White Paper

Converged Network-IT Services

Part 2: Eight Rules for Building an Integrated Network-IT Service Production Portfolio Strategy

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Converged network-IT services is a broad topic. To help service providers (SPs) understand how to increase competitiveness by developing a network-IT service portfolio production strategy, the Cisco® Internet Business Solutions Group (IBSG) has created two white papers. Part 1, titled "Converged Network-IT Services Part 1: A Service Portfolio Production Strategy To Increase Service Provider Competitiveness," describes the nature of the market opportunity, the ideal solutions portfolio, service production mechanisms, and how service providers are responding today. Part 2 (this paper) defines eight rules that service providers can follow to address key issues in the emerging market for network-IT services.

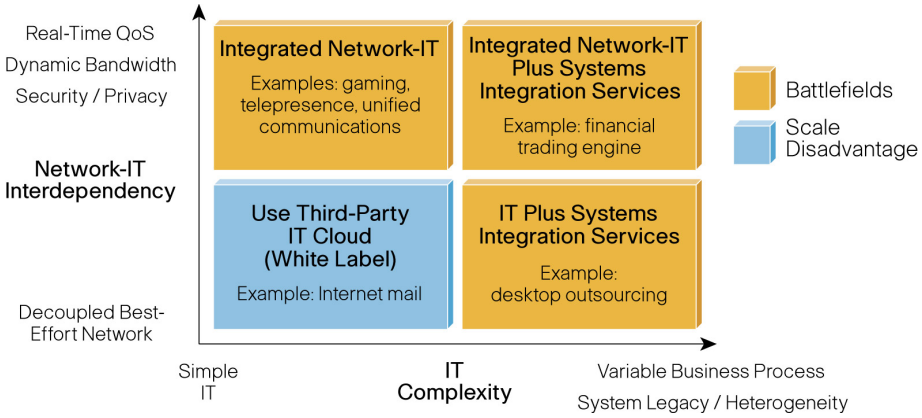
Introduction

As established in part one[1] of this two-part "Converged Network-IT Services" series, SPs are transforming their business models to become providers of integrated network-IT services. Their goal is to offset flattening revenues by further penetrating the burgeoning market for services such as IPTV, emerging forms of consumer telepresence, and cloud computing.

To better understand the underlying dynamics of this transformation, Cisco IBSG interviewed 15 executives from leading SPs in Europe and the United States. The goal of these interviews was to understand and highlight the broad range of challenges and opportunities SPs face with regards to integrating network and IT service production capabilities.

The results, covered in part 1, concluded that in response to competitive pressures, SPs must embrace a segmented production strategy that takes advantage of their unique capabilities, especially with regards to control over the end-to-end network and IT assets (see Figure 1). Service providers also need to consider a portfolio of integrated services by structuring their offerings according to network and IT complexity, and by relying on an "external cloud" for some service elements.

Figure 1. Four Delivery Models Address Varying Complexity Trade-Offs Between Network and IT Capabilities



Source: Cisco IBSG, 2009

Eight Rules for Developing an Integrated Network-IT Strategy

Clearly, a key challenge for SPs is to determine the best way to orchestrate the underlying capabilities of network-IT service production. To assist with this process, Cisco IBSG defined eight rules—four to create a converged service production strategy, and four to ensure a successful business transformation during the implementation process.

Strategy Rules

1. Differentiate your business by establishing end-to-end network and IT control with on-demand provisioning and operation of resources across network and IT domains.
2. Build enterprise IT capabilities to migrate complex applications.
3. Integrate third-party Software-as-a-Service (SaaS) offerings and premium communications features to move beyond reseller margins by bundling services into compelling offerings.
4. Strengthen your business case by understanding where you can be competitive, prioritizing the correct elements of the network-IT service portfolio.

