

Transforming Data Center Complexity to Velocity

Cisco Unified Service Delivery

The global economic crisis has reinforced service provider focus on cost reduction and asset consolidation in service delivery, as highlighted in Goldman Sachs' IT Spending Survey July 2008. The report identified CIOs' top three spending initiatives over the next 12 months as server virtualization, server consolidation and cost cutting. Gartner also commented, "In this current economic climate, IT organizations are especially pressed to continue innovating while cutting costs and increasing efficiency. CIOs will invest in innovative technology if it increases productivity, protects their existing IT investments, and demonstrates real benefits that will extend the life of the data center."

Looking forward, commentators believe that simply focusing on the cost-cutting aspects of virtualization could represent the wrong investment mix when the economy emerges from the current slump. Consolidation and cost-cutting are just the first step in a virtualization journey that can transform service delivery by creating a secure, virtualized experience that optimally connects customers to applications.

Transforming service delivery is essential for meeting the increasingly complex demands of businesses for greater productivity and consumers for more personalized experiences. These service demands are creating the opportunity for a variety of new transaction-based and revenue-sharing business models through new forms of revenue and partnership with content and application providers.

However, service delivery models have evolved as a collection of islands (data centers plus central offices, video head offices and other delivery facilities that are becoming more and more like data centers) and a series of service-based silos that act as a barrier to service delivery speed or service velocity and operational efficiency. The physical separation of storage, servers and networks in this type of service delivery model also prevents service provider from achieving the full benefits of virtualization that are essential to cost control and quality of service delivery. Cisco believes that the Cisco Unified Service Delivery solution will enable service provider to overcome those challenges by eliminating silo-based complexity, liberating assets, reducing costs and accelerating service velocity.

"Gartner believes that Cisco is uniquely positioned to lead the transformation of the data center."
Gartner

“The time is right for integrated data center systems. It makes lots of sense. The server, network and traffic have to be in sync. At some point, all of the silos in the data center need to be taken down.”

IDC

The Cisco Unified Service Delivery solution represents a new way of thinking about service delivery infrastructure – in the data center and the network all the way to the end customer. It is based on tight integration between the application software and the whole network delivering services to the end user, creating a secure, virtualized service-oriented infrastructure for multiple integrated business and consumer services. As well as delivering immediate cost, quality, revenue, and performance benefits, the Cisco Unified Service Delivery solution will help ensure that service providers are prepared for a later transition to ubiquitous cloud services, however they evolve.

The solution is not just about technology. A range of professional services are available to help service providers accelerate the transformation of service delivery and revenue from new services, while mitigating risk, improving predictability, reducing payback times, and upskilling through knowledge transfer.

For example, Cisco Services can help you build a business case that shows how you can save both operational and capital expenditure by re-architecting your data center, or advise you on how to reduce power demands in your data center, or accelerate your transition to a virtualized data center, to enable earlier reductions in capital expenditures (CapEx).

This briefing document is designed to help CTOs and CIOs understand the Cisco Unified Service Delivery solution and assess its potential benefits for their service delivery infrastructure.

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New Business Opportunities

Customer demands are changing rapidly with consumers wanting more visual, social, and personalized experiences, while business customers look for enhanced productivity, increased collaboration, and greater agility from their use of online services.

The new generation of customers expect a richer, higher-quality media experience, and they want access to more kinds of content than ever before. They want to enjoy the same kind of interactivity, personalization, mobility, and control that they have come to expect from the Internet across all media. And they expect to be able to access any type of content, whenever and wherever they choose, over a variety of devices and screens.

These are the key trends that are driving dynamic new business opportunities for service provider:

