



WHITE PAPER

CREATING BUSINESS VALUE AND OPERATIONAL EXCELLENCE WITH THE CISCO SYSTEMS LIFECYCLE SERVICES APPROACH

Cisco Systems® and its partners take a lifecycle approach to deploying and operating the network. This approach helps companies to accelerate their success with advanced technologies and to improve their network's business value and return on investment.

SUMMARY

As the network has become a more strategic asset, the need for higher availability, security, and reliability has increased. Delivering what companies require to achieve a converged, complex network takes specialized knowledge and skills in a growing list of advanced technologies that includes security, voice, wireless LAN, and storage networking.

Cisco and its partners recognize that customer success in the adoption of advanced technologies is compromised if a consistent, proven methodology is not used. To that end, this paper discusses an approach to deploying and operating a network that supports the introduction of new technologies. The approach aligns business and technical requirements through all six phases of the network lifecycle: prepare, plan, design, implement, operate, and optimize.

Equally important to a consistent, proven methodology is the ability of that methodology to be applied to different types of companies with various sizes, locations, geographic reaches, and overall technology requirements. Therefore, this paper also emphasizes the criticality of selecting a networking systems supplier with a strong, diverse, broad-reaching ecosystem of partners that can understand unique business requirements and application needs as well as they understand the network.

This paper describes principles and practices companies can use to support business goals through a lifecycle approach to the network that includes:

- Establishing a technology vision, business case, and high-level conceptual architecture
- Priming the network by properly assessing the existing environment to determine whether it can support the proposed system
- Designing a system that meets business and technical requirements
- Integrating the new solution without disrupting the network or creating points of vulnerability
- Maintaining network health through day-to-day operations
- Achieving operational excellence by adapting the architecture, operation, and performance of the network to ever-changing business goals

BUSINESS AND OPERATIONAL CHALLENGES THROUGHOUT THE NETWORK LIFECYCLE

The Network as an Enabler of Business Success

The world is evolving from a place where networking is about connectivity to one where networking is intelligent, where the network plays a vital role in helping to improve business performance and processes. Intelligence enhances the network's role as a foundation for enabling communication, collaboration, and business success. With increased awareness of the applications that operate on the network foundation, the network becomes an active participant in applications, network management, business systems, and services to enable them to work better.

Integrating intelligence into the network calls for aligning network and business requirements throughout the network lifecycle. This integration is essential for managing the increased complexity that results from the additional capabilities intelligent networking delivers.

Network-Related Business Goals

Companies seek business value and return on investment from their networks in four primary areas:

- **Lowering the total cost of network ownership**—Companies try to lower the total cost of network ownership while they add new technologies to an existing network, procure equipment, train staff, manage network performance, and maintain the network.
- **Improving business agility**—Business agility can be described as an organization’s ability to respond rapidly to changing business or market conditions¹ and adapt to the changing demands of its customers and the business environment.² “In the long term,” industry analyst Gartner writes, “perhaps the most important role for business leaders is to identify the agenda for agility and to prepare the organization to face threats.”³
- **Speeding access to applications and services**—Speeding access to applications and services helps enable business agility. For example, an IP Communications system could be outfitted with a customer relationship application that enables incoming calls to automatically trigger the display of customer account information and contact history, providing staff with the information they need to respond quickly and effectively.
- **Increasing availability**—Downtime can adversely affect revenue and can reduce profitability through costs associated with the network staff having to troubleshoot and function in a reactive mode. High availability depends on carefully planned redundancy, sound security, and scalability and also requires diligence throughout the network lifecycle.⁴ Availability targets are influenced by business goals. Targets are established early in the network lifecycle and achieved throughout it: a smooth, well-planned deployment helps minimize risk of downtime, and sound planning for day-to-day operations helps speed problem resolution.

Evolving Beyond Short-Term Approaches to Network Support


Businesses have expanded their networks in size, business utility, and strategic value. Yet when they continue to use traditional short-term approaches to network support, the results can include lost productivity, unrealized network potential, and competitive disadvantage. Enabling an effective, efficient deployment of advanced technologies with minimal disruption to business calls for a lifecycle approach. Two technologies exemplify the lifecycle approach that today’s complex network environments require in order to enable business success: IP Communications and security.