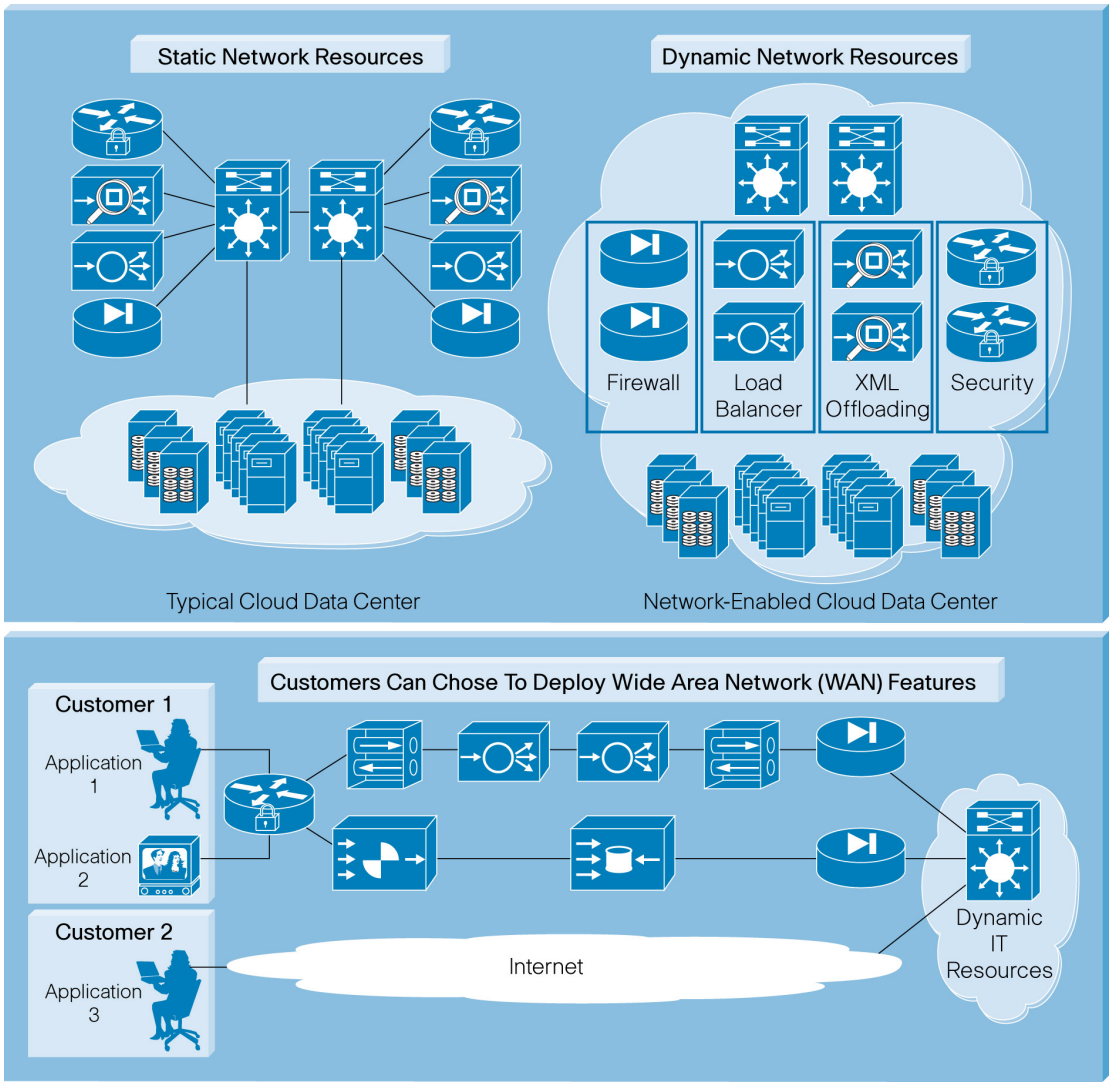
Implementation Rules

1. Deploy an operating model that enables change and reduces costs by using an agile business architecture[2] to balance modularity and end-to-end control.
2. Define network application programming interfaces (APIs) that balance functionality and simplicity.
3. Virtualize and automate IT service production capabilities and SP applications by enabling scale and return on investment (ROI) in hybrid environments.
4. Build a lightweight umbrella management capability across network and IT domains, without relying on integrated management.

Strategy Rule 1—Differentiate Your Business by Establishing End-to-End Network and IT Control

Today's over-the-top (OTT), network-independent cloud platforms provide computing, storage, and application resources dynamically on demand. Associated network resources, however, are provisioned on a static, best-effort basis that causes a lack of cohesion with application requirements. This means customers cannot control or monitor available network resources to run their applications successfully, both within the cloud data center and between the data center and customer premises (see Figure 2).

Figure 2. Dynamic Network Components Enable SPs To Differentiate in the Data Center (top) and Extend the Cloud to Customers' Premises (bottom)



Sources: "Network-Enabled Cisco-Powered Cloud," Masum Z. Hasan, Monique J. Morrow, Glenn Dasmalchi, Andrea Baldini, Geng Lin, Rodolfo Milito, and Pere Monclus, 2009; Cisco IBSG, 2009

This creates a significant opportunity for traditional network-based SPs to differentiate themselves by adding on-demand network features to their offerings. By delivering features and service-level agreements (SLAs) related to performance, availability, and security, these on-demand offerings can better satisfy the stringent requirements of business applications and multimedia solutions.