- **Explosive growth in video traffic.** According to a recent Cisco Visual Networking Index Study, global IP traffic will reach 44 exabytes per month by 2012, with video being the dominant driver of growth. This is more than six times the total traffic in 2007. The study also estimates that video will account for nearly 90 percent of all consumer IP traffic in 2012.
- **Expanding sources of content.** In the past, content was created by major studios and delivered on a one-way basis to consumers. Although professionally-developed entertainment content from major distributors will continue to have large audiences, smaller-scale, semi-professional producers and Over the Top (OTT) providers developing content for niche audiences will play a much larger role in the market. A service provider's ability to manage and deliver content from many different providers will be a key competitive differentiator.
- **Growing variety of end devices.** Customers can now access their content via a multitude of devices, including standard or high-definition television, personal computers, gaming consoles, smartphones and portable media devices. Service providers with the infrastructure to serve all of these end devices cost-effectively will increase revenue and customer retention levels.
- **Increasing social and interactive experiences.** Growing numbers of consumers and business users are already engaged in rich social networking and interactive content sharing on the Internet. They expect service providers to bring those same Web 2.0 capabilities to other media devices, bringing personalized home pages, sites such as MySpace and Flickr, RSS feeds and Web content into the whole media experience. Service Providers who can deliver these capabilities will increase revenue and customer loyalty. They will also benefit from new income streams such as advertising and partner revenue sharing opportunities.
- **Greater mobility.** Customers want content that adapts to their own lives and schedules. They want to access whatever they want, whenever they want, wherever and however they choose. That means the ability to record and share content over the network, to access time-shift services and to extend media content across multiple devices such as TV, PC or mobile device, even within a single session.

Delivering a media experience like this can be challenging so it is important to develop a comprehensive business case. To help service providers create a platform for new revenue-generating services, Cisco offers a range of Advisory Services that provide consultancy at the architectural level to define new business and service-based models and deliver operational process transformation. The services focus on the alignment of business and IT processes, as well as identifying important metrics.

The service providers who can meet these challenges will make the transition from conventional service provider to next-generation “experience provider”. They won’t just move up the “food chain”, they will be able to develop new, more sophisticated business models based on profitable new revenue streams, wider content provider relationships, growing market share, increased revenue per customer, stronger customer loyalty, and clearer differentiation from competitors.

Service Delivery Challenges

Changing customer demands and new service requirements put increasing pressure on service providers. It’s not enough just to deliver new types of content.

To meet today’s customer demands, service providers must balance a number of operational requirements:

- Manage increasing volumes of rich multimedia content
- Manage the interaction of new services with existing core services
- Manage content sourced from multiple application and content providers
- Ensure exceptional quality of experience (QoE) with end-to-end SLAs
- Ensure the highest levels of security in a multi-service, multi-tenant environment
- Scale the experience efficiently and cost-effectively
- Deliver content across a variety of devices
- Roll-out new services quickly.

Challenging Times: Businesses and Consumers are Demanding New Services

Consumers Want More Personalized Experiences

Businesses Demand Greater Productivity Experiences

Consumer Experiences: More Visual, More Social, More Personal

Business Experiences: More Collaboration, Better Returns, Improved Agility

In meeting these new service delivery requirements, service providers face three competing challenges:

1. The need to consolidate infrastructure as much as possible to reduce costs
2. The need to distribute infrastructure to provide higher quality of experience by pushing content such as video as close as possible to customers.
3. Improving efficiency and operational simplicity which is critical for a service provider to compete; services providers must virtualize.

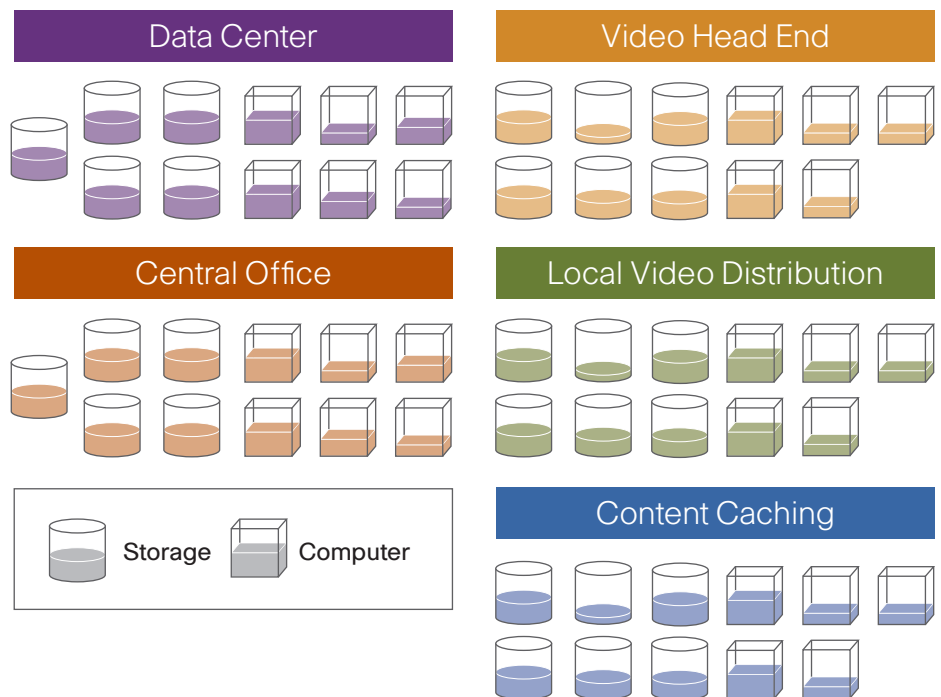
Cisco believes that it is important for service providers to have an end-to-end perspective of service delivery so that they can create the optimum experiences for their customers. In addition, Cisco has various support offerings that can enable service providers to achieve predictable outcomes in this nascent area.