IP Communications

As companies began to deploy IP Communications in substantial numbers over the past few years, many encountered challenges in trying to implement the technology on a network unable to support it. A primary cause of this difficulty was a lack of in-house expertise to plan effectively for the deployment. Some companies had tremendous experience in data networks, whereas others primarily had knowledge of voice networks. Few, however, possessed the knowledge and skill to build a converged network that would reliably transport both data and voice.

Because of this knowledge gap, deployment plans often were insufficient and incomplete. Projects went ahead without a realistic understanding of the bandwidth, traffic prioritization, and other requirements needed to support such an advanced and business-critical network.

Unfortunately, many companies considering IP Communications face the same situation today. Companies may have difficulty determining if their networks can support high-quality IP Communications. Furthermore, they might be challenged



to ascertain, in a systematic and quantifiable way, how to redesign and upgrade their networks to help ensure the smooth flow of data and voice and to realize their business goals.

When voice is running across the network, uptime is even more critical than it is in the data world. To maximize availability and position themselves for success, companies take a lifecycle approach. An IP Communications deployment using the lifecycle approach includes an assessment of the network environment early in the process. Assessments identify gaps between the current state of the network's devices, processes, and services and what is needed to support robust, dependable IP Communications. Based on assessment results, plans are established for changing the network design, hardware, software, power and environmental elements, LAN and WAN bandwidth, and more. These efforts set the stage for success as companies make sure the network is properly designed and establish a well-developed plan to be sure the proper resources are in place.

Network Security

Network security has historically been approached as a collection of products used primarily to secure the network perimeter or site-to-site connectivity. Today, finding and fixing individual network security holes and point problems are not enough because the cost of security breaches or disruptions is high and can take many forms. These include network downtime, theft of proprietary information, loss of revenue, diminished goodwill, the cost of diverting staff from critical projects to respond to breaches, and reduced IT and business productivity.

The availability of sophisticated exploits, the proliferation of software vulnerabilities, and the growing level of terrorist and criminal activity directed at communications networks have heightened the need for network and system security. In addition, networks carry more mission-critical applications than in the past, making the costs of downtime severe and the need to minimize security breaches and downtime crucial.

Security now requires a system-level approach to securing the entire network—the perimeter, data centers, campus LAN, wireless LAN, desktops, and endpoint hosts. Securing the network is an ongoing process that enables the corporation to help ensure the efficient and effective pursuit of corporate missions and goals. Every organization needs a comprehensive network security process that aligns business goals with network capabilities and technical requirements.

An effective approach to network security prevents the loss of customer or partner data. It controls resources, complies with regulations, and helps avoid or mitigate potential legal and financial liabilities. It employs designs, processes, and systems that help protect critical resources and facilitate user access.

A properly designed and applied security process should be aligned within the framework of a company's corporate governance, IT governance, and network governance systems. A well-designed network governance model optimizes stakeholder value, recognizing the needs not only of shareholders, but also of customers, suppliers, employees, and other stakeholder communities. A security process that is firmly embedded in and built around network governance will have elements of network security policy, goals, assessment, implementation, and operation.

ACCELERATING SUCCESS WITH ADVANCED TECHNOLOGIES THROUGH A LIFECYCLE APPROACH

Supporting Business Requirements Throughout the Network Lifecycle

Companies work toward achieving network-related business goals—lowering the total cost of network ownership, improving business agility, speeding access to applications and services, and increasing availability—throughout the lifecycle of the

network. The network lifecycle has six distinct phases: prepare, plan, design, implement, operate, and optimize (Figure 1). A lifecycle approach orchestrates the alignment of business and technical requirements at every phase.

Prepare Phase

As one enterprise network manager observed, true alignment with the business is necessary in order for IT to provide companies with competitive advantage.⁵ In the prepare phase of the network lifecycle, a company establishes business requirements and a corresponding technology vision. The company develops a technology strategy and identifies the technologies that can best support its growth plans. After the financial and business value of migrating to a particular advanced technology solution has been assessed, the company establishes a high-level, conceptual architecture of the proposed system and validates features and functionality documented in the high-level design through proof-of-concept testing.

