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Cloud Adoption – It's Time to Get Serious

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The COVID-19 pandemic made clear the advantages of truly committing to the cloud and embracing operating as a cloud-based digital-native business. Businesses felt the strains brought on by dramatic unexpected shifts in process patterns and volumes across their entire organizations. Some workloads contracted, while many other workloads expanded dramatically or changed their patterns beyond all projections. Modeling and forecasting became difficult.



Organizations that could theoretically operate remotely or virtually during the pandemic but that were not truly prepared to do so struggled to keep up with a rapidly changing environment. They wasted time reactively implementing traditional IT procedures. Some spent money in a crisis mode to buy data center equipment to grow capabilities.

For example, a certain state unemployment insurance office had resisted shutting down its data centers and moving to a public cloud infrastructure. The sudden huge rush to file unemployment insurance claims overwhelmed its systems. Many people could not get their applications completed. The unemployment office had to order hundreds of physical servers and get them installed and operating to handle the workloads. A few months later, this added capacity was largely idle as crisis workloads peaked. In another example a few weeks into the pandemic, IT staffs forced to work remotely with inadequate management tools were encountering significant obstacles provisioning laptops and supporting work-at-home employees. Windows laptops were in extremely short supply.

The cloud competitive advantage

Organizations that had already adopted a truly software-defined, cloud-based model for infrastructure and operations discovered they were in a much better position. They reaffirmed the competitive advantage of the cloud by being able to shift to a work-from-anywhere model

supported by a cloud-based infrastructure and management tooling that was agile and flexible enough to meet the demands. Cloud service providers and communications service providers (CSPs) proved the model of virtualized software-defined infrastructures and services could keep up with the massive increases in workloads, network traffic, and shifting patterns—on a global scale.

Survival via business transformation

A year ago, a discussion about cloud adoption was very different in tone compared to cloud adoption discussions today. Last year, organizations were picking around the edges of cloud adoption. Many were not fully committed but were instead considering pursuing digital transformation by moving a limited number of specific functions to the cloud or by adding virtualization to their architecture without fully adopting a software-defined way of doing business. Today, it is not about limited digital transformation. It is about survival via business transformation, how to go “all-in” on cloud as quickly as practical.

Business-transformative cloud adoption has several digital transformation components, each with different points of emphasis that vary by industry and application. Each of these digital transformations are worthy of separate in-depth discussions. However, we can summarize the key aspects.

Employee productivity and collaboration

Equipping people with office tools that enhance productivity, automation, collaboration, learning, and communications has been growing in importance for years. The rapid shift towards remote working via virtualized workplaces heightened the need to address how employees work and how products and services are developed, delivered, and serviced. To realize the full potential, the next required step is moving from older on-premises based, licensed versions of office productivity tools to modern workplace, cloud-deployed, subscription-based virtual workplace environments. This next step in cloud adoption provides two critical additional benefits. These including ensuring that the latest modern workplace capabilities are always available for use by employees regardless of physical location and that associated cloud-based modern workplace and software management tools are efficient, secure, and equally agile.

IT systems and operations

As employees shift into a modern digital workplace, IT can become overwhelmed. IT must also shift towards a cloud-based model delivering software-defined services, not hardware-constrained systems. Internally, many on-premises-oriented IT process and systems may become sub-optimal for supporting the modern workplace. They may not provide commensurate software-defined management abilities and become cumbersome to operations.

Licensed on-premises deployed products become obsolete quickly. Given the amount of effort and discrete incremental expense to upgrade, IT often decides to skip refreshes, which results in people not having the latest features to use.

Legacy telecom BSS/OSS face a similar dilemma. Many of these systems were built for an era when voice minutes, text messages, and bandwidth were the primary monetized products delivered over relatively fixed infrastructures.

In the same way that the modern workplace cannot be adequately supported by static on-premises management tools, modern networks of 5G, O-RAN, hybrid mobile edge compute, evolved packet core and the new services they support cannot be adequately managed by legacy BSS/OSS system architectures.

This dilemma is reflected in the telecom industry’s ongoing efforts to move the TM Forum Framework to an Open Digital Architecture (ODA) matched to the agility and elasticity of a global platform cloud or actualization platform.

Platform businesses, networks, cloud and edge

There is a growing need for a common, converged multi-cloud infrastructure. For cloud adoption to reach full potential, a separation of concerns must be maintained between a tenant layer and an actualization platform layer.

The actualization platform is distributed, hybrid, and multi-cloud. It is a networked mesh of hyper-scale compute nodes, smaller edge compute nodes, smaller still mobile edge compute nodes, customer premises edge and IoT devices. A management control plane can be extended across its breadth.

