Case Study

New Messaging System Enables Cisco IP Convergence / IP Communications Infrastructure

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Organization of the Global E-mail and Calendar Case Study

This case study consists of five modules and four associated appendices—the modules are fairly independent of each other. Each module discusses the Global E-mail and Calendar Program from a different perspective—architecture, communications, migration, training, and support. By reading any or all of the five related detailed modules that were part of this global migration, Cisco customers can draw on Cisco IT's real-world experience in these areas to support similar enterprise needs. To view other modules or the complete case study, please visit **http://www.cisco.com/go/ciscoitatwork**

The case study organization is as follows:

Module	Title	Description
1	New E-Mail and Calendar Support Unified Communications Strategy	Provides a high level overview of Cisco IT's worldwide implementation of Microsoft Exchange e-mail and calendaring services within the Cisco global network, an innovative enterprise environment that provides these services to 50,000 users in 70 countries.
2	Leveraging the IP Network on a Global Messaging Architecture	Describes the architecture and engineering solution and details the process that Cisco IT used to design and architect a unified enterprise solution that now reliably handles over 12 million e-mails (10 million internal and 2 million external) a day and calendaring for over 50,000 users globally.
3	Communicating to Drive Enterprise Adoption of New E-Mail and Calendar	Cisco was migrating over 40,000 employees to new Exchange-based calendaring and e-mail systems, but a technology migration is only as successful as its eventual adoption and use; clear communications are critical to user adoption and acceptance. This module describes how Cisco produced and deployed communications throughout the enterprise to improve end-user understanding, acceptance, and utilization.
4	How Cisco Migrated Nearly 40,000 Mailboxes in 16 Weeks	Describes the e-mail migration and calendar cutover processes behind the Cisco IT migration to Microsoft Exchange Server 2003 within the Cisco global network. It provides details on the creation of Exchange client mailboxes and the e-mail migration, and ending with the implementation of a full calendaring system over a single weekend.
5	Training and Support: Helping Users Leap to a New Messaging System	Describes the training and support plans behind Cisco IT's global network migration to Microsoft Exchange Server 2003. It details both the support and training that was provided to users before, during, and after the global migration. User training and user support are both critical to the eventual success of any major service change.
A	E-mail and Calendar Policies and Features	Describes the e-mail and calendaring policies established during the migration and the main features of the new system (see Module 1).
B	Communications Details	Contains a detailed Communications Plan and describes the Exchange Migration Website information architecture (see Module 3).
C	Migration Data Details	Contains detailed information on the e-mail migration pilot and the calendar cutover weekend activities (see Module 4).
D	Support Details	Includes operational support details and the Support Model processes flows (see Module 5).

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MODULE 1

New E-Mail and Calendar Support Unified Communications Strategy

Content

Introduction

Executive Summary

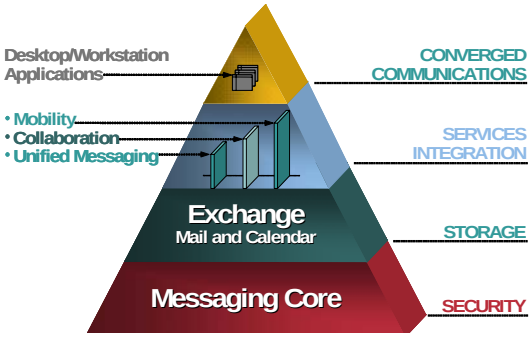
Can exponential growth be bittersweet? Cisco Systems®, a world leader in IP communication solutions, faced this dilemma when accelerated growth caused its internal communication and collaboration requirements to outpace the capacity of its e-mail and calendaring systems. These fragmented tools could not adequately service a network used by over 50,000 employees dispersed throughout 366 sites in 77 countries. With frequent e-mail outages on four different systems and a calendaring product that had reached capacity, these tools no longer met global demands. Furthermore, the lack of a standard messaging system inhibited the implementation of Cisco MeetingPlace® and integration with collaboration products such as mobile mail.

Cisco had attempted more than once to migrate to a more standard messaging environment, but this undertaking required a synergistic blend of strategic vision, strong leadership, innovative design, careful planning and coordination, dedicated support, comprehensive training, and a broad communications campaign to drive user awareness and adoption. Replacing a highly personal productivity tool such as e-mail posed a dramatic cultural shift for users, particularly the 30 percent population of UNIX/Linux engineers.