To take advantage of new business opportunities and maintain profitability, service providers need to balance the increasing complex service requirements with stringent cost control so improving efficiency and operational simplicity are critical for service providers to compete. However, the historical development of many service delivery models has left a legacy of complexity and high costs. Service delivery infrastructures are made up of computer servers, networks, and storage systems. During the past 20 years, these three components have become islands unto themselves.

Cisco has identified a further three dimensions within the service delivery infrastructure:

1. Multiple physical centers spread throughout the service provider’s network
2. Separate service silos within each physical center
3. Servers from different vendors that have been specified by third-party content and application providers or the service providers themselves.

Challenging Times: Service Providers are under Increasing Pressure
Managing Service Delivery Islands and Increasing Complexity



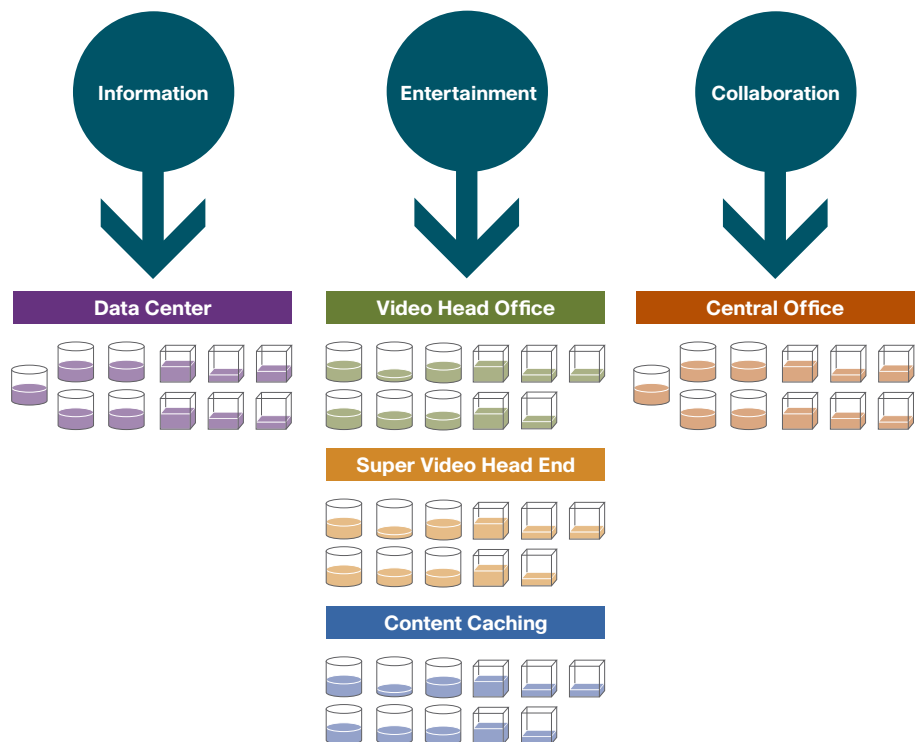
According to Gartner, “Many of the problems in the data center stem from incongruent silos of networking, computing and storage technologies. Each area has its own layer of administration, people, tools, interfaces, and quirks. The skills and personnel in these facilities have been as divided as its technology.”

The siloed nature of service delivery creates service delivery “islands” and means duplication of resources, as well as increased complexity and cost. It also means that new services have to be built from the ground up. Service delivery islands are difficult to manage and scale, resulting in redundancy and other barriers to ensuring the anytime, anywhere delivery that customers demand.