Within the data center, SPs need to operate standard network components including switches, firewalls, load balancers, and application accelerators as virtual, on-demand resources in a multitenant environment. By doing so, network bandwidth and latency can be guaranteed dynamically and provisioned on an on-demand basis to customers' virtual machines and applications. Moreover, policies regarding security and privacy can be approached in a similar manner and moved with applications, independent of physical resource constraints.

With regards to the wide area network (WAN), today's cloud solutions use the Internet, combined with content delivery networks (CDNs), to deliver customer data to the cloud. This type of delivery mechanism may not be appropriate for some applications due to concerns about security, privacy, and regulations. In these instances, customers may want a "virtual private cloud" (VPC) solution that combines existing private network or virtual private network (VPN) solutions with additional IT functionality. In addition, customers may have concerns about application response times, media streaming performance, and reliability, causing them to look for quality of service (QoS) guarantees and performance SLAs that span the data center and the WAN.

To address this opportunity, SPs that own their own networks can implement on-demand provisioning of data center and WAN elements in concert with dynamic computing and application resources. By doing so, they can dynamically provide bandwidth, VPN services, and guaranteed uptime to customers' premises. This, in turn, enables automated and self-service configuration of service levels at the application level.

> "End-to-end control of services across network and IT [domains] is a key differentiator against cloud-based services."
>
> Cisco IBSG Interview Respondent

When Verizon Business announced its on-demand computing and storage services, company executives were unequivocal about competitive differentiation. In fact, one executive commented, "Amazon doesn't own the WAN infrastructure, so it has no visibility into the network and thus can't deliver SLAs. It's not enterprise-ready."

Strategy Rule 2—Build Enterprise IT Capabilities To Migrate Complex Business Applications

Enterprise application environments are complex. Legacy applications often have old or even unknown version numbers and sometimes run on outdated servers. In addition, server farms can include a mix of systems that run diverse operating systems and various runtime environments, while applications are closely intertwined with the underlying infrastructure and supported business processes. In these types of environments, the real difficulty is the lengthy migration process to the cloud.

Addressing this challenge requires enterprise IT skills to target and migrate complex application environments. Clearly, this is not an area of strength for SPs. Even so, OTT players mostly lack this capability. Given this situation, SPs can deliver professional services to help enterprises migrate business applications to flexible platforms. To do so successfully, a deep understanding of business processes and systems integration is required. To further differentiate themselves from OTT players, SPs should consider building a dynamic platform that supports heterogeneous server environments.

In addition to the challenges of legacy applications and migration complexity, large businesses are concerned about the privacy and security of multitenant platforms. To help enterprises address this, SPs can obtain external security certificates such as SOX SAS70 Type II and BS7799 for their platforms. At the application level, SPs can reach beyond the standard SaaS model and deliver license-based applications like SAP and Siebel, and provide them as a package with on-demand network and computing elements.

"If you don't have multiple platform support, you're not in this business."

Dr. Gregory Smith
Director, Dynamic Services, T-Systems, VMworld 2007

The recent wave of systems integrator acquisitions by SPs highlights the importance of having enterprise IT capabilities.[3] For SPs that do not yet have these capabilities, Cisco IBSG believes acquisitions and partnerships are good approaches as long as they are well thought out and stay focused on the SP's core business. Once an acquisition has been completed, value creation clearly relies on developing a seamless operating model. Time is critical since OTTs are also striving to build these capabilities and are starting from a lower cost basis.

Strategy Rule 3—Integrate Third-Party SaaS and Premium Communications Features

The SaaS market is growing rapidly. Forecasts vary greatly, but it is generally agreed that SaaS revenues will become 10 percent to 35 percent of the total software market by 2011.[4] With limited skills in software development and a footprint that covers only a fraction of the global software market, SPs will find it hard to develop standard horizontal and segment-specific SaaS solutions in-house. Simply reselling and hosting SaaS solutions is troublesome as well. Resellers can expect to find a low-margin market and pressure from value-added resellers (VARs) that protect their own small to medium-sized enterprise (SME) revenues.

