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Evolving the Enterprise Hybrid Cloud

Tata Communications: The Dark Horse in the Hybrid Cloud Race

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Introduction¹

Faced with ever-increasing business demands, many enterprise IT departments have accepted that hybrid IT is the best model to help them achieve their goals. Hybrid cloud, which Frost & Sullivan defines as integrating multiple IT environments and deployment models under a common management and orchestration platform, enables businesses to choose the infrastructure type that best suits each workload being deployed, while still managing them together as a single pool of resources.

Many providers in the market offer hybrid cloud enablement services, but providers differ in the breadth and depth of infrastructures, hypervisors, and operating systems their hybrid cloud platforms support. As a result, hybrid cloud definitions and capabilities vary based on the provider offering the services.

For global enterprises seeking to standardize on a provider with a hybrid enablement platform that can manage a very wide array of resources, Indian communications provider Tata Communications may be just what the company needs to achieve its hybrid goals. The company's hybrid enablement platform spans many popular hypervisors and operating systems, as well as two of the most popular public clouds used by businesses today. Though Tata's US presence is small to date, its ability to serve multi-national businesses is great, and worthy of consideration as a cloud partner.

In this SPIE, we discuss what businesses are looking for in an enterprise-grade hybrid cloud, and assess the offer that Tata Communications has brought to market. We will discuss the benefits of the Tata hybrid cloud, and why Stratecast|Frost & Sullivan believes it is a strong choice for enterprise IT environments, especially those operating on the multi-national stage.

The Evolution of the Hybrid Cloud

Stratecast|Frost & Sullivan has been covering hybrid cloud since 2009. At that time, many public cloud providers and industry experts were expecting businesses to go “all in” on public cloud, some stating that such a shift would happen within five years.

That prediction—one that our research contradicted—failed to consider enterprise needs that public cloud could not yet solve; specifically:

- Consistent application performance is difficult to guarantee in a public, multi-tenanted environment, where “noisy neighbors” can dominate available processing capacity
- Performance of latency-sensitive apps impacted by traversing the network

¹ In preparing this report, Stratecast|Frost & Sullivan conducted interviews with:

- Tata Communications – Srinivasan CR, Senior VP & Chief Digital Officer
- Tata Communications – Dechacca Ponnappa, Product Manager, Hybrid Cloud

Please note that the insights and opinions expressed in this assessment are those of Stratecast|Frost & Sullivan, and have been developed through the Stratecast|Frost & Sullivan research and analysis process. These expressed insights and opinions do not necessarily reflect the views of the company executives interviewed.

- Legacy applications that cannot be easily deployed in the cloud
- Businesses remain concerned about security and data privacy as cybercrime continues to mount and compliance requirements intensify
- An “all in” on public cloud “strategy” fails to consider the Total Cost of Ownership, especially for data center investments in hardware and space that are not yet at the end of their lifecycle

These concerns restrained many businesses from migrating the majority of their workloads to public cloud. Even in 2018, 48% of businesses responding to the Frost & Sullivan Cloud User Survey stated that cloud is only appropriate for less sensitive or critical workloads. Similarly, 61% state that while they place new applications into the cloud, they are not migrating legacy applications, many of which are critical to the business. Additionally, when implementing cloud in their business, 72% of survey respondents state that they still have concern over being locked in with one particular cloud vendor.