Plan Phase

In the plan phase of the network lifecycle, a company assesses its network to determine if the existing system infrastructure, sites, and operational environment are able to support its proposed system. The organization tries to make sure that adequate resources are available to manage the technology deployment project from planning through design and implementation. To plan for network security, the company assesses its system, networks, and information against intruders and assesses the network for threat of outside, untrustworthy networks gaining access to internal, trusted networks and systems. A project plan is created to help manage the tasks, risk, problems, responsibilities, critical milestones, and resources required to implement changes to the network. The project plan aligns with the scope, cost, and resource parameters established in the original business requirements.

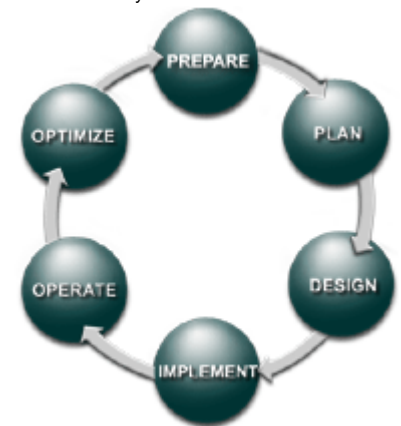
Design Phase

During the design phase of the network lifecycle, a company develops a comprehensive detailed design that meets current business and technical requirements and incorporates specifications to support availability, reliability, security, scalability, and performance. In addition, the company develops a comprehensive design specific to the technology system's operations and network management processes and tools. Where applicable, custom applications are created for the technology to meet the organization's requirements and to enable integration with the existing network infrastructure. A variety of plans is developed during the design phase to guide activities such as configuring and testing connectivity, deploying and commissioning the proposed system, migrating network services, demonstrating network functionality, and validating network operation.

Implement Phase

In the implement phase, a company works to integrate devices without disrupting the existing network or creating points of vulnerability. The company might stage and test the proposed system before deploying it. After identifying and resolving any system implementation problems, the company installs, configures, and integrates system components and installs, configures, tests, and commissions the operations and network management system. Once network services have been migrated, the company validates that its operational network is working as intended, validates system operations, and works to close gaps in staff skills.

Figure 1. The six phases of the network lifecycle.



Operate Phase

Network operations represent a large part of a company's IT budget. An organization spends substantial time in this phase, living with the technology in the company's environment. Throughout the operate phase, a company maintains the ongoing health of its system, proactively monitoring and managing it to maximize its performance, capacity, availability, reliability, and security. The company manages and resolves problems or changes affecting its system, replacing or repairing hardware as needed. It makes physical and logical moves, adds, and changes and keeps system software and applications current, and it manages hardware and software suppliers to help ensure efficient delivery of products or services.

Optimize Phase

The paramount goal of the optimize phase is achievement of operational excellence through ongoing efforts to improve the performance and functionality of the system. A company tries to ensure that its operational system is meeting the objectives and requirements established in the company's business case and works to improve system performance and security. Management practices are enhanced by improving network deployability and operational efficiencies through a network management system that automates, integrates, and simplifies management processes and tools.

Business requirements are regularly updated and checked against the network's technology strategy, performance, and operations. The network must be adaptable and prepared to cope with these new or changing requirements. As it is changed to support new business requirements or to enhance performance, the network reenters the prepare phase of its lifecycle.

Table 1. A Simplified View of the Cisco Lifecycle Services Approach


Prepare	Plan and Design	Implement	Operate	Optimize
Develop the business plan	Manage the deployment project	Stage the system	Support and troubleshoot the system	Align to business case
	Assess network readiness, operations, and applications	Implement the system	Complete moves, additions, and changes	Assess technologies and the system
	Develop deployment plans	Integrate specialized applications	Monitor and manage the system	Improve operations
	Design the system	Test for system acceptance		
	Develop specialized applications			

Building Services to Meet Customer Needs

Services by Segment and Technology

The Cisco Lifecycle Services approach helps companies succeed with advanced technologies through a broad portfolio of targeted end-to-end services that are aligned with Cisco core and advanced technology solutions. This model views companies in a segmented way, enabling Cisco partners, and, where appropriate, Cisco, to build integrated relationships and deliver the level of support companies need when they need it. The service and support needs of a large enterprise, for example, differ from those of a smaller commercial business or a service provider.