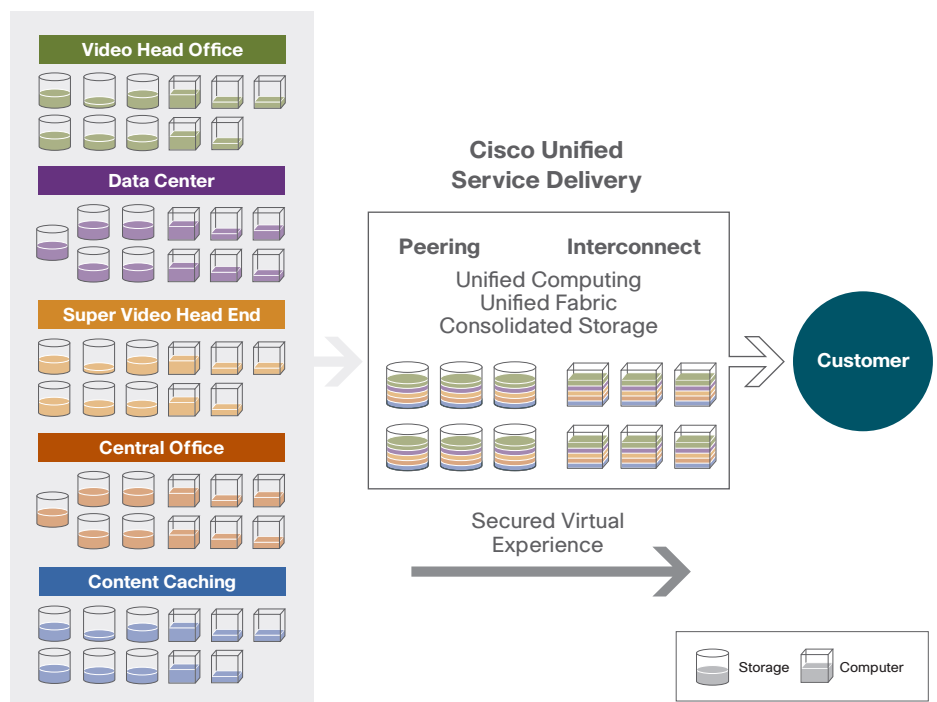
IDC commented, “The time is right for integrated data center systems. It makes lots of sense. The server, network, and traffic have to be in sync. At some point, all of the silos in the data center need to be taken down.”

Until now, the equipment required to break down these silo barriers was not available. Essentially, this challenge required a common infrastructure across all the elements. Service providers who overcome these silo-based issues can continue to separate their services from a business point of view, but won't need to separate them physically. In addition, third-party providers won't need to worry about which physical server their application or content resides on. In the longer term, service providers can link those physical islands and multiple centers together to create a single virtual service delivery center.

Managing multiple service delivery islands and ever increasing complexity



Unified Service Delivery virtualizes all Service Provider resources to deliver the secured virtualized experience



Virtualization opportunity & challenges

The next-generation service provider must perform a careful balancing act. On the one hand, they need to meet strategic business requirements, delivering a growing portfolio of multimedia applications, content and services to users under strict SLAs. At the same time, they must deal with operational issues such as controlling power and cooling costs, utilizing and provisioning assets effectively, and ensuring security and availability.

A key element in dealing with operational challenges and optimizing service delivery is virtualization. Many service providers have already turned to virtualization to reduce their costs and improve asset utilization by supporting server consolidation. Without server virtualization, service providers must overprovision their resources to handle peaks, operating below capacity the rest of the time. Virtualization can dramatically simplify and streamline service delivery operations. Creating a standard server in software which has been tested against an application means rolling out a new server is just a software installation. This can deliver a major reduction in operating expenses by increasing the number of servers each administrator can handle. That means lower headcount, fewer mistakes or exceptions, and increased reliability and stability.

However, although virtualization appears to offer a clear path towards improving service delivery, experience indicates that, in many cases, the technology has also created greater complexity and increased the burden of management. Like physical servers, virtual servers need to talk to each other as well as to the network and other machines. Operational staff must identify, monitor, move, and update these devices. And, with each physical server hosting a number of virtual machines, virtualization creates many more servers for staff to manage and maintain. Virtualization has been a challenge for many service providers. Because it has increased their operational problems, they have been reluctant to take virtualization very far and have failed to realize significant benefits.