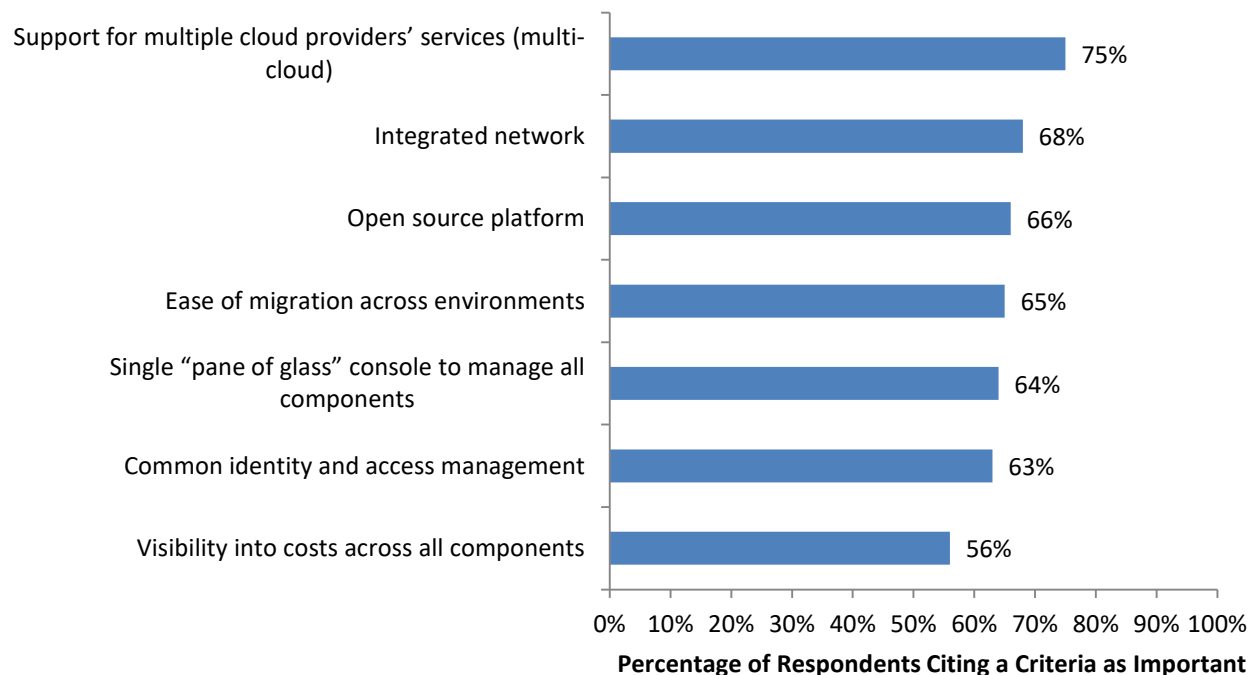
Based on these results, a hybrid environment—which enables single-pane IT environment management but allows for multiple, potentially disparate infrastructures to suit multiple workloads within that environment—is often the best solution to meet business needs, while mitigating concerns.

Hybrid Integration through Robust Orchestration

While infrastructure flexibility has been a critical component of the hybrid cloud for several years, customers’ expectations are increasingly moving toward greater integration of the infrastructures that they adopt into their hybrid environments.

Initially, customers cited a single-pane of glass management as the most important criterion in selecting a hybrid cloud platform. In 2015, 79% of Frost & Sullivan Cloud User Survey respondents cited single pane of glass management as important; and in 2017, 76% noted it was a key criterion in choosing their hybrid provider. But today, businesses are more focused on deep integration of infrastructures to ensure seamless deployment of applications that rely on APIs, micro-services, or serverless computing. This requires increased orchestration that extends from the infrastructure up the stack to the application layer, ensuring that applications can be developed and run regardless of environment. This puts an additional burden on hybrid management platforms.

Consider: although more than 60% respondents to the Frost & Sullivan 2018 Cloud User Survey ranked “single pane of glass management” as important or very important in selecting a hybrid cloud platform, it was ranked lower than other criteria. Today, customers are more interested in multi-cloud support, an integrated network, migration across disparate infrastructures, and common security policies, as shown below in Figure 1.

Figure 1: Criteria Important to US Businesses Seeking a Hybrid Cloud Provider

Source: Frost & Sullivan, 2018 Cloud User Survey

In a hybrid cloud era where customers seek more than just basic management functions from their hybrid platforms, orchestration through the cloud stack is needed.