The vision for Cisco Lifecycle Services is to tailor services by customer segment and by technology, defining the minimum set of services necessary for customers in a particular segment to be successful with a specific technology. Cisco Lifecycle Services are currently being defined for IP Communications, IP Contact Center, Security, Wireless LAN, Storage, Optical,



Operations Support System/Network Management System (OSS/NMS), Public WLAN, Service Provider Voice, and Application-Oriented Networking (AON) in the first phase. The Cisco Lifecycle Services approach will be incorporated into the development plans for new products and technologies and into major product revisions moving forward.

Leading Practices Through Recognized Standards

Cisco Lifecycle Services are built to the standards of the Information Technology Infrastructure Library (ITIL) and other standards-based frameworks, including Enhanced Telecom Operations Map (eTOM) and fault, configuration, accounting, performance, and security (FCAPS). ITIL is one of the leading frameworks for helping businesses improve services support and delivery. It is a comprehensive documentation of leading practices for the provision, support, and management of effective IT services, and it underpins the British Standard IT Service Management (ITSM) BS 15000.⁶ These standards help IT managers to effectively manage their infrastructures and systems to support the delivery of IT services with the required service levels at an acceptable cost and can help companies use resources efficiently and focus on business-critical activities.

The Lifecycle Model: An IP Communications Deployment

Voice and IP Communications solutions promise reduced costs and improved productivity and collaboration among employees, partners, and customers. Operating a well-run converged communications network demands a consultative systems-engineering approach,⁷ which the Cisco Lifecycle Services model provides.

The recent delivery of an IP Communications solution for a financial institution through the collaboration of Cisco, three of its partners, and the customer demonstrates the Cisco Lifecycle Services model in action. The solution involved the deployment of tens of thousands of Cisco IP Phones at hundreds of branches. The implementation required significant planning, coordination, and complex design for systems and network integration. The significant challenges of converging applications with existing production voice systems had to be considered.


The customer turned to a Cisco partner with which it has a primary relationship to orchestrate the engagement. In addition, the customer relied on Cisco, drawing on its extensive experience with large, complex IP Communications deployments, for service assurance at every phase. The interplay of the partners, Cisco, and the customer in this engagement is indicative of the strong, diverse partner ecosystem that Cisco has built.

Preparing a Technical Solution Aligned with Business and Technology Requirements

In preparing the solution, Cisco, the lead partner on the project, and the customer assessed the customer's business and technology requirements and determined which telephone and voice-mail systems, call center equipment, call accounting and administrative systems, and peripheral equipment would support those requirements. The team created a high-level IP Communications design that addressed the customer's requirements and supported the subsequent phases of the IP Communications deployment, and they developed a business case to support the IP Communications solution. Two additional partners were brought in to deliver technical assistance for proof-of-concept testing of the solution.

Effective Planning to Help Ensure That the Solution Could Be Supported

The customer's solution requirements were defined through a detailed IP Communications requirements plan, and their existing network infrastructure, operational infrastructure, and site facilities were assessed to determine whether the proposed IP Communications solution could be supported. Plans were made to address infrastructure and resource considerations such as hardware, software, power and environmental elements, and bandwidth. Detailed business and operational requirements were defined, and the resiliency of the existing network and operations infrastructure was evaluated. A partner specializing



in project management was brought in to manage the deployment project throughout the planning, design, and implementation phases.

Gearing for Production Through Effective Design

Cisco created a comprehensive, implementation-ready detailed design for the customer's IP Communications solution. Meanwhile, one partner worked with the customer to plan the installation and service-commission-requirements tasks to be staged in a controlled implementation environment emulating the customer's network. Another partner detailed all the tasks related to deploying and commissioning the IP Communications system.

Cisco developed an acceptance test that helped verify that the deployed IP Communications solution was ready for production, as along with a plan to migrate the customer's business and network to IP Communications and decommission the existing private branch exchange (PBX) environment. The customer's resource requirements and staff skills were evaluated, and a curriculum plan was generated to address the identified gaps. The lead partner, Cisco, and the customer developed an implementation-ready operations and network-management design, as well as an operations implementation plan containing a time-staged prioritized schedule. This schedule described resources and responsibilities for all the tasks needed to deploy and commission the customer's operations and network-management infrastructure.