Service providers need to create sustainable differentiation to avoid becoming commoditized, low-margin resellers. Providing one-stop-shop solutions to the SME market by integrating applications with network-centric services is one way service providers can achieve this differentiation.[5] Service providers can accomplish this by:

- Bundling existing SaaS applications with premium communications features and delivering them to multiple endpoints, including mobile devices, PCs, and fixed-line phones
- Providing integrated contact lists, calendaring, messaging, and communications features
- Offering one bill for Internet access, communications, and applications (provided regulators agree)

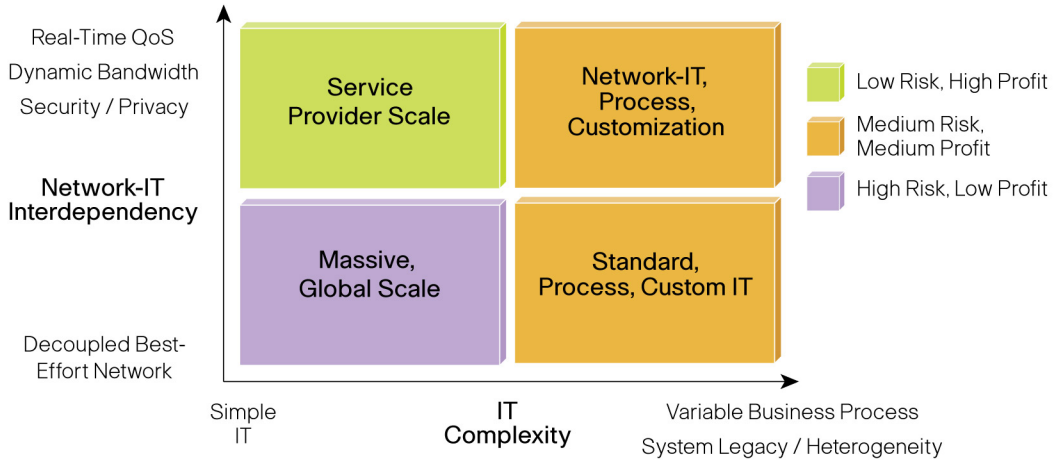
As an example, Telstra, Australia's leading telecommunications and information services company, launched the beta version of its T-Suite platform in 2008. The service aims to deepen relationships with SMEs by offering convenient access to a trusted set of applications with integrated value-added services for common messaging, identity, and security. Since its initial bugs and performance issues were resolved, the integrated package has become a serious contender in the applications market. Despite Telstra's success, implementation and support of these types of platforms is complex, and concerns remain about the scale of hosted solutions as compared to those of OTTs.

Strategy Rule 4—Strengthen the Business Case

It is hard to build a business case that accurately describes the benefits of integrating network and IT domains. Many SP executives simply look at integration as a "must have" capability to be competitive in today's market. In fact, some have been quoted as saying, "We will change or die trying." [6]

The main way to influence the business case is to select and develop the correct portfolio of services (see Figure 3). The areas with high IT complexity (two quadrants on the right) come with high levels of customization and the need for additional headcount. While professional services companies that focus on this domain can attract high margins, SPs will face challenges with a business model that exhibits high custom complexity and delivery risk. Best-effort services (bottom-left quadrant) can more easily be provided by OTTs due to their massive scale and targeted infrastructures.

Figure 3. Profitability Considerations for Network-IT Integration



Source: Cisco IBSG, 2009

The "sweet spot" for SPs is to create, foster, and penetrate the high network-IT interdependency domain (upper-left quadrant) where process complexity is still low and scalability prevails. Services in this quadrant include value-added collaboration and communication offerings, as well as packages that are hard to deliver without a dedicated network infrastructure, yet sufficiently standardized to allow for scalable, high-margin operations.