So, what does the business look for in its chosen hybrid cloud? Primarily, enterprise customers seek choice and orchestration throughout all of the layers of the IT environment, from network to application. Of respondents to the 2018 Frost & Sullivan cloud user survey, 71% said that a hybrid cloud that integrates the greatest number of possible deployment options (including disparate public clouds, private clouds, and on-premises or managed hosting infrastructures) is important to them. Customers also cited integration through the cloud stack as important, as seen in Figure 1. As a result, customers are seeking vendors whose management platform supports a broad array of infrastructure types; and offers robust orchestration that integrates many disparate infrastructures, as well as the network and security functions.

Tata Communications: A Complete Hybrid Offering

Tata Communications is a provider of enterprise communications services and global hybrid cloud, with presence in India, Asia Pacific, Europe and the US. The company serves approximately 5,000 enterprise customers and 2,000 service providers that comprise 60% of the Standard & Poor's (S&P) 500; 66% of the Fortune 500; and nearly 70% of the PriceWaterhouse Cooper's 100 lists. Tata Communications has shown growth in its data services revenues since 2016, and is serving approximately \$46 billion of a \$1.1 trillion overall telecommunications market. Yet, Tata Communications is not a globally recognized cloud leader—even though the company has offered cloud services since 2010, and has a thriving portfolio of data center services. In fact, Tata

Communications has defied the trend of other global and regional network services providers by maintaining its global data center investments. As such, Tata Communications is among few providers that have full, end-to-end control over the cloud application infrastructure supporting its enterprise services.

In recent years, Tata Communications has evolved its cloud portfolio, shifting its focus away from standalone Infrastructure-as-a-Service (IaaS) and Software-as-a-Service (SaaS) offers that directly compete with the likes of AWS and Azure. Instead, the company has focused on developing a rich, integrated portfolio of hybrid and managed solutions that meet the enterprise's evolving needs for flexible infrastructure. As a global network and hybrid cloud service provider, the company is poised for growth in the lucrative, but highly competitive, US cloud market.

The Tata Communications IZO™ Cloud Platform

At the heart of Tata Communications' cloud strategy is the IZO Cloud Platform. The robust hybrid management and orchestration platform is based on OpenStack, and supports a broad array of infrastructures, hypervisors, and operating systems. While a number of platform providers handle hybrid management tasks (routine tasks that focus on the health of the environment), few have tackled orchestration (automation of infrastructure services that need to be executed in a particular order to support an application moving into production).

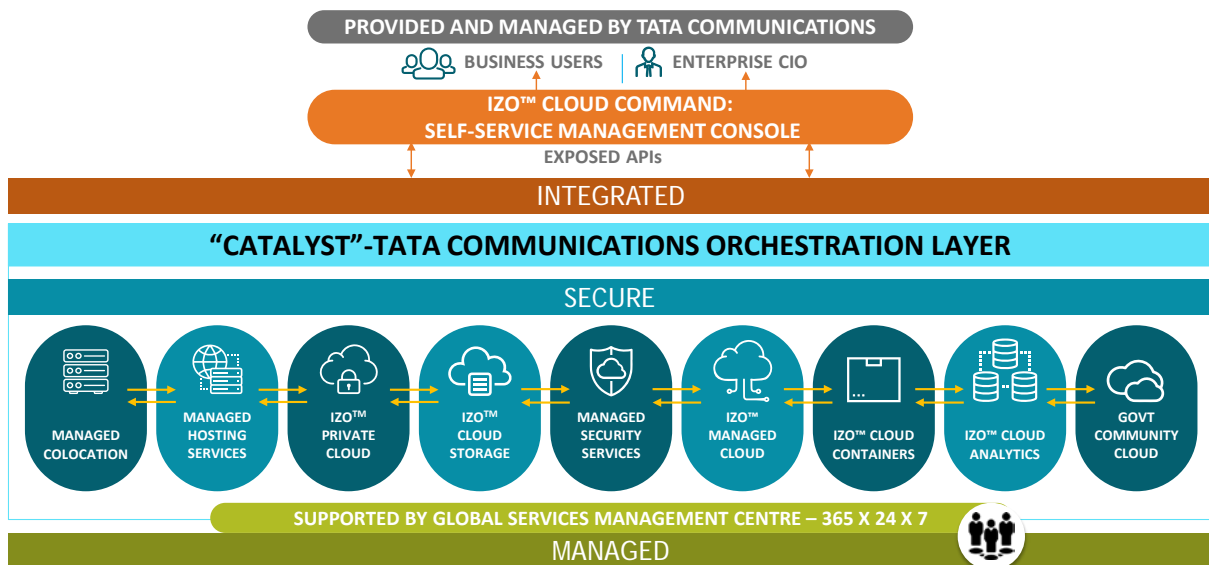
Tata Communications has developed a robust hybrid management and orchestration platform based on Open Stack, which supports a broad array of infrastructures, hypervisors, and operating systems. Tata Communications' platform, with its exposed APIs, goes beyond management, and enables hybrid orchestration that other hybrid platforms find more challenging.

