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April 24, 2015

How CenturyLink is Setting the Standard for the Next Generation of Cloud Services

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Stratecast Perspectives and Insight for Executives (SPIE)
Volume 15, Number 16

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Introduction[1]

There's a change in the prevailing winds in the cloud market. What was important to enterprise IT leaders at the dawn of the cloud era is giving way to expanded needs and heightened expectations.

Stratecast research shows that cloud adoption soared in 2014, with more than 50% of US-based businesses now using public cloud.[2] To be sure, many users continue to be attracted by the same tactical benefits as in the past: low-cost access to scalable, on-demand infrastructure resources. Nonetheless, the research reveals an increasing percentage of IT leaders are turning to the cloud as part of a broader effort to support strategic business goals. The new IT approach focuses on business outcomes (for example, agility and market responsiveness), with enterprises matching workloads with the most appropriate deployment option and delivery model. To support this new, hybrid IT environment, the cloud service of the future needs to deliver a high degree of functionality, flexibility, interoperability, visibility, and control.

Are providers of cloud infrastructure services prepared for the shift? Cloud service providers of all sizes continue to enhance their basic infrastructure services with greater functionality and value-added services—and yet, it is not clear that their efforts are successfully addressing the needs of enterprises that are still trying to determine how to best leverage the new model.

The result has been market volatility, as many cloud service providers have spent the past few years launching and re-launching their cloud services in the search for a winning strategy. For example, in just the last three years:

- IBM shuttered its homegrown SmartCloud Enterprise platform before centering its cloud strategy on the SoftLayer acquisition.
- Microsoft, which introduced Azure as a Platform as a Service (PaaS) offer, repackaged the product as a public cloud service.
- Verizon ran two legacy cloud platforms (its own and one acquired through hosting leader Terremark), before superseding them with a new Verizon Cloud platform, which the company introduced in 2013, reworked, and re-introduced in 2014.
- AT&T introduced homegrown and partner-based cloud platforms, including Synaptic Cloud Compute and Cloud Architect, before shifting its focus in favor of becoming the network partner to other cloud service providers.
- Dell introduced, and then dropped, its public cloud offer, to pursue a partnership strategy.

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[1] In preparing this report, Stratecast conducted interviews with::

- CenturyLink – Richard Seroter, Director of Product Management, CenturyLink Cloud

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

[2] See SPIE 14-26, *Cloud Adoption Reaches a Long-Awaited Tipping Point – 2014 Cloud User Survey* (July 2014). For information on how to obtain this or any Stratecast or Frost & Sullivan report, contact your account executive or email inquiries@stratecast.com.

Of course, change is to be expected in a rapidly shifting market, and each of these service providers is to be commended for continued efforts to get it right. Nonetheless, Stratecast believes that the dizzying swings in direction reflect industry-wide uncertainty among providers about how the cloud market will evolve. And so, providers are chasing, rather than anticipating, enterprise needs—and thus, are doomed to fall short.

However, one service provider has quietly built a cloud infrastructure service that appears to meet not only the criteria that enterprises are calling for today, but also those that we anticipate to become drivers in the future. Like many other providers, CenturyLink has built its cloud strategy around strategic acquisitions. The difference is how CenturyLink is leveraging, positioning, and building on its acquired assets to create a versatile and enterprise-centric cloud portfolio, backed by one of the most highly functional and comprehensive technology platforms in the industry.

In this SPIE, Stratecast looks at the shift in the cloud winds, and how most cloud services today are at risk of falling short of rising expectations. We examine the CenturyLink cloud strategy, particularly the underlying technology—the CenturyLink platform—in an effort to understand how CenturyLink is positioning itself for the next generation of cloud users.

A New Cloud Dynamic

In the early days of cloud—say, 3 or 4 years ago—the new business model was hailed as a way for resource-strapped IT departments to keep pace with the rush of technology advances demanded by the business. On-demand access to hosted compute and storage capacity provided a budget-friendly, speedy alternative to procuring, installing, and provisioning on-premises infrastructure to support new and expanded workloads.

While such tactical benefits are still important to users, IT leaders are realizing that their responsibility to the business extends well beyond finding a cheap place to host the next application. If CIOs are to lead their businesses into a technology-enabled future, they need to broaden their purview from components, locations, and point solutions to delivery of cohesive, integrated, end-to-end services.

As the role of IT evolves, so do cloud expectations. In a 2011 Frost & Sullivan survey, 46% of US-based IT decision-makers cited "defer server purchases" among their top-three reasons to move to the cloud, followed by "defer/avoid data center expansion" (42%) and "achieve high Return on Investment" (35%). In 2014, the top drivers included "achieve IT flexibility and agility" (cited by 71%); "deliver services and applications faster" (70%); and better support business needs (68%).