“Today, the architectural shift in the data center marks an IT market transition that will drive the benefits of virtualization to an entirely new level. It will help customers respond to changing business demands by providing support for virtualization directly into the data center infrastructure.

By increasing the performance and scale of virtualized environments, while at the same time improving the ability to control and manage virtual workloads, this solution has the potential to deliver the full benefits of virtualization across the data center to increase productivity and agility and reduce IT costs.”

IDC

Cisco’s Vision for Transforming Service Delivery

Cisco’s strategy for dealing with the challenges facing service providers is the Cisco Unified Service Delivery solution – an approach that represents a new way of thinking about service delivery infrastructure. Analysts believe that there is a fundamental shift in service delivery architecture, with three choices available to service providers – server-based computing from a traditional server-based architecture, mainframe-based computing or network-centric computing. Cisco believes that moving to a network-centric architecture will create more pervasive and transparent sensibility to services.

The emphasis is on transforming service delivery holistically from application to consumer and it marks the transition from classic data center (central office, video serving office or other service delivery facility) to next-generation data center or the service delivery center. This new Unified Service Delivery is based on tight integration between the application software and the whole network delivering services to the end user, creating a secure, virtualized service-oriented infrastructure for multiple integrated business and consumer services.

The Cisco Unified Service Delivery solution is the convergence of two trends:

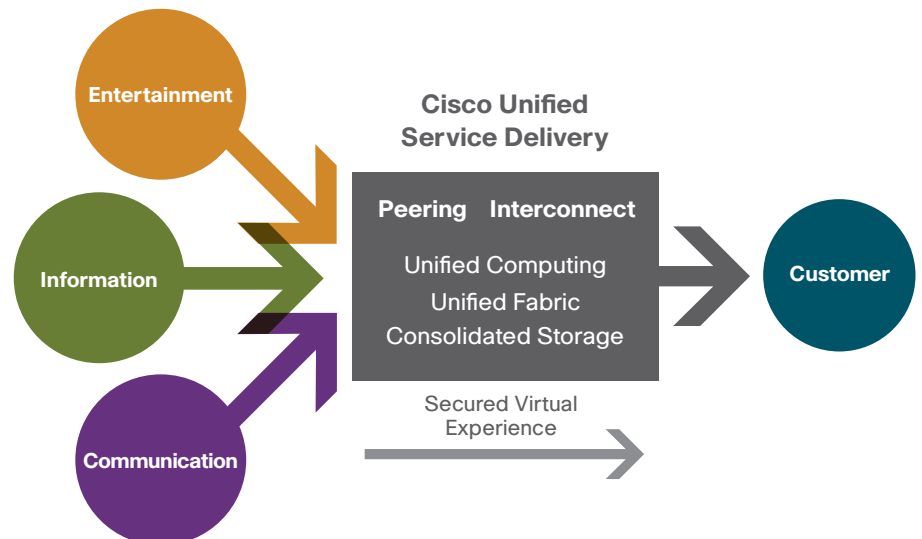
1. The re-engineering of the classic data center service delivery model with unified computing, virtualization, and unified fabric
2. The deployment of next-generation networks to provide network intelligence, peering, interconnect, and application performance and security.

This represents an alignment of Cisco’s strengths in IP networking with a service provider’s strengths in service delivery. It is the only way service providers will solve the silo problem and meet the conflicting demands of consolidation and quality of experience – a challenge that will only get more difficult with the continuing growth of high-definition data traffic.

From a data center perspective, the Cisco Unified Service Delivery solution re-engineers service delivery infrastructures to meet business and operational demands. It builds on developments in consolidation, virtualization and unification to combine all service delivery islands, eliminating the silo problem and creating a common service-oriented infrastructure for the complete service portfolio. This reduces cost, introduces more accessibility, automatic redundancy and much more transparent management. The service-oriented infrastructure provides a single modular system that is simpler to manage and scales as a single system without increasing complexity. The creation of a common infrastructure reduces the complexity of set-up, cabling, cooling, provisioning and resource allocation.