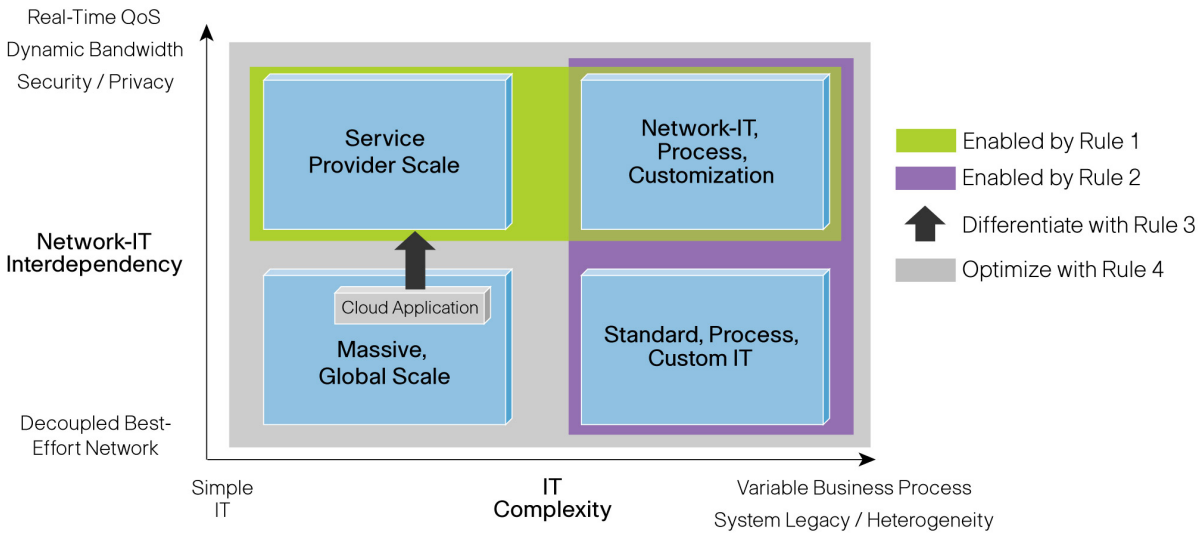
While the upper-left quadrant is the place to focus, SPs should still consider offering a limited number of services in the other quadrants. For example, services in the top-right quadrant help retain large customers. In the bottom-left quadrant, SPs can white-label services from low-cost players to maintain customer ownership for best-effort offerings.

Besides the revenue potential of a structured service portfolio, integrating network and IT domains will significantly reduce costs due to functional synergies and operational process simplification. In addition, as investments are better allocated and "make versus buy" principles are enforced, operating expenditures (OpEx) and capital expenditures (CapEx) can be reduced to enable further strategic investments. In 2008, for example, Swisscom announced cost savings of 330 million Swiss francs from network-IT integration.[7]

Most systems transformation efforts can be summarized as requiring high short-term budgets (OpEx and CapEx). While some of the cost can be balanced against mid-term efficiency gains, most of the transformation needs to be justified with indefinite future incremental revenue streams and the reduced risk of losing established revenue sources. In the Cisco IBSG interviews, SP executives voiced healthy skepticism about the extent of financial upside. Not one participant, however, was able to offer an alternative strategy.

Figure 4 illustrates how the four strategy rules allow SPs to deliver, differentiate, and optimize services across the delivery models.

Figure 4. Summary of Strategy Enablers



Source: Cisco IBSG, 2009

Implementation Rule 1—Deploy an Operating Model that Enables Change and Reduces Costs

Delivering integrated network-IT services using the four production strategies described earlier in Figure 1 requires an appropriate operating model. To be effective, the model must:

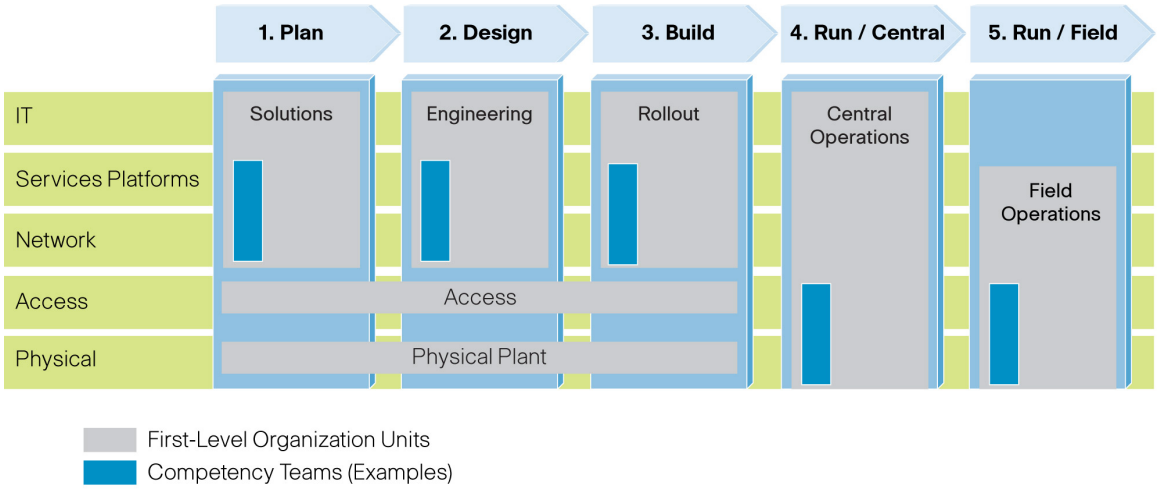
- Include enough integration between network and IT domains to deliver end-to-end services
- Provide a high level of modularity to enable different parts of the delivery model to be sourced externally so development teams can focus entirely on a particular task

"There are significant cultural differences between IT and network domains that an integrated operating model will have to bridge."