Exhibit 1: Top Reasons Enterprises Choose Cloud, 2011 versus 2014

2011	2014
Defer server purchases **46%**	**Achieve IT flexibility and agility** **71%**
Defer/avoid data center expansion **42%**	**Deliver services and applications faster** **70%**
Achieve high return on investment **35%**	**Better support business needs** **68%**

N=400

Source: Frost & Sullivan

The difference in cloud purchasers' mindsets in just three years reflects an important shift in how businesses perceive the role of technology—and how IT leaders understand their own roles. The new IT department is aligned with business goals, rather than departmental goals. The new IT is more proactive and collaborative, service-oriented and outcome-focused, data-driven and accountable. The new IT supports line-of-business (LoB) requirements for functionality, speed, and innovation, while protecting corporate data assets and budgets.

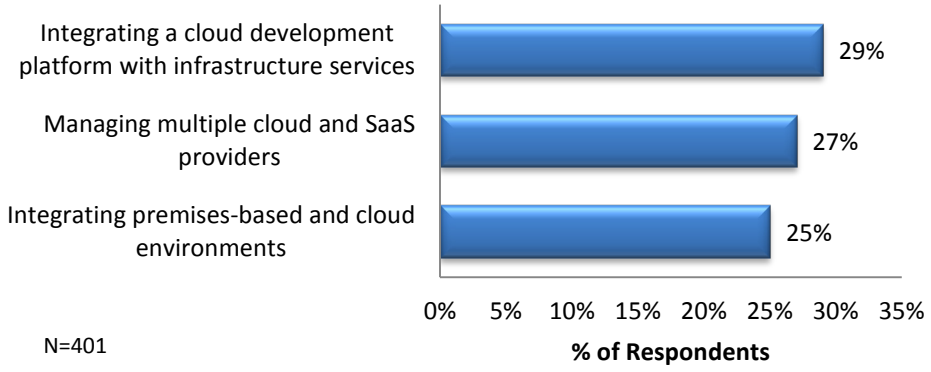
Why the "Old Cloud" Will Not Support the "New IT"

The "old cloud" was perceived as a *place*, a lot like the on-premises data center, but on someone else's premises. And, compared with the hardware-bound premises data center, the original cloud services seemed flexible, fast, and cost-effective. But, as needs have escalated, the old cloud is less and less able to respond. Consider:

Lack of integration hinders efficient operations – The new IT acts as a service broker, considering the requirements for each workload and selecting the optimal deployment model, based on price, performance, and security. To attain the desired cost-efficiency and speed of deployment, IT expects to deploy and manage multiple workloads consistently, using a common orchestration and management platform to support all models. Yet, expectations for this "hybrid cloud" or "hybrid IT" model are rarely met. Many cloud service providers offer true interoperability only across their own cloud services. Others associate the word "hybrid" with the capability for enterprises to connect multiple environments via a public or private network. Service providers nearly always exclude common IT environments, including physical servers, co-location, and managed services, from their management purview, or may provide limited visibility or inconsistent functionality across the various configurations.

For enterprises looking to become more agile and efficient, the lack of integration adds to the administrative burden, and limits the ability to measure and compare operational performance across environments. In the 2014 Frost & Sullivan survey, 72% of respondents said they expect their cloud environment to integrate with their premises-based data center; yet, they are struggling to make that happen: a quarter of cloud users cite such integration as one of their top-three challenges in deploying a cloud. In fact, technical integration and management issues rank among the top challenges respondents have experienced in implementing their cloud strategies, as shown in Exhibit 2.

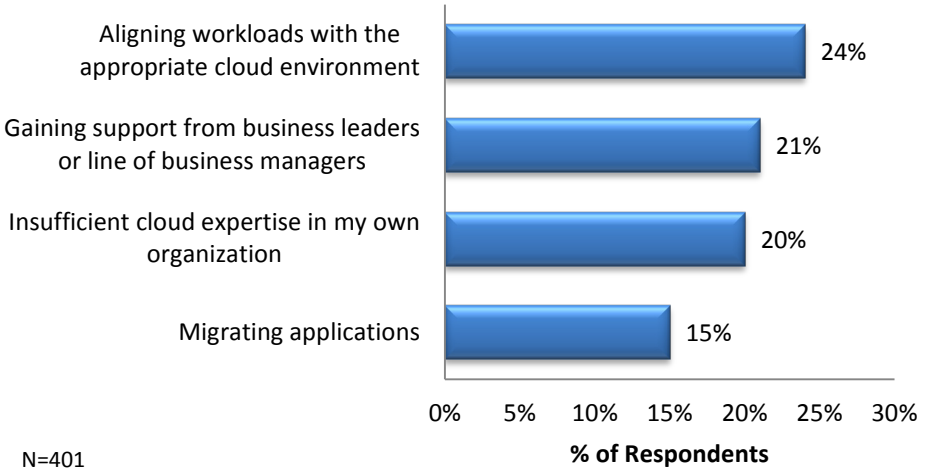
Exhibit 2: Top Challenges Faced by Enterprises in Implementing a Cloud Strategy



