, sales and marketing operations that drive business into an enterprise, IT operations are still a cost center. The incentive to build out a fabulously high-performing stack for bread-and-butter IT is just not there. So how to square what is obviously the preferred idea of BEVs with the dreary reality? Look to where these venues already exist and/or can be constructed with a minimum of fuss. Generally, this means using external specialized and semi-specialized service providers, and increasing the sophistication of the IT department's control.

As with all things cloud, much of the forward motion in BEVs is driven by the consumerization of IT, as well as increased expectations. IT consumers within the enterprise expect to be able to make rational decisions about how and where to run applications and tasks based on workload profile, policies and SLA requirements. The question of whether a technology can be had as a service is vanishing and becoming an academic one – literally. Research institutions requiring sole access to custom supercomputing installations are the last bastion of uncommercialized IT infrastructure available as a service, and on-demand HPC services will encroach as connectivity options improve

2.5 HANDS ON THE REINS - OF EVERYTHING

As the worlds of outsourcing, hosting, managed services and the cloud converge, the options are growing exponentially. BEV strategies – and the execution engines that underpin them – will enable users to determine which services are right for their needs as part of an overall digital infrastructure. Successful BEV strategies will likely mean owning and operating fewer assets, while at the same time integrating additional hosted resources. The most sophisticated IT users may operate these supplier relationships independently. But even those with contract-negotiation expertise will probably struggle with the complexity of the mechanisms available, especially in relation to the pricing and delivery of cloud services. The reality is that most organizations have access to more than a handful of cloud-infrastructure services – the same kind of access they probably have to other utilities. Indeed, where they do exist, these are mostly bilateral sourcing relationships between the end user and service provider.

We expect that third-party tools including technical and financial cloud brokers, business-application marketplaces and other integrators will therefore play an important role in providing access to other venues. Some applications, workloads or service requests may be best suited to running on-premises. For others, a public multi-tenant cloud may be sufficient, while still others may need a dedicated hosted venue. Major industry players want to own and oper-

ate the control plane, catalog or console that can automate the scheduling, delivery and access to services as part of their BEV strategies – as well as provide the venues themselves in many cases. As they seek to raise their software IQ and meet raised expectations of technology in the workplace based on the consumer experience, delivering an 'IT vending machine' experience to end users will require IT departments to become service brokers to their own organizations. BEV-sourcing strategies will be key to achieving this. Moreover, the cloud's service-driven, usage-based consumption model will turn traditional IT cost centers into service-delivery organizations.

2.6 SECURITY: FIRST, LAST, ALWAYS

When considering the use of IT infrastructure sourced outside enterprise walls, and getting to a BEV, security remains the paramount concern and hurdle to adoption. Largely, this is not a matter of technical security implementation. Almost to a fault, infrastructure providers have better core security practices and operations than enterprises do, simply because the stakes are higher, and it's the most visible topic during any discussion of use. The automated security practices of AWS's threat (and misuse) detection, and its response and mitigation systems that run on and around its infrastructure, are well out of reach for even the most sophisticated enterprise environments. However, that is only part of the security conversation when looking at how an application is relevant to an enterprise. Decisions must be made about what data can and cannot be stored in certain locations (thanks to compliance regulation like HIPAA and PCI DSS, and state regulations), where responsibility lies for breaches, and so on.

For the enterprise, the security bugbear is the first factor in determining where and how a potential workload can take advantage of external services. For customer-facing e-commerce sites, for instance, AWS might be the ideal place to construct and manage a Web presence and deliver services, media or retail purchasing options to the consumer. But how does the enterprise ensure that personally identifying customer information isn't vulnerable? Answers range from hiring auditors and security experts to build and certify applications as safe, to integrating a third-party payment processor, to maintaining hybrid infrastructures that direct one flow of information to a 'secure' datacenter, while the rest stays on 'the cloud.'

All of this has to happen in the context of general security practices, such as ensuring the application isn't vulnerable to attack, or leaving entry routes into other enterprise systems – as was the case with the blockbuster Target breach in 2013. All of this adds significant gravitas to something as seemingly easy as operating a customer-friendly website on an ideal platform, and can thus be the largest snarl in any plan to adopt. But the pressure to do more, and do it faster, for the same amount of money is immense – so providers are beginning to fall into a recognizable pattern to combat this scenario.

The first approach is to differentiate on security by making it part of the managed infrastructure service experience. Most providers can give users decent visibility and access to the secure environments they provision. Delineation of responsibility for sensitive data is firmly embedded and indemnified in contractual language and project planning, etc. The second is to specialize – there is a growing vertical of cloud providers that can offer compliance as a service, with audit checks and certification for the enterprise automated, streamlined and baked into the service delivery. Some examples include Verizon's managed services, Carpathia, INetU and Online Tech. This is found in varying forms, from the provider simply having lots of expertise in compliance regimes and an efficient set of practices around delivering it, to the beginnings of automated, user-friendly dashboards and reporting systems that follow the buffet service trend of cloud computing. This trend will continue to grow, but for now, it remains a value-add for providers. Another way around security concerns is using managed security services that automate a great deal of online security practices and free up resources for IT security teams to look after specific concerns. This is part of the larger trend toward more infrastructure management.

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