Cisco IBSG Interview Respondent

The operating model should be based on an integrated organization (see Figure 5). The organization is mainly oriented along the processes of solutions planning, engineering, roll-out (build), and operations. Technology domains like service platforms, the network, and IT support systems are weaved into the operating model, but no longer play a primary role.

Figure 5. Target Operating Model Structure (Process View, Service Provider Example)



Source: Cisco IBSG, 2009

In the plan, design, and build stages, focused competency teams should be assigned to design across domain services. This helps close gaps in required skill sets since resources can be easily reallocated among domains. Legacy competency teams such as those that support time-division multiplexing (TDM) should operate as part of the integrated framework, yet have a smaller headcount in the solutions and design stages due to the more static nature of TDM operations. These teams can also handle relationships with key suppliers and be retired as the technology is phased out.

In the run stage, operations are typically separated into central and field operations teams. The central team is made up of network and IT management functions. The field team should have a higher headcount and require distributed workforce management across multiple technology domains to allow for the bundling of expertise.

In this structure, the roles of the CIO and CTO have merged to make room for a common delivery organization. Nonetheless, specialization and focus are enabled in the individual competency teams. Definition of process-specific key performance indicators (KPIs) helps focus each organizational unit. Access and physical plant design are organizationally integrated across the plan, build, and run stages since they exhibit stronger inter-dependence and have less interaction with other technology domains.

Overall, removing function duplication leads to some cost savings. The main benefits of the operating model, however, result from providing a more effective way to deliver customer benefits through combined service development and operations.

Implementation Rule 2—Define Network APIs by Balancing Functionality and Simplicity

As a consequence of the operating model shown in Figure 5, internal architecture modules need to be able to "talk" to the network and dynamically deploy and monitor network functionality using standard APIs. APIs that are used internally—and the development ecosystem that surrounds them—will be key enablers of end-to-end network-IT service provisioning.

Internal APIs should be considered at different layers of the protocol stack. Much as in the IT domain, the separation of "raw" service elements from the network is necessary to syndicate services to an ecosystem of business partners. At higher layers of the stack, and with the rise of Web 2.0, SaaS, and service-oriented architectures (SOAs), developers increasingly want to embed communications features in their applications.

This can be enabled by opening communications APIs like click-to-call, conferencing, unified messaging, and location-based services. These APIs will bridge multiple communication standards like voice over IP (VoIP), public switched telephone network (PSTN), voice over instant messenger (VoIM), and mobile voice. Internally, these APIs will need to align with the modularization of the operating mode. Together, they will enable rapid and effective service development.

While Cisco IBSG believes internal APIs are a reasonable way to develop network-IT services, open network APIs have had limited commercial success with external developers. Software developers are not eager to customize their applications to each service provider's API environment. SPs, therefore, would have to form consortia to offer an interoperable "cloud API." [9] It remains to be seen if the speed of standardization is fast enough to keep external de facto standards from new players at bay. Because of this, the commercial success of open network APIs is still in question. Even so, Cisco IBSG recommends closely watching the progress of existing open platforms.

Implementation Rule 3—Virtualize and Automate IT Service Production and Telco Applications

Virtualization and automation are crucial to achieving lower-cost, more agile IT operations. Yet the SP industry is slow to adopt IT virtualization.[10]

There are two reasons for this. First, telco application environments are typically operated in silos, with each application running on dedicated hardware. Second, service components of application-specific delivery platforms are often customized or proprietary, and come bundled with the execution environment. This makes it much more difficult to integrate them with other network service components.

And while a marketplace for tradable IT services is taking shape, silos stand in the way of extending these services across both network and IT domains. SPs should put pressure on telecom application vendors to support virtualized infrastructure and horizontal application integration. In short, to achieve virtualization, SPs must lay the groundwork for creating an integrated service environment.