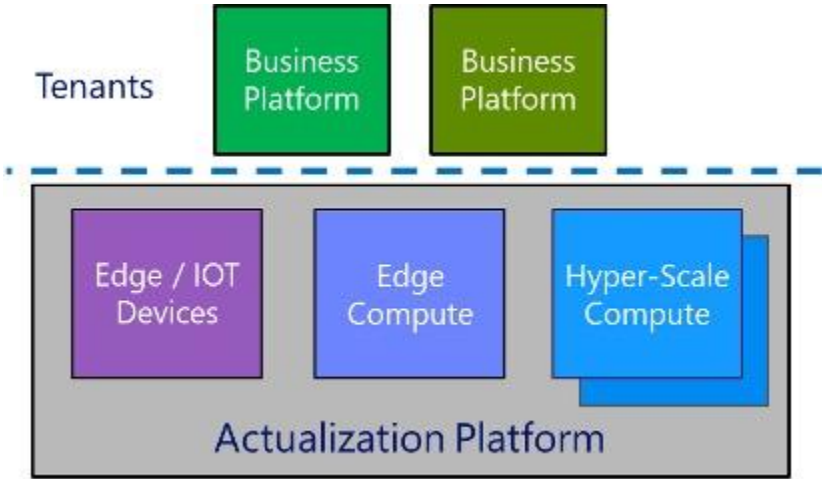


Figure 1: Actualization Platform

Collectively, this enables the cloud, a logical slice of autonomously managed, distributed, load-balanced resources, connected via software defined networking, chained together via orchestration, for a specific purpose and duration.

The actualization platform provides a broad range of first- and third-party, reusable building block capabilities and services, as described in the TM Forum's Digital Services Reference Architecture (DSRA) via marketplaces, stores or libraries such as Github. The actualization platform is converged in the sense it provides enabling capabilities across all workload archetypes:

1. IT, including common functions such as identity, cybersecurity, containerization, automation, etc.
2. IoT-specific infrastructure, features and edge devices
3. Media (edge video processing, media creation and streaming)
4. AI, ML and data management
5. xReality, digital twins, and gaming
6. Network functions, including user plane, control plane, VNF/CNF, and resource orchestration and slicing

A key objective must be to adopt a converged infrastructure capable of predictive, autonomous allocation and deallocation of resources to meet the needs of all six workload archetypes in real time. This need is driven by economics. Eliminating most of the current requirements to have dedicated separate infrastructures in parallel for each of several specific workload types creates a huge opportunity to reduce certain costs in the range of 50 to 80 percent and to increase agility significantly.

Often manageable by AI, service deployment location and resource allocation becomes a runtime decision optimized around configurable key performance metrics such as priority, performance (latency, bandwidth, and so forth), commercial cost, workload balance, and availability.

Tenant business platforms and services

These are hosted across the distributed actualization platform. They are the new focal point for monetization.

Leveraging the building block services available on actualization platforms, developers can create software components, employing DevSecOps delivery pipelines, and orchestrate them together into processes and business platforms. Each service component could be built cloud-natively to run on specific cloud platforms like Azure, AWS, Google Cloud, and IBM as well as employing container technologies.

Workload portability becomes less of an issue if deployed services expose APIs that are accessible by orchestrators to chain together and manage with resource slicing for end-to-end service delivery.

Because they can rely on and trust actualization platforms, developers can focus 90 percent of their activities on optimizing the actual value-add of the business platforms being developed. Business platforms can become easily configurable logical assemblies of component functions and services. This ability to focus on the business problem significantly speeds development and enables a much more effective customer and service management experience.

Examples of tenant business platforms, functions, and applications include:

- TM Forum ODA-based BSS/OSS, VNF/CNF
- Office collaboration and communications tools such as Microsoft 365/Teams, Salesforce, Slack, Zoom, and more
- Modern cloud-based management tools such as Microsoft Autopilot, Intune, Sentinel
- Service orchestrators such as LFN ONAP, Netcracker, Amdocs
- Media creation, processing, and delivery systems, CDN
- Cross-industry and IoT platforms like connected auto, robotic factory, smart city, smart healthcare, enhanced retail, oil, gas, and mining, energy and power, renewables, and water, among others

Business transformation

It is the synergy obtained by embracing all these aspects of digital transformation that ultimately creates the greatest potential value. Cloud adoption permeates across all three digital transformation areas discussed above. However, to achieve maximum economic benefit and optimize the “cloudonomics,” all these areas of cloud-based digital transformation become necessary.

Each provides an important supporting role.

Equipping employees with modern workplace productivity and collaboration tools impacts everything employees do, from creating products and services and writing code to how well employees can understand and support customers.

For the modern workplace to work well and keep up, IT must adopt modern cloud-based management techniques. BSS/OSS must also become as agile as the new 5G enabled connected services they manage. Modern DevSecOps lifecycle management processes become essential.

Finally, the availability of the actualization platform itself provides a robust marketplace of first- and third-party building block services and components. Supporting all six workload archetypes, the actualization platform provides an elastic, converged infrastructure to deploy, orchestrate, and manage complex connected devices, services, and business platforms at global scale securely and efficiently.

Being all-in on the cloud is not just about survival. Ultimately, it is about how to thrive.