Unified Service Delivery

Combines all the service delivery islands to deliver the secure virtualized experience



From a network perspective, the Cisco Unified Service Delivery solution reconciles the conflicting demands of consolidation and distribution by making the service delivery infrastructure network-centric rather than server-centric. It interlocks application software with the whole network, and delivers content to customers.

Next-generation IP networks are able to unify the array of connection and networking standards found in different parts of the service delivery infrastructure. Until now, service providers have had to run multiple parallel network connections for server-to-server connections, Internet links and storage systems. The latest IP networking technologies can consolidate all service delivery communications into one protocol known as Data Center Ethernet. This protocol is quickly becoming an industry standard and is a crucial building block in reducing the complexity of service delivery within the data center facility. It provides redundancy at the lowest cost and offers the capabilities needed for handling the kind of virtualized applications that will run in a service delivery center.

Next-generation IP networks also provide the performance, intelligence, and peering to optimize the whole of service delivery infrastructures for virtualization. By optimizing the network for virtualization and linking servers, storage, and all the elements that need to be virtualized together, the network can link the application or content to the user no matter where it is running, no matter what server.

The Cisco Unified Service Delivery architecture enables service providers to incorporate different elements to deliver specific types of application. It provides a common infrastructure network, computing and storage so that it doesn't matter what the service is. Specific services such as video or collaboration may require different elements, so the service provider can add the appropriate application housed within a common infrastructure and add all virtualized elements. To run multiple services side by side, security is very important. The Cisco Unified Service Delivery solution is designed to provide performance, cost and security – all at the same time – in the form of a secure virtualized experience. This enables the service provider to deliver multiple, integrated services securely, at reduced cost and with increased velocity.

The Cisco Unified Service Delivery solution also gives service providers an opportunity to create a greener service delivery model with reduced cooling requirements and greater energy efficiency. Industry experience indicates that utilization of servers can go up from less than 20 percent to 70 percent or more, with reduced property requirements.

The virtualized approach combines the manageability, energy, and space savings of a centralized infrastructure with the flexibility of a locally distributed system to:

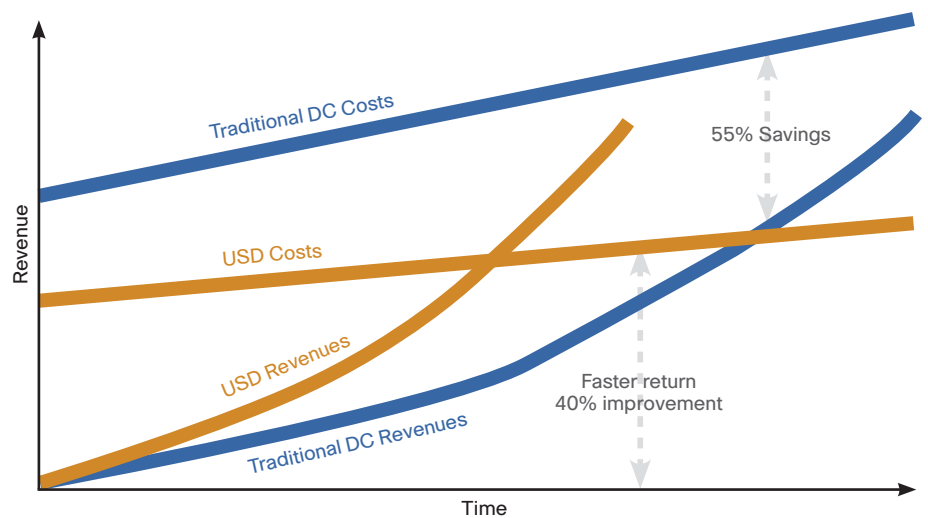
- Increase the operational efficiency and utilization of service delivery infrastructure
- Reduce power consumption and cooling requirements
- Eliminate underutilized and low-value infrastructure.

Transforming service delivery is critical to service provider success and profitability. To help service providers take advantage of the opportunities, Cisco provides a range of Advanced Services that define, engineer and optimize service delivery to accelerate new service delivery and reduce costs. Cisco specialists design solutions that enable new services to be fitted into the overall infrastructure while optimizing the infrastructure and minimizing the impact on existing services.

Transforming Costs and Revenue without Spending More

The Cisco Unified Service Delivery solution enables service providers to re-engineer their finances, with both top- and bottom-line impact, by re-appropriating existing OpEx and CapEx rather than spending more.