Source: Frost & Sullivan

Cloud complexity presents an obstacle to IT transformation – For a model that is praised for its ease-of-use and low barrier to entry, the cloud introduces a surprising amount of complexity. While it may be easy to create a virtual machine (VM), and deploy it in the cloud (so easy, in fact, that non-authorized personnel can do it), IT leaders have discovered that implementing and maintaining an optimal cloud strategy can tax their skills and resources. As shown in Exhibit 3, 20% of IT decision-makers in the 2014 Frost & Sullivan survey cited "insufficient cloud expertise" as a top deterrent, along with struggles with workload assessment and migration. Not surprisingly, some 90% of respondents say they plan to turn to third-party experts for assistance in implementing their IT transformation strategy.

Exhibit 3: Operational and Knowledge Restraints to Implementing a Cloud Strategy



Source: Frost & Sullivan

Furthermore, once deployed, enterprises are finding their cloud environments difficult to maintain optimally. Balancing workload performance and infrastructure resource utilization at an optimal level requires high levels of vigilance and manual intervention, consuming technical resources that are in short supply. In addition, the cloud service provider is often inflexible in how it presents data; for example, metrics associated with performance, cost, and utilization may be available only at the VM level, making it difficult to allocate costs per department, project, or even workload.

Thus, it appears that the old cloud is not sufficiently functional or inclusive, automated or intuitive for the evolving needs of IT. The old cloud takes too much time and manual effort, and yields insufficient data to serve as the cornerstone of the new IT.

CenturyLink Cloud: A New Cloud for the New IT

One service provider, CenturyLink, has developed a cloud service that is flexible enough to support the needs of the next generation of IT. In 2014, CenturyLink introduced the CenturyLink Cloud, a portfolio of cloud services based on a powerful and flexible integrated cloud platform developed by Tier 3, and now known as the CenturyLink platform. In this section, we delve into the differentiators that set CenturyLink's strategy and services apart from other providers, and that position the company for future success.

CenturyLink Cloud Strategy

CenturyLink's cloud strategy stems from a refreshing assumption that the CenturyLink cloud is not the center of a customer's IT universe, nor is any cloud. Instead, CenturyLink expects that enterprises will use its cloud services as a complement to their existing infrastructure, services (including CenturyLink's co-location and managed services), and business processes. This view has driven CenturyLink's investment in its technology platform, which boasts a deeper level of API integration, and greater orchestration across more deployment models, components, and environments than competitors. The strategy also has shaped the platform's functionality, which is designed to serve a broad range of users, including developers, operations and application engineers, line-of-business managers, and financial analysts. Because the underlying technology platform is designed for agile development, CenturyLink can rapidly and cost-effectively evolve its service capabilities to meet changing needs.

Acquisition and Integration Strategy

For over 40 years, CenturyLink and its predecessors have pursued an aggressive acquisition strategy to achieve growth in the network services industry—including the 2010 acquisition of Qwest that positioned the company as the third-largest communication services provider in the United States. The company is taking the same approach in building its cloud presence, making several high-impact acquisitions in the past few years:

- Savvis, the hosting and co-location service provider that was the fourth-largest US cloud IaaS service provider when it was acquired by CenturyLink in 2011.
- AppFog, the Cloud Foundry-based Platform as a Service provider, acquired in 2013.
- Tier 3, an Infrastructure as a Service provider with a well-respected cloud orchestration and management platform, acquired in late 2013.
- DataGardens, longtime CenturyLink partner and provider of Disaster Recovery as a Service, acquired in 2014.
- Cognilytics, provider of predictive analytics software with strong expertise in Hadoop and SAP, acquired in 2014.