> "Leveraging cloud-based services will require solutions providers to virtualize their application-layer offerings and provide an alternative to hardware bundling."
>
> Cisco IBSG Interview Respondent

Enterprise hosting is another area where virtualization should be accelerated. Many hosting contracts are built on a "dedicated infrastructure" basis, leading to recurring revenues for SPs. Going forward, competitors such as OTT players will begin to approach these customers with low-cost, multitenant, fully automated environments, putting strong downward pressure on the ROI for dedicated hosting models.

To defend against this potential threat, SPs should work with their clients to migrate to a virtualized, automated environment by relying on their own professional service capabilities. For low-complexity applications, SPs should consider partnerships with external data center operators. Moreover, to increase IT scale, lower costs, and enable continuous learning, IT departments should treat internal business units as enterprise hosting customers that expect SLAs, performance, and price competitiveness just like any other customer.

Implementation Rule 4—Build a Lightweight Umbrella Management Capability

To be effective, converged services must be deployed, managed, and monitored across both network and IT domains. Service providers should have a clear roadmap for developing an integrated management layer across different platforms. This is a complex undertaking.

On the network side, the landscape is extremely fragmented, with each SP running dozens or even hundreds of operation support system (OSS) applications. Additionally, there is no consistency across application architectures, a lack of industry standards, and limited vendor support. To address these challenges, many SPs are using SOA principles,[11] as well as improving the integration of different OSS and business support system (BSS) platforms through an enterprise service bus that enables reusability and scalability of service components.

The IT side is slightly less fragmented, with just four IT management platforms—BMC Software BladeLogic, HP OpenView, IBM Tivoli, and CA Unicenter—capturing 43 percent of the market.[12] Even so, most SPs operate a portfolio of management tools that includes open source applications. The main challenge of moving to a fully automated IT environment is configuration management across server, storage, software, and application domains.

In fact, almost 80 percent of IT organizations see configuration management as important or critical to their success. Nearly all configuration management database (CMDB) implementations, however, fail to meet expectations.[13] Complicating matters further, the introduction of server virtualization makes server, network, and configuration management even more challenging.

While there is a clear need for vendor consolidation and simplification of network and IT management tools, service providers, according to Cisco IBSG's study, did not think any single vendor could offer the required product breadth. Moreover, customers are

uncomfortable changing platforms given current investments in licenses and software scripts that are developed in-house.

A better solution is to use a lightweight, modular, and agile management layer that sits on top of—and communicates with—existing management tools. This layer adds only the functionality needed for end-to-end management and can be easily adjusted for new products and services. This avoids the problem of being locked into a single management solution.

> "The management and orchestration of cloud services will be achieved by an umbrella system that virtually integrates the network with cloud OSS."
>
> Cisco IBSG Interview Respondent

Phased Implementation Approach to Network-IT Convergence

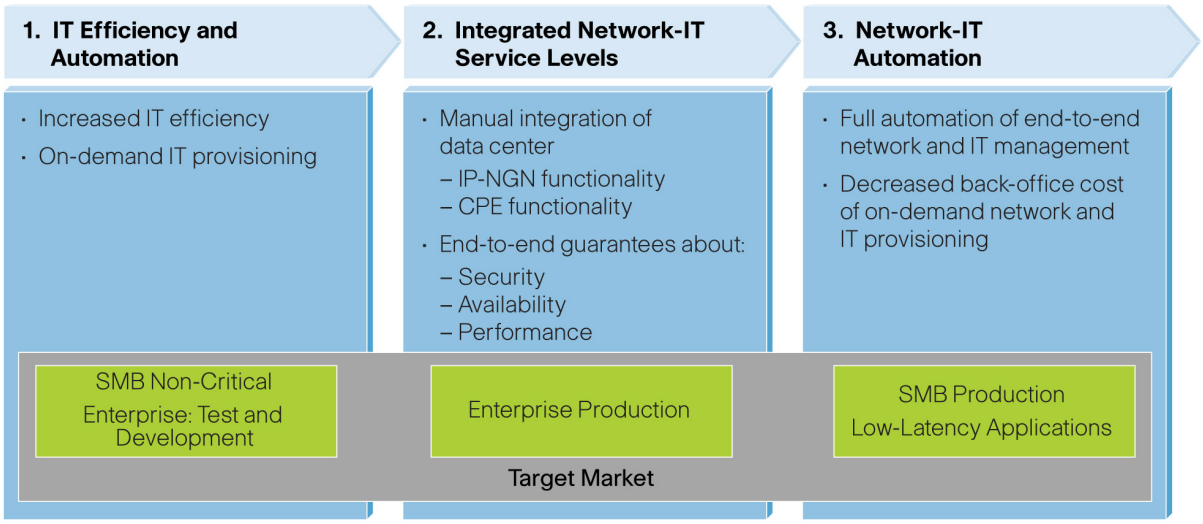
By following the four delivery models shown in Figure 1 and the eight rules described in this paper, SPs will be able to align their network and IT production capabilities to launch more profitable services. Given the benefits, it may be tempting for SPs to "go back to the drawing board" and design a fresh, multiyear network-IT transformation plan.