Unified Service Delivery Financial Re-engineering



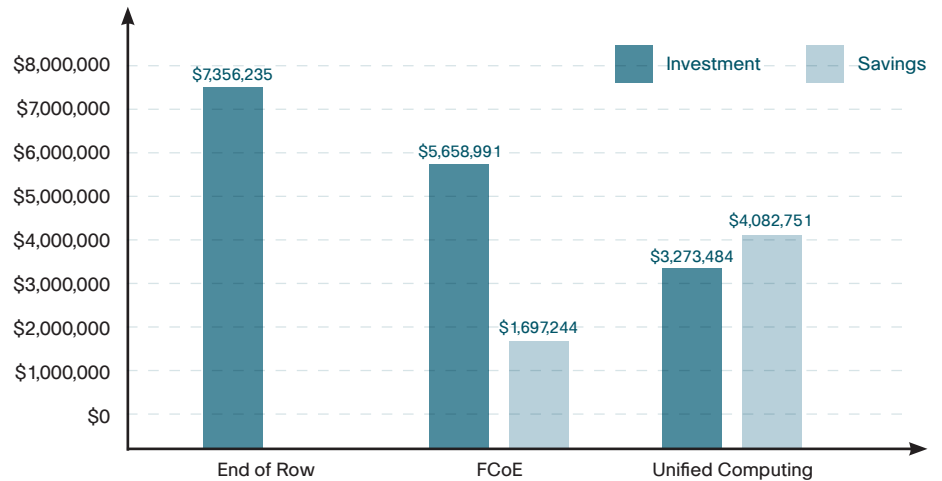
From a cost perspective, implementing the Cisco Unified Service Delivery solution delivers a clear advantage by reducing the operational complexity involved in managing disparate silo-based environments. Cisco estimates that this can achieve a combined OpEx/CapEx saving of 55 percent on traditional service delivery costs and provide 40 percent improvement in ROI.

The key areas of savings include:

- Consolidation of servers, storage, and network facilities
- Reduced cabling
- Elimination of multiple parallel networks and interfaces
- Lower cooling and power consumption requirements
- Reduced space requirements
- Simplified administration, maintenance, and management.

Service providers can manage rapidly expanding bandwidth requirements more effectively and deliver more content, more efficiently without increasing costs. The solution also provides a highly flexible, scalable, standards-based platform that can continually adapt to new services and requirements, providing ongoing investment protection. By utilizing Cisco Advanced Services, service providers can reduce the upfront costs that need to be factored into the business case for transforming service delivery. Cisco has the tools, processes, people, and experience to help eliminate risk before revenue and provide predictable outcomes from the outset. Service providers do not incur initial upskilling costs and do not have to make provision for failure costs in the business case.

An example ROI Assessment Service



An example illustrates the potential savings in utilizing the Cisco Unified Service Delivery solution to transform service delivery for a facility with 1000 servers:

- An “end-of-row” solution could incur approximately US\$73 million in upfront costs
- A Fibre Channel solution could incur approximately 5.6 million in upfront costs
- A Cisco Unified Service Delivery solution could incur just 3.3 million in upfront costs, yielding potential savings in excess of 4 million.

From a revenue perspective, the Cisco Unified Service Delivery solution enables service providers to meet and profit from changing customer demands. The service-oriented infrastructure liberates resources, while the tight integration between servers, storage and delivery networks allows resources to be pushed to where they are most needed. Now a common infrastructure supports all services, allowing service providers to quickly and easily add new services to their portfolio and deliver resource-intensive multimedia services without creating new silos or investing in additional infrastructure. This increases service velocity and supports a growing service portfolio. The single infrastructure also simplifies scalability to meet changing levels of demand, improving business agility.

The Cisco Unified Service Delivery solution also provides the quality of experience that is important to maintaining high levels of customer satisfaction. By combining network intelligence, hierarchical quality of service, end-to-end service level agreements and application acceleration and performance, the Cisco Unified Service Delivery solution enables service providers to deliver and scale high-quality customer experiences across national and transnational networks, while minimizing costs and complexity.

