By supporting a hybrid network, IT departments can become better strategic partners to the businesses and customers they support.
There's a perception of cloud computing and enterprise networks as being separate areas requiring separate competencies.

In reality, the cloud is converging into the enterprise network, and networks are converging with the cloud. The two areas have more in common than ever before, including automation, virtualization, data security, and disaster recovery capabilities. Even as some IT resources are moving quickly into the cloud, other resources are moving just as quickly onto enterprise networks.

The convergence between the cloud and the network opens up a new approach to enterprise computing: hybrid networking. Hybrid networking is not an “either/or” question, but rather a comprehensive approach that evaluates business requirements for specific IT workloads, applications, and data to determine the optimal networks, whether cloud, enterprise, or both.

The cloud offers enormous potential for the modern enterprise. Indeed, cloud computing is an essential component of some of the most influential and talked-about technologies of recent years: BYOD for mobile accessibility, big data for advanced analytics, disaster recovery, and the Internet of Things. All of these technologies rely on highly scalable infrastructures that can be accessed on demand, at low cost, and with minimal setup.

Overall, the technology industry has been delivering on cloud computing’s promise. Cloud capabilities are becoming more extensive, covering a wider range of environments and applications. Cloud-based solutions can integrate into existing business applications, whether as industry-specific vertical applications or as broader horizontal capabilities. In just about any industry, you can find anything-as-a-service up and down the stack. Networks are no exception. We call it the “cloudification” of network services. The evolution and influence of cloud technology have moved network devices and applications into the cloud. The functional capabilities that were previously tied to a physical appliance on a wide area network are increasingly being extracted from hardware and moved directly into the network itself using technologies such as software-defined networking (SDN) and network function virtualization (NFV).

Software-defined enterprise networks change the business model for running enterprise IT. Historically, physical infrastructure for networking services such as network-based security and DDoS mitigation required significant capital expenditures, along with ongoing operating expenses. These deployments also came with costly management overhead for the physical procurement, installation, and integration of the devices, as well as complex project management over extended timelines. Given the time and effort required, this approach was hardly agile enough to keep up with the speed of cloud within the data center.

Today’s enterprise networks are becoming much more dynamic.

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Leading network providers are extending the on-demand nature of cloud purchasing to include network-based services. Businesses can add features on-demand, without needing to purchase and install dedicated appliances. Network devices, rather than just being connected to the network, can be run entirely on the network.

The move toward hybrid IT environments also includes extending cloud-based network connectivity to collocated facilities and on-premises data centers. With this approach, modern enterprises can take greater control of their existing IT systems by including them in a single, powerful hybrid network.

**The Pressure to Be Agile**
Pressure in the marketplace to deliver new capabilities is driving the need for business agility. Across multiple industries, nimble and well-capitalized startups are going to market with innovative new approaches to business. Larger enterprises are also making big bets on new technology. As a result, business leaders seek to be empowered to incorporate new technology into existing business processes.

Facing such competitive forces, decision-makers are moving quickly. It used to be that when employees wanted additional capabilities, they would requisition hardware and software from a centralized IT department. Now, they’re heading straight to the cloud for what they need, going outside the constraint of limited IT budgets and resources and moving toward managed services for the management of common business applications and infrastructure.

For the simplest cloud-based applications, all it takes is an empowered business user to open an account and start working. Other cloud applications operate through open APIs, many of which can be accessed by an IT professional embedded within the business. Complex applications still require

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comprehensive implementation support from a combination of vendor resources and in-house IT staff, but even these types of applications are becoming increasingly turnkey.

This new approach to IT procurement makes enterprise network management even more important. For the latest generation of applications and services, the network is the backbone of the infrastructure. As a result, networking teams are partnering with other IT teams to ensure the best utilization of bandwidth and other resources.

**How Hybrid Networks Are Changing IT Management**

The diffusion of IT workloads into the cloud has added a new layer of complexity to network management. In the past, network infrastructure was rolled out to support specific workloads. Now, the network has to discover when new workloads are spun up as on-demand cloud instances and connect them to existing resources.

IT workloads running in separate environments rely on different routing strategies, IP addressing schemes, quality-of-service guarantees, and security protocols. Although the largest cloud providers now offer direct connection capabilities with preprovisioned network capabilities, this solves only part of the problem. For the needs of an enterprise, this may not be sufficient.

Optimum performance, security, and reliability require a tight integration between the infrastructure provider and the network provider.

There are many questions to be answered for each cloud connection. For example, if an enterprise seeks to connect an MPLS network to Amazon Web Services or Microsoft Azure, how does it configure the direct connection? What’s the routing strategy? Which IP addressing scheme should it use? Are the cloud resources considered inside or outside the firewall? Who is responsible for the end-to-end solution—the cloud provider, the network provider, or the enterprise?

Someone needs to configure the parameters of the network interface to cloud resources, and there are serious ramifications if these parameters are configured incorrectly. The network is a critical element of performance and security, and the enterprise is ultimately responsible to its stakeholders for any issues that arise, whether it’s deterioration of quality of service to the end customer or vulnerability to data breaches.

Bottom line: What looks easy on a whiteboard can become difficult in real-world conditions.