Orchestration across disparate environments is difficult to engineer, because it requires insight and control over the underlying infrastructure. Yet, orchestration—not management—is what turns disparate infrastructures into the “seamlessness” environment that businesses are looking for.

Tata Communications' IZO Cloud Platform enables orchestration by exposing a rich set of Application Programming Interfaces (API). The platform supports not only multiple infrastructure environments (e.g., public cloud, private data center, co-location), but also a range of adjacent services offered by Tata Communications. Figure 2, below, shows the architecture of the IZO platform.

Figure 2: Tata Communications' IZO Cloud Enablement Platform Architecture**DIGITAL TRANSFORMATION IN A SINGLE PANE FOR ENTERPRISES**

BRINGS DISPARATE IT TOGETHER, PROVIDES CHOICE OF PLATFORM FOR EVERY WORKLOAD AND INTEGRATES SECURITY

*Source: Tata Communications, 2018***Hybrid Orchestration Capabilities**

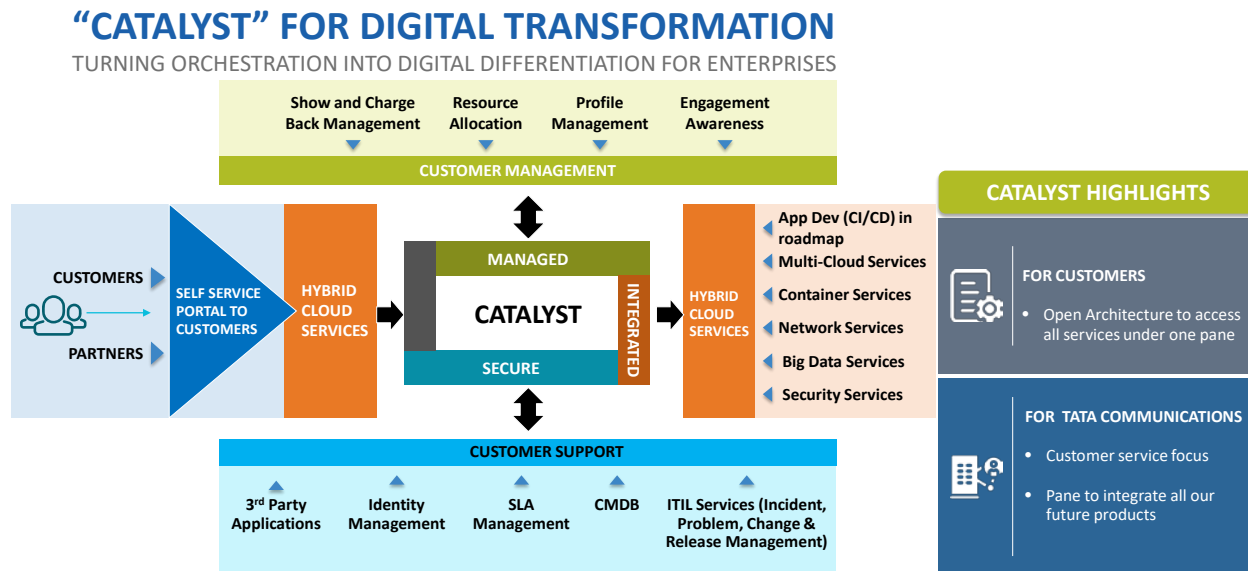
Tata Communications has built its Catalyst hybrid cloud orchestration platform on OpenStack, which supports a set of standard APIs that make it easy to integrate or migrate workloads, or to split applications and workloads into a hybrid configuration among a broad array of potential infrastructures. The platform automates orchestration tasks for:

