IDC WORKBOOK

Network-Enabled Cloud: Key Considerations and Partner Selection Criteria

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Adapted from *U.S. Hosting Infrastructure Services 2013–2017 Forecast* by Melanie Posey, IDC #240897 and *2012 U.S. WAN Manager Survey: Hosting Infrastructure Services* by Melanie Posey, IDC #241042

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Introduction

Enterprise datacenters are no longer the sole conduits for critical business applications, content, and processes. Increasingly, companies are exploring an ever-expanding array of external public cloud options for compute/storage resources, application development platforms, and business applications. IDC predicts that more than 80% of new applications will be deployed or distributed via the cloud and that cloud platforms will gradually displace the client/server approach as the dominant model for application and solution delivery.

Companies are also taking advantage of elastic provisioning, which accelerates process and product implementation, as well as refocusing IT resources on more strategic application-oriented projects and on-demand business agility for faster development and moves/adds/changes. While cloud services expand the reach and scale of the extended enterprise, they also create challenges for network/IT managers who must serve the "dynamic IT" requirements of internal constituents (developers and line-of-business personnel) as well as those of customers and partners that rely on corporate systems. Enterprise end users typically access public clouds via the public Internet or IPSec tunnels, which introduces latency, results in inconsistent network performance, and opens the network to potential distributed denial-of-service (DDoS) attacks and malware.

Network-enabled cloud (NEC), which combines the control, protection, and performance advantages of a private cloud with the economies and elasticity of a public cloud, seamlessly integrates corporate VPNs with cloud-based resources, making it possible for enterprise end users to flexibly scale resources that reside outside the enterprise in an optimized, secure fashion. NEC facilitates the bridging of inside and outside environments without exposing mission-critical data to the public Internet or sacrificing application security and performance. NEC-based "on net" clouds open up the possibility of using external clouds to run a broader range of applications and workloads in an enterprisewide manner because cloud resources are provisioned on and distributed through the enterprise network.

By extending the embedded security and access authentication functions of enterprise WANs into cloud architectures, businesses can start thinking beyond the traditional IT approach of enterprise datacenters, hardware procurement, and up-front capital expenditure. Scalable, externally sourced IT resources allow forward-thinking companies to leverage the cloud for business velocity. The improved agility and flexibility of integrated cloud-network infrastructure provide a platform for transformation in the form of new business models, more rapid responses to changing market conditions and customer preferences, and greater leverage of Big Data to drive business decisions, product development, and customer experience improvements.

Improving Cloud Application Performance Using MPLS VPN Connectivity

The core benefits of NEC are best leveraged through the extension and integration of MPLS VPN technologies into public cloud platforms and services. Quality-of-service (QoS) routing, class-of-service (CoS) designations, traffic management functions, and embedded security are key features of MPLS VPNs. Unlike standard cloud connectivity via the public Internet or IPSec tunnels, MPLS VPN–based access supports "four-nines" availability, provides performance guarantees around latency and packet loss, and enables direct routing from corporate locations to the offsite cloud resource pool. This type of optimized cloud connectivity mitigates performance concerns by ensuring consistent application performance from any VPN-connected location or endpoint, including devices used for next-generation mobile applications.

Furthermore, NEC facilitates greater orchestration between external cloud resources and the wide area network. As a result of this tighter alignment, scalable resource provisioning covers the cloud compute *and* network layers, enabling end-to-end dynamic, elastic flexing of the entire cloud stack to meet the changing resource requirements of cloud workloads and applications.

Key use cases for the type of integrated cloud-network scaling facilitated by NEC are as follows:

- Retailers that need additional compute capacity and in-bound network bandwidth to handle increased traffic resulting from promotions, social media–generated spikes in interest, and holiday shopping (Christmas, Valentine's Day, Mother's Day, etc.)
- Entertainment and news organizations that face the challenge of even more volatile capacity requirements due to unpredictable demand
- Corporate VPNs, where businesses require the ability to handle seasonal compute and network requirements driven by events such as open enrollment for benefits programs

In each of these cases, the network's ability to dynamically adjust to the changing load on the compute layer ensures continuous, reliable delivery of applications, content, and business processes to external and internal end users.