The acquisitions are serving CenturyLink's cloud strategy well. The Savvis acquisition brought a network of 58 data centers worldwide, a solid portfolio of co-location and hosting services, and a loyal core of customers. The AppFog acquisition allowed CenturyLink to address the burgeoning interest in Platform as a Service (PaaS). Tier 3 provided the next-generation flexible cloud platform, which is the key market differentiator for CenturyLink's cloud services (as discussed below). The DataGardens and Cognilytics acquisitions support CenturyLink's move up the cloud stack with value-added applications and services.

Following the Tier 3 acquisition, CenturyLink took steps to integrate the services and processes across the different companies—including CenturyLink Network Services, Savvis hosting and co-lo services, and Tier 3 cloud services. To facilitate technical integration, the company reorganized its technical teams around a "DevOps" (Development and Operations) framework for application development and deployment—an approach that streamlines and automates steps in the application lifecycle delivery process. By using DevOps, CenturyLink ensures that updates and enhancements to its technology platform are fast, frequent, low-error, and cost-efficient.

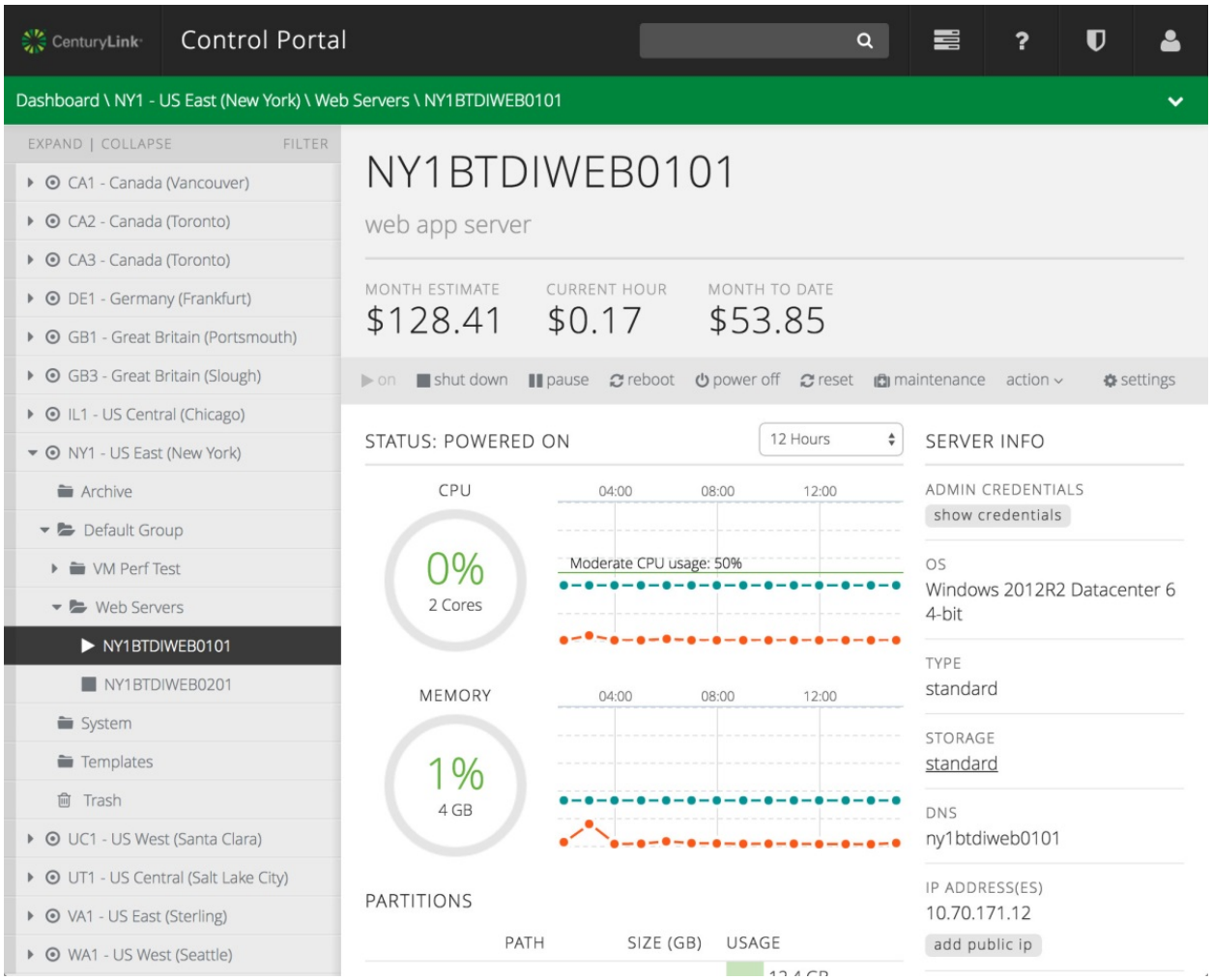
Organizationally, CenturyLink ensured that it had sufficient technical and sales resources in place to support the integrated solution. The company doubled its engineering staff, launching new teams responsible for platform automation, capacity management, analytics, user experience, and customer satisfaction. To facilitate a better understanding of the newly-integrated solution, and deliver a common voice to customers, field sales teams from the different companies were sent to cross-training "boot camps" and monthly "Ask the Expert" sessions.