In reality, however, most SPs are already burdened with a number of transformational projects in both their network and IT environments, all of which are at different stages of completion. Given this, it is more pragmatic to take the existing transformational workload and combine it with a phased approach to attain a fully integrated network-IT service production capability (see Figure 6).

Most SPs are several years away from full, end-to-end, automated control of their network and IT domains. Directing the company culture and service portfolio toward a converged network-IT service capability now, however, can generate value in the short, medium, and long term. In fact, Cisco IBSG's research found that several large SPs are already taking the first steps toward becoming fully integrated, network-IT companies.

> "We already think about network and IT domains as being converged. Our culture and service offerings are heading in that direction. End-to-end automation will be the step that reduces back-office costs and increases the target market."
>
> Cisco IBSG Interview Respondent

Figure 6. A Phased Approach to Network-IT Convergence[14]



Source: Cisco IBSG, 2009

Phase 1. IT Efficiency and Automation

Service providers that increasingly automate data center services will attract customer and service segments that look for cost benefits and have limited requirements regarding performance, security, and availability. Although differentiation from OTT providers is limited, SPs will still attract and retain customers due to the relationship, trust, and proximity they have in the market.

Phase 2. Integrated Network-IT Service Levels

SPs integrate IT propositions with WAN services like IP-VPN and application acceleration. Although network services are manually provisioned, customers will be attracted to the performance, availability, and security that can now be delivered across both network and IT domains, and therefore at the application level.

Phase 3. Network-IT Automation

Service providers can now decrease the provisioning and management costs of integrated network-IT services. This means they can target smaller contracts, drastically increasing the addressable market for their services.

As SPs follow these steps, they will increase their addressable markets and degree of automation, while decreasing the cost to serve customers.

Endnotes

1. "Converged Network-IT Services Part 1: A Service Portfolio Production Strategy To Increase Service Provider Competitiveness," Wouter Belmans, Uwe Lambrette, Hal Gurley, and Scott Puopolo, Cisco IBSG, July 2009.

2. "The Agile Business Architecture: Creating Service Provider Value Through Smart Sourcing," Uwe Lambrette, Hal Gurley, and Scott Puopolo, Cisco IBSG, July 2009.

3. BT acquired Infonet in 2007; Belgacom acquired Telindus in 2005; KPN acquired Getronix in 2007.
4. Deutsche Bank, 2009; TripleTree, 2009; Gartner, 2009; Saugatuck, 2009.
5. "Unlocking the Value of Service Provider Assets To Win the SMB Customer," Seanan Murphy, Cisco IBSG Service Provider Practice, May 2009.
6. "Telco Transformation: Change or Die Trying," Volume 6, Number 8, Heavy Reading, September 2008.
7. "Cost Savings Begin to Materialize in 2008, Multi-Year Benefit," Swisscom Investor Presentation, March 2008.
9. http://www.opencloud.com
10. The telecommunications industry is just behind retail as the slowest adopter of virtualization. Source: Nemertes, 2007.
11. The TeleManagement Forum (TM Forum) meeting in Nice, France in 2008 had numerous presentations on the topic of SOA in OSS.
12. The top four IT management system products today are BMC Software BladeLogic, HP OpenView, CA Unicenter, and IBM Tivoli. In 2007, these companies held 43 percent of the market. Source: Gartner, 2008.
13. "Key Trends in Data Center Operations and Management," Data Center Operations Council, 2008.
14. Phase 1 and phase 2 may happen simultaneously, or even in reverse since the order of these steps depends largely on where SPs are in terms of IT automation and network-IT integration.

More Information

The Cisco Internet Business Solutions Group (IBSG), the global strategic consulting arm of Cisco, helps CXOs and public sector leaders transform their organizations—first by designing innovative business processes, and then by integrating advanced technologies into visionary roadmaps that address key CXO concerns.

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