Implications and Benefits of NEC Connectivity

Today, large and small companies face globalization; the increasingly distributed nature of production, operations, marketing, and sales; and the "new normal" of "anytime, anywhere" access to applications, business processes, and content. This means that companies must become more flexible, agile, and innovative. They must optimize their supply chains, sales/marketing, service processes, business decision frameworks, and customer care organizations to rapidly develop new products and services, reach new markets, implement fine-tuned customer segmentation strategies, and deliver customer satisfaction.

The growing complexity of business process ecosystems requires a holistic framework-oriented approach to provide the performance, resiliency, and security needed to drive end-user productivity, achieve cost/operational efficiency, and deliver improved revenue generation for the enterprise. This has given rise to new "born in the cloud" companies such as Amazon, Netflix, and salesforce.com that can be more nimble and flexible because they are unburdened by legacy systems and processes.

Established, traditional businesses are getting into the act as well and are increasingly migrating to the cloud external-facing workloads such as ecommerce and customer care as well as mission-critical internal applications such as customer relationship management (CRM), decision support, and enterprise resource planning (ERP). For these internal workloads, NEC gives enterprises the confidence to use cloud by addressing security, application performance, reliability, and workload migration concerns.

Enterprises that leverage the agility, flexibility, and cost benefits of the cloud for mission-critical business applications such as ERP, CRM, supply chain management, and sales force automation will reap substantial rewards from network-enabled cloud. When third-party cloud infrastructure is positioned as an extension of a private corporate network, the same types of mission-critical transaction-oriented and latency-sensitive workloads running on servers in enterprise datacenters can be hosted in the cloud and securely distributed among various endpoints, including branch offices, partner locations, and customer sites. NEC provides an integrated, best-of-both-worlds solution for enterprises that until now have not tapped into the agility, cost, and elasticity benefits of public clouds.

NEC can also facilitate new approaches to business by enabling data to be shared more easily among applications and across the organization, thus enabling Big Data–driven insights to be channeled into development, sales, marketing, and customer engagement strategies. Furthermore, cloud-based business systems can leverage Big Data applications to collect and analyze information from connected devices (e.g., smart TVs, medical devices, fleet management systems) and mobile/wireless devices (e.g., smartphones, tablets, portable game consoles, GPS devices).

With this information, companies can collect data about customer (or asset) location, behavior, and level of engagement to drive strategy and planning, as well as push information from the cloud back down to the end user or device for servicing, recommendations, or purchases. NEC not only supports the tandem scaling of compute and network resources but also eliminates the risk of exposing critical business systems and information to Internet-facing attacks by routing data over private corporate networks.

Adopting NEC Connectivity

Network-enabled clouds empower enterprises to change the way they think about their IT architectures and develop new application delivery strategies that more effectively meet the needs of internal and external customers without sacrificing control, security, or performance of mission-critical workloads.

However, not every cloud service provider (CSP) is positioned to offer the appropriate level of integration. The ideal CSP should have experience, expertise, and enterprise-grade solutions in the networking and cloud infrastructure domains. While many cloud IaaS providers have compute, storage, and datacenter networking capabilities, few also have the enterprise networking skills and WAN capabilities to be considered a network-enabled cloud partner.

When an enterprise is evaluating a network-enabled cloud partner, one of the first places to look is the existing WAN provider. Enterprises must look for the following when considering a network-enabled cloud partner:

- A broad range of offerings covering many networks and IT needs and supporting multiple delivery options (Key elements of a full-service network-IT portfolio include traditional hosting/IT outsourcing solutions, communications and collaboration services, and managed security solutions.)
- Service-level agreements (SLAs) specifically built for enterprise-class operations and mission-critical applications that guarantee not just availability but also performance, latency, and even application-/transaction-level service assurance
- Network and datacenter footprints that ensure on-net resources are available in the primary locations where business operations are performed
- An ability to securely connect to other clouds (both enterprise and service provider) using APIs that seamlessly federate the cloud resources inside and outside the corporate network
- Support for standard enterprise applications such as ERP and CRM, as well as next-generation ecommerce, social, mobile, and analytics applications and internally developed or customized applications

- WAN optimization/acceleration that enables network-connected systems to run business operations
- An ecosystem of partners that can expand the functionality of hybrid network-enabled cloud architectures and layer capabilities on top of on-net clouds

Assessing a Network-Enabled Cloud Provider

The following worksheets will enable organizations to prepare for network-enabled cloud implementation (see Table 1) and provide evaluation criteria for vetting prospective partners (see Table 2).