- A variety of operating systems, including Windows, Linux, Ubuntu and Red Hat Enterprise Linux (RHEL)
- Multiple hypervisor technologies, including vSphere ESXi, KVM, and Hyper-V
- Public Cloud instances from AWS and Microsoft Azure

Robust Management

In addition to being able to orchestrate such a variety of disparate infrastructure types, the platform provides business management features for those platforms, including showback/chargeback by department, resource allocation, usage monitoring and metrics, and user profile management. An embedded workflow engine offers security; service level agreement (SLA) management; and third-party application integration and key Information Technology Infrastructure Library (ITIL) services such as incident management, or change and release administration. Finally, a customer-facing self-service portal enables self-service delivery of approved applications and services to both internal customers and partners. Figure 3, below, visualizes the Tata Communications IZO cloud enablement platform's capabilities.

Figure 3: Tata Communications IZO Hybrid Cloud Enablement Catalyst Orchestration Layer Capabilities



Source: Tata Communications, 2018

Integrated Security

Being able to configure security policies within the IZO Catalyst platform consistently, from the network layer through the infrastructure and application layers, in an overarching, policy-driven manner, ensures consistent security for the entire hybrid environment, whether infrastructure resources are based on the customers’ premises or in a hosted or cloud-based data center. Additionally, Tata Communications continues to enhance its portfolio of security and compliance certifications globally, to ensure that, regardless of where businesses are based, Tata Communications can meet the regulatory statutes of both the industry and the region.

Managed Services Integration

Inclusion of managed services within the IZO ecosystem is another benefit of choosing Tata Communications as a hybrid cloud provider. The IZO platform supports managed Hadoop services offered by Tata Communications. Other managed services available from Tata Communications, as well as sister unit Tata Consultancy Services, include:

- **Tata Communications IZO™ Cloud Analytics** – comprised of four distinct modules that can be deployed as necessary to meet the businesses’ needs. Modules include:
 - Managed Hadoop Enterprise
 - Big Data Lifecycle Management
 - Analytical and Visualization tools
 - Professional Services
- **Tata Communications IZO™ Managed Cloud for AWS & Microsoft Azure** offers customers a full suite of Azure management services that include:

- Consultation and design to configure and build your Azure services in a way that best meets business needs
- Building and migration to help with installation of the infrastructure and data migration
- Monitoring of the environment around-the-clock to ensure optimal function
- Management, including resource utilization and suggested changes for enhanced performance, suggestions for cost containment, incident and resource management, among other tasks
- Disaster site recovery
- Managed SAP on Azure

Application Modernization through Containerization

Tata Communications offers IZO™ Cloud Containers to help customers streamline their application modernization path. Tata Communications offers Docker containers as a cloud-based service through the IZO portal. Business developers can launch Docker containers through an IZO-integrated self-service portal using pre-configured templates and application images. Tata Communications IZO™ Cloud Containers offers three layers of security at the infrastructure, container, and access layers. The service can schedule containers for deployment, configure containers appropriately for the needs of the workload being deployed inside of it, move containers among supported infrastructures, and manage load-balancing and auto-scaling, all from the IZO platform.

Community Cloud

As part of its specialized security and compliance certifications, Tata Communications has created industry-specific community clouds—or private cloud infrastructures configured to meet the specific needs of a particular group or industry—that are guaranteed to meet the security and compliance specifications required by their industry. Today, Tata Communications offers a Government Community Cloud specific to the Indian government; and is working to expand its community cloud presence into the healthcare and financial services industries.