CenturyLink Platform

The flexible and sophisticated CenturyLink cloud platform is the technology foundation that supports infrastructure provisioning, application management and visibility, and workload orchestration. The platform includes many features and capabilities that address the current and evolving needs of enterprises, including:

- **Automated "Blueprints"** – The more functionality that is automated, the lower the costs to the business, and the greater the control over application consistency, quality, and performance. The CenturyLink platform offers a library of "blueprints"—replicable and customizable templates that automate complex deployments across servers, software, storage, and network infrastructure across environments in the CenturyLink cloud.
- **Vertical and Horizontal Auto-scaling** – All infrastructure components—servers, storage, networks—need to scale together for consistent, high-performance application delivery. CenturyLink supports automated scaling functionality based on user-defined policies. *Vertical scaling* maximizes the amount of processing power available to the application during peak usage. The recently introduced *horizontal auto-scaling* function enables additional VMs to be automatically introduced or removed from a resource pool, as needed. Both capabilities can be easily set up when a VM is deployed, via responses to simple prompts that establish time, performance, and minimum capacity parameters.
- **Developer-rich Capabilities** – Developers represent a sizeable percentage of cloud users, as businesses look to increase speed-to-market of new and enhanced technology. The CenturyLink platform is fully programmable, providing developers the tools they need to build and deploy applications and APIs. By July 2015, CenturyLink says it will introduce an enhanced, platform-integrated version of the AppFog PaaS, called AppFog v2, with integrated identity management functionality.
- **LoB-friendly Interface** – In the future, IT will no longer be the gatekeeper of technology for the business, but the enabler, with more LoB employees taking greater ownership of technology usage. To support this influential user group, CenturyLink has recently re-designed its user interface to be simple enough for non-technical users, as well as technical employees, to access the technology and reports they need. Additional management functions that appeal to LoBs include user-defined subaccounts, which allow departments or workgroups to manage, track, and measure groups of specified VMs.
- **Visibility** – As the IT department embraces its role as a service provider to the business, it requires insight into IT costs and capacity utilization to support smart decision-making. The CenturyLink Cloud Control Portal offers role-based access to granular data regarding costs and infrastructure utilization (see Exhibit 4, below). In addition, the portal offers a cost estimation tool, enabling users to compare "what if" scenarios.

Exhibit 4: CenturyLink Cloud Control Portal



Source: CenturyLink

Stratecast
The Last Word

As noted by a CenturyLink executive, despite the soaring adoption numbers, the cloud market is not yet in its honeymoon phase; instead, it is in the midst of a summer romance, ready to meet the parents and start facing some hard questions. The hard questions will come in the form of enterprise dissatisfaction with cloud services that are inadequate to support their evolving needs, both in breadth (the diversity of environments supported) and in depth (degree of integration, automation, and visibility).

Most cloud service providers are responding to changing needs by trying on and discarding cloud platforms (acquired and home grown), or by bolting on APIs in which the interface seems to be just skin-deep.

In contrast, CenturyLink has leveraged its acquisitions into a portfolio of truly integrated cloud services, supported by one of the most sophisticated and flexible cloud platforms in the industry. Platform CenturyLink is designed to support management and orchestration capabilities up the cloud stack (IaaS, PaaS, and even some commercial SaaS), as well as across various deployment models and environments (CenturyLink's own portfolio of cloud, co-lo, network, and managed services), with additional APIs planned to extend functionality to physical server deployments and even other vendors' clouds.

CenturyLink's cloud addresses the needs of the next generation of technical and LoB cloud users for highly automated, efficient, reliable, and flexible IT resources. At the same time, it addresses the needs of today's IT departments, as they transition to the cloud—enabling them to maintain current IT environments as part of their new cloud, and even providing training and onboarding assistance.

Stratecast believes that CenturyLink's cloud strategy and services, and most particularly its technology platform, have combined to deliver a unique and high-quality cloud service suitable for the "new IT." Competitors should take notice.

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