These checklists are designed to serve as the basis from which to begin internal discussions on the network-enabled cloud implementation process and to establish the partner capabilities and attributes required for a successful journey to the network-enabled cloud.

Table 1

Questions Organizations Should Ask Themselves Prior to Implementing Network-Enabled Cloud

1. Do you have an MPLS VPN network?	
If not, would having all your applications in a private network be advantageous?	
2. Which applications/workloads are being considered for cloud delivery?	
What factors make cloud an attractive technology solution (e.g., operational costs, cycle time, flexible scaling, remote/mobile worker support and access, reach new markets, manage growth)?	
3. What are the network requirements of the applications and workloads being considered for cloud migration?	
Consider the latency-sensitivity of transactional and communications-oriented apps and workloads being moved to the cloud.	
4. Where are the key end users of cloud-delivered applications — in fixed locations or on mobile devices?	
Take into account the extent to which your end users are geographically distributed to determine the importance of advanced network capabilities for your cloud deployment.	
5. What are the security requirements of your cloud-based applications?	
Considerations include compliance regimes for regulated data, encryption requirements for data in transit and at rest, and end-user authentication.	

6. What are the reliability requirements of your applications?	
Is your application an ecommerce order platform or customer care engine that must be "always on" to serve a global base of customers or partners?	
7. What are the performance requirements of your applications?	
Business applications such as financial and point-of-sale transactions and real-time communications applications such as voice over IP and videoconferencing require consistent, predictable performance. How much (if any) variability is acceptable for various applications?	
8. What are the various dependencies of the cloud-deployed applications/workloads?	
What physical and logical distances are involved in the data and application components used by the workloads and business functions being implemented in the cloud? Absolute latency and variations in latency can adversely impact cloud performance.	
9. What is the ideal architecture for your cloud deployment? On-premises or offsite, or both? Public, private, or hybrid, or all of the above?	
10. What is the anticipated transaction and/or data transfer volume of your cloud-delivered applications and workloads?	
Think about whether your existing compute, storage, and network assets and internal expertise can keep up with growing requirements.	
11. Do you have applications in development that need a seamless production environment to grow into?	
12. Do you have applications with unpredictable demand that require scalability and predictability?	
13. Do you have seasonal/peak periods in your business where you anticipate workload spikes?	
14. Do you have other high-value projects that you could have your IT staff focused on if you significantly reduced the time spent on maintenance?	

Source: IDC, 2013

Table 2

Evaluating a Network-Enabled Cloud Provider

1. What are your history and track record of providing cloud, network, *and* network-enabled cloud services?	
What specific experience of providing solutions to companies in my industry can you cite?	
2. How will your offerings help my organization reap the benefits of cloud and become more flexible and agile in the face of changing business dynamics?	
3. What is the long-term vision for your network-enabled cloud offering?	
Factors to consider include API development, hypervisor support, global coverage, and hybrid cloud support.	
4. How do your SLAs support enterprise-level, mission-critical workloads?	
Do the SLAs simply guarantee availability and uptime, or do they also involve overall application/workload performance, including transaction-level assurance?	
5. What continuity/failover solutions are available?	
Ask that the service provider describe the failover features built into the NEC solution, including offsite backups, network/datacenter diversity, and infrastructure redundancy. Also discuss disaster recovery planning and implementation processes.	
6. How will your cloud offering ensure network and data security?	
Describe your practices for datacenter, connectivity, and hardware security, as well as end-user authentication.	
7. How broad is your offer portfolio, and what complementary services can you provide to support extended enterprise requirements?	
Consider the provider's partner ecosystem as an extension of its portfolio that offers an augmented ability to meet customers' business needs (e.g., migration, development of cloud strategy).	

Source: IDC, 2013