Tata Communications Hybrid Cloud Services

Atop the IZO™ cloud enablement platform, Tata Communications offers a suite of services that interoperate together in a seamless hybrid cloud—or smart hybrid cloud, as they call it. Tata Communications services that comprise the smart hybrid cloud include:

- **IZO™ Cloud Storage:** IZO Cloud storage offers high-performance, scalable cloud object and block storage, as well as efficient storage configurations for data archiving. Tata Communications has architected its IZO storage to be compliant with major regulatory statutes including HIPAA, HITECH, MCTS T3, and GDPR. IZO Cloud Storage can be configured and orchestrated via the IZO Private Cloud enablement platform.
- **IZO™ Cloud Ready Networks:** Tata Communications' intelligent, software-defined wide area network and connectivity services feature embedded intelligence, enabling the network to “learn” about traffic patterns and usage habits, in order to improve data routing for enhanced application performance. Within the IZO Cloud Ready Network are SD-WAN,

Internet-based WAN, and Hybrid WAN services; as well as connectivity to cloud service providers over Ethernet, MPLS, or public networks.

- **IZO™ Managed Cloud for AWS & Microsoft Azure:** Tata Communications offers managed services for both Amazon Web Services (AWS) and Microsoft Azure Managed services, to help customers design, deploy, migrate data, and integrate big data or SAP applications, as well as public cloud instances, into the overall hybrid IT setting.
- **Managed Security Services:** Tata Communications offers a multi-layered security portfolio that integrates seamlessly with its IZO enablement platform. The security suite includes:
 - Firewall and Unified Threat Management
 - Distributed Denial of Service (DDoS) Mitigation
 - Intrusion Detection and Prevention
 - Firewall Auditing and Optimization
 - Endpoint Protection and Cloud Access Security Broker (CASB)

Cloud Centers and Customer Base

Today, Tata Communications' primary markets are in the Asia Pacific and Middle Eastern regions, with some presence in Europe. While the company does have data centers in the Americas (New York City and Santa Clara, CA), its penetration of that region has been limited, the company reports, due to limited salesforce ability to sell internationally. The company states that it is seeking to increase its North American presence as part of its future plans.

The robustness of the Tata Communications hybrid cloud offer should encourage multi-national businesses from all regions to consider the Tata Communications Services Hybrid Cloud solution for their businesses.

Stratecast The Last Word

As enterprises strive to create a truly seamless hybrid environment, they require a robust management and orchestration platform that enables tight integration between the infrastructures that comprise the holistic IT environment. The integration required to create a seamless hybrid environment is different from the typical IaaS management offered by many cloud providers, so it cannot be assumed that IaaS providers will lead the hybrid cloud race.

While an increasing number of hybrid cloud management platforms offer single-pane access to multiple infrastructures, hypervisors, and operating systems, few are comprehensive in their support. It is even less common to find access integration between the network and infrastructure layers, with consistent security that overlays each; application modernization in the form of container services; as well as managed services for complex workloads, all within the scope of a single platform.

Tata Communications may be considered a dark horse among hybrid cloud providers, but one worthy of consideration by multi-national businesses. Through its IZO™ Cloud Platform, Tata Communications has integrated multiple, popular infrastructures, hypervisors, and operating systems for management into a single, streamlined platform. Within that single view, the company addresses some of the most critical business challenges of the day through integration of services higher up in the stack that offer significant value to business customers. IT departments continue to struggle with managing security, complex workloads such as SAP or big data services, as well as the application modernization process. Tata Communications has streamlined all of these services, making them easily accessible through its IZO™ platform.

Tata Communications' ability to support multi-national enterprises is strong, and the platform they have engineered is more than worthy of consideration by global businesses. The seamless integration of network, infrastructures, and services up the stack creates a hybrid enablement platform that meets enterprise needs.

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