Install, Migrate, Test, Accept, and Implement the System

The customer's core IP Communications solution components were installed and tested in a nonproduction lab environment. The implementation plan was completed, and the system components were installed. Existing services were migrated from the old infrastructure to the new infrastructure, with acceptance testing performed during migration phases. Cisco provided the training and transfer of information pertinent to implementation-phase activities. The lead partner, Cisco, and the customer collaborated to install, configure, test, and commission tools and processes in accordance with the customer's operations implementation plan.

Protecting the Network Investment Through Daily Operations

The lead partner supported the customer throughout the operate phase. Activities included troubleshooting and resolving core network infrastructure and IP Communications solution problems; diagnosing IP Communications hardware problems and providing hardware repair and replacement; and providing software updates, upgrades, and maintenance fixes for IP Communications applications, operating systems, and the network infrastructure. The partner performed configuration changes to support the customer's move, add, and change requests and managed the implementation of changes to the network. The partner protected the customer's foundation and IP Communications networks using security management and performed other services to preserve the ongoing health of the system.

Optimizing the System to Sustain Peak Performance

With the network up and running, the lead partner and the customer revisited the original business case to measure how well the customer was realizing the IP Communications benefits that were presented in the prepare phase. They brought Cisco in to work with them to assess the IP Communications system to validate device configurations, identify areas of network congestion, and study voice quality issues. Because of this effort, changes were recommended to help prevent network problems, increase availability, and enhance functionality. The customer's security environment was also assessed whenever a change was made to the network or the security policy.

Delivering Expertise and Choice Together with Partners

The IP Communications deployment described above, in which the customer had a primary relationship with a Cisco partner that orchestrated the efforts of two other partners and Cisco, demonstrates the value of a partner delivery model. The customer was able to standardize on one brand of equipment, work with one primary partner, and receive the added value of other partners subcontracted for their depth of expertise in particular areas of discipline.

Cisco and its extensive global network of partners develop and deliver Cisco Lifecycle Services collaboratively. Partners are carefully chosen for their capabilities, and Cisco trains, certifies, and authorizes them to deliver services and support for its advanced technologies.⁷ This way, when companies purchase Cisco equipment, they can receive a consistent services approach and delivery across the entire network, regardless of the network's size or geographic reach.

In building its partner ecosystem, Cisco has combined ideal industry resources. Having a broad range of partners to choose from makes it easier for CIOs to find a partner that is familiar with both Cisco technology and their chosen software applications and can provide strong systems integration and ongoing operational support. Having options in expertise is crucial to CIOs because they seek partners that can provide the best support for their organization and company. To be successful, a company needs a partner that understands how to implement not only the network aspect of a solution, but also the other components on the network such as servers and special applications.

Cisco engineers—expert in advanced technologies, including voice, security, storage, wireless, and operations and network management, as well as in project management and curriculum-planning skills—share leading practices for proactive network support and network change management with partners and customers. In enabling its own engineers, its partners, and its customers to support its networking systems and technologies throughout the lifecycle of a solution, Cisco adds to the value customers derive from their IT investments.

CONCLUSION


In the past, companies took short-term approaches to network support that are insufficient for supporting the converged, intelligent, complex networks of today. A lifecycle approach to deploying, operating, and scaling a network aligns business and technical requirements throughout the six phases of the network lifecycle: prepare, plan, design, implement, operate, and optimize. This approach helps companies to lower the cost of owning and operating the network, improves their ability to respond to rapidly changing market conditions, speeds access to applications and services, and helps increase network availability.

Every activity performed at every juncture of the network lifecycle must be carried out with a high level of skill and consistency. To this end, Cisco continually builds and enables an ecosystem of partners that can support the deployment of advanced technologies and can provide that support globally. When companies purchase Cisco equipment, they can receive a consistent services approach and delivery across the entire network, regardless of the network's size or geographic reach.

Companies must protect, optimize, and grow their network platforms using a lifecycle approach that creates business value and operational excellence. This approach provides the most value for IT investments.

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