**Applications Have Moved to the Cloud and to Networks**

In the past, enterprise IT buyers had to choose between outsourced services and in-house software installations.

Modern enterprises using hybrid networks
Today’s applications are built and engineered to run in the cloud. As a result, the decision between private cloud and public cloud is less about the economics of the two options, as they’re both relatively inexpensive and easy to deploy. Instead, it comes down to operational questions involving capacity, security, and data custody.

For example, if a customer-facing application uses the public Internet, those services are delivered using best efforts. The network providers will do their best to deliver information, but there are no guarantees. But if you’re an online retailer, you can’t afford to have a slow website on Black Friday or Cyber Monday. That’s why, for something like a customer service application or a shopping cart, private cloud has definitive advantages.

Similarly, private cloud also provides greater assurances in terms of the IT security perimeter. While public cloud providers have gotten much better at addressing security and data custody concerns, they haven’t thought of everything. Problems can arise even when using SSL encryption at the application level, with resources accessed through an IPsec tunnel. No matter what the specs say, it takes a network specialist to think through the entire range of scenarios specific to a business.

And if you miss something, your company may be subject to compliance-related liabilities and loss of customer trust. In highly regulated industries such as healthcare, financial services, retail, and government, data custody is a core concern and security is a major limiting factor. These are critical for any online merchant that has to comply with PCI security standards.

Five Benefits of Hybrid IT Networks

The ideal state of the hybrid network offers several key benefits to business units, individual users, and the enterprise as a whole. With a hybrid IT network, IT departments can:

1. **Automate access to cloud services.** Dynamic workflows belong in cloud resources that can handle large spikes in traffic. Furthermore, businesses need to be able to requisition these cloud resources quickly and efficiently. That’s to say, it’s not “dynamic” if you have to wait six months for resource approval.

2. **Retain low-cost workflows on-premises.** Often, it makes perfect sense to retain relatively static workflows on low-cost, on-premises data centers using commodity hardware. If it ain’t broke, don’t fix it. The hybrid approach allows IT departments to keep their focus on innovation, without having to spend time migrating low-value applications to the cloud for minimal benefit.

3. **Integrate IT workloads into a single security perimeter.** By incorporating cloud workflows into the same security framework as on-premises workflows, enterprises can better protect themselves against vulnerabilities and breaches. It’s also easier to demonstrate compliance to regulators and auditors when there’s a single, consistent, overriding security framework.

4. **Reduce IT spending.** By squarely addressing the security and operational concerns involved with cloud, the net result should be an increased willingness for the enterprise to give the green light to new cloud-based initiatives. In turn, this adoption of new technology will allow companies to free up capital previously dedicated to building and maintaining massive data centers.

5. **Free up IT innovation.** Streamlined access to cloud-based resources can help the IT department deliver higher-value solutions to the business, taking advantage of the incredible innovation happening with services available on cloud platforms.
Move Fast Without Breaking Things

Here’s what a well-functioning hybrid network looks like:

- Cloud resources are directly connected to enterprise networks, with workloads on Microsoft Azure, Amazon Web Services, or CenturyLink Cloud seen as nodes on your existing MPLS network.
- Business users follow your internal company network protocols and practices instead of having to adapt to those of the external cloud providers.
- The public Internet is reserved for public-facing business processes. All other workflows, including back-end support for public-facing processes, are managed separately on more secure private networks.
- New cloud resources are provisioned through a streamlined, prebuilt interface, ensuring compliance with enterprise network protocols and practices.
- Virtual administration of network management occurs across both cloud and enterprise networks, with the ability to add, remove, and configure services with equally high responsiveness across both network and cloud resources.

That’s a powerful vision for hybrid networking.

Best of all, it’s not difficult. Advances in network technologies such as SDN and NFV make it easy for IT and network administrators to manage the full capabilities enabled by hybrid networks.

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However, it’s difficult for most businesses to justify staffing up and training to support multi-environment networking. From the perspective of the business, networks are often considered “important” but not “strategic,” as few companies have the ability to market themselves on the basis of being competent IT network specialists. If you’re a content provider, you need a best-in-class network to keep your customers happy. Yet in other industries, a high-performing network is becoming a competitive differentiator as more services move online and customers become more digitally savvy.

That’s why the best way forward is to partner with a specialist. To make the transition to hybrid IT networks spanning on-premises and cloud offerings, the smart choice is to find a partner with expertise in the fundamentals of hybrid network design and experience in implementation and management in the hybrid enterprise.

By supporting a hybrid network, IT departments can become better strategic partners to the businesses and customers they support.

**CenturyLink** assists IT departments in making the transition to a hybrid network that encompasses workflows across environments. CenturyLink offers a partnership-based approach to network expansion, with expert teams of network sales engineers and network operations engineers who can architect the appropriate network for your business and then help build it, put it into place, and manage it end to end.

CenturyLink offers converged data, voice, and video on MPLS, accessible via VPN; private line services; and Internet bandwidth. For more information on how CenturyLink can help your organization deploy a hybrid IT network, please visit [http://www.centurylink.com/business/enterprise/services/data-network/mpls-vpn.html](http://www.centurylink.com/business/enterprise/services/data-network/mpls-vpn.html).

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