The Cisco Unified Service Delivery solution enables service providers to move from a basic subscriber revenue model to a more sophisticated revenue model. The secure virtualized experience overcomes traditional dependencies on content format, delivery protocol, and playback device, allowing service providers to make content available whenever and wherever customers want it. This provides opportunities to monetize new offerings and service tiers, linking customers directly with content providers, offering opportunities for a variety of transaction-based and revenue-sharing business models.

Service providers can also monetize the exceptional quality of experience of the Cisco Unified Service Delivery solution itself by offering over-the-top (OTT) content providers the opportunity to ensure that their own customers receive the highest possible quality and capabilities. OTT providers such as YouTube and social networks have the loyalty of their customers but don't have the ability of service providers to control quality of end user experience. Service providers can treat OTT content providers as partners rather than competitors, working with them as retail outlets for their own services or providing essential transportation and delivery facilities. Cisco's vision is that, in the long term, OTT providers will become an integral part of a mature ecosystem, a complex distribution chain of organizations developing and delivering content.

Cisco's Advanced Services can help service providers get new services to market faster, accelerating revenue and payback. Cisco CapitalSM also offers flexible deferred payment options that enable service providers to make the investment in service transformation before revenue flows.

Migrating to a Unified Service Delivery Infrastructure

The Cisco Unified Service Delivery solution is part of an evolutionary path for service providers, and builds on existing developments in service delivery consolidation, virtualization, and unification.

Cisco believes that the best way to migrate to the new service delivery model is to follow a three-stage process:

1. Identify how and where to consolidate the infrastructure to eliminate individual silos
2. Virtualize resources and see how best to run applications from virtual machine containers
3. Unify network resources, storage resources, and computing resources.

This is a clear, proven process with support available in the form of Cisco professional services to help service providers accelerate the benefits of new business opportunities and reduce CapEx and OpEx.

Cisco professional services provide important support at every stage of the migration:

- **Advisory Services** help define new business and service models and deliver operational process transformation.
- **Advanced Services** help define, engineer and optimize service delivery infrastructure to enable new service delivery and reduce costs.
- **Technical Services** provide traditional maintenance support plus proactive diagnostic capabilities to help assure higher availability, lower operational costs, and reduce risk.
- **Remote Management Services** provide comprehensive 24-hour remote monitoring, issue resolution, and day-to-day management.

A key element in the migration process is knowledge transfer. By working closely with internal teams, Cisco support specialists transfer knowledge, upskilling service provider staff, and reducing future risk

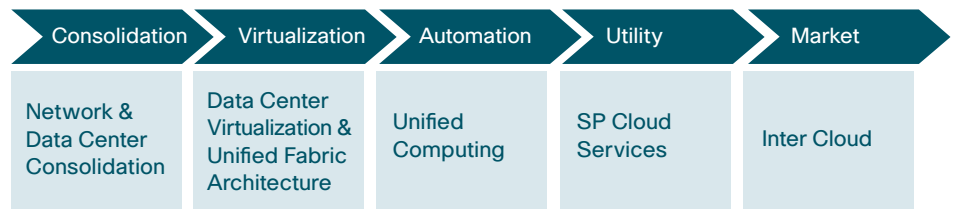
Cisco and Next Generation Service Delivery

As Service Providers strive to deliver the rich personal, social, and interactive media experiences their customers demand, they face new technical, operational and economic challenges. Those Service Providers that can meet these challenges and become true experience providers have an unprecedented opportunity to become market leaders in the next generation of groundbreaking media services. Service Providers who implement the Cisco Unified Service Delivery solution can transform the customer experience, deliver unmatched quality and performance, accelerate service velocity across vast geographies, and unlock lucrative new revenue opportunities.

To create the Cisco Unified Service Delivery solution and support the longer-term transition to broad cloud-based services, Cisco is partnering with Service Providers and an ecosystem of business partners. From the outset, Cisco has worked with best of breed vendors to integrate all the elements that meet the needs of today's service delivery requirements and applications while providing the foundation for tomorrow's services and applications.

Cisco's commitment to the development and deployment of the Cisco Unified Service Delivery solution is an integral part of its Data Center 3.0 and IP next-generation network strategies which are providing the infrastructure for the next generation of service delivery of high-value services. Cisco has always provided networking gear for deployment in data centers and Wide Area Networks, the latest generation of products and solutions combined with an unrivalled eco-system of virtualization, technology, application and business process partners marks a new stage in the transformation of Service Provider business.

Transition to SP Cloud Services



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