Compelled by these challenges, Cisco broadened its vision by choosing Exchange for integrating messaging with its Unified Communications and MeetingPlace products. In partnership with Microsoft and EMC, Cisco created a highly-reliable and redundant architecture using a standardized system that could be scaled to support its growth and global complexity. Leveraging the service-oriented network architecture (SONA) model, Cisco developed an innovative Exchange security design with Cisco Secure Sockets Layer (SSL) services on the network layer rather than the host. Likewise, Cisco used its CSM routing/load balancing network module to virtualize e-mail routing by providing one domain address on the mail client, thus eliminating manual changes on the desktop. To maintain its commitment to the UNIX/Linux community, Cisco IT used Novell Evolution, Mozilla, and Microsoft Outlook Web Access to support a heterogeneous client environment.

“Cisco messaging architecture showcases the foundation for enterprise collaboration and mobility solutions at Cisco, including audio/Web conferencing (MeetingPlace) and wireless/mobile e-mail and calendaring access,” says Carina Reyes, Cisco IT worldwide Enterprise Messaging Services manager. See Figure 1-1 for details.

Figure 1-1: Establishing the Foundation at Cisco



"This implementation reflects the long-term commitment of Cisco to deliver an end-to-end architecture for the convergence of voice, video, and data across its own network. In addition, the Global E-mail and Calendar Program is consistent with the long-term Cisco goal of converging unified messaging with IP telephony to form an IP Communications solution."

By September 2005, Cisco had accomplished one of the largest migrations to Exchange, transitioning 40,000 mailboxes over 16 weeks, while maintaining a weekly 4.6/5.0 case average satisfaction score. The program strategy, effective training and support, award-winning communications, and world-class project management led to an unexpected 80 percent weekly migration rate—50 percent above target—and a seamless switch to Exchange calendaring over one weekend.

Cost savings, employee satisfaction, stability, and alignment with company strategy had immediate payoffs. The speed of migration avoided $500K in outside service costs and $800K in legacy license fees. Between the reliability of its design and Coyote Creek's effective managed service, messaging availability improved from 99.4 to 99.99. The post-migration caseload dropped 20 percent below its pre-migration level, and continues to trend down. In a June 2006 survey, e-mail and calendaring—the lowest-rated IT services in 2003 at 66 and 34 percent—received 83 and 82 percent satisfaction ratings, finishing second and third overall. The new messaging platform enabled the implementation of 13,000 global mobile messaging phones, and integrated calendaring and e-mail with Cisco MeetingPlace, a one-stop scheduling solution with Web/audio conferencing options. With the foundation solidly in place, Cisco can now extend its service offerings with innovative, rich collaborative services.

Business Value

The most important benefits derived from the Global E-mail and Calendar Program are as follows:

- Enterprisewide calendaring—the new architecture enables calendaring across enterprise time zones for group scheduling, global conference room scheduling, and corporate events scheduling.
- Integrated calendar, mail, contacts, and tasks—these functions can be "mixed-and-matched" in the new solution.
- Establishment and enabling of a foundation framework for converging collaboration and communication systems—Exchange becomes the conduit for scheduling and e-mail integration, and for reserving voice conferencing and video conferencing bridges for any meeting, thus allowing Cisco to use other unified communications tools as they become available.
- Replacement of a fragmented and inefficient e-mail and calendaring system—even a modest savings of ten minutes a day in employee productivity can translate into millions in savings for a large global enterprise.
- System scalability—problems with the scalability of legacy systems were resolved with the migration to Exchange, thus enhancing system performance and stability.
- Increased messaging security—this solution provided an additional defensive layer with an antivirus checkpoint. Every Exchange server has third-party software installed on it with options for blocking certain attachments.
- Increased system-level and process efficiency—the new system did not require e-mails to be replicated to different systems, and users could access a global calendar without needing multiple accounts and schedules in different servers.

Background

This section describes the legacy e-mail and calendar issues, as well as early attempts to deploy Exchange globally.

Legacy E-mail Messaging Infrastructure

The legacy solution for sending and receiving e-mail within Cisco consisted of a central core of UNIX mail servers and Sendmail for the management of e-mail. This core is a series of UNIX servers networked together, with gateways accessed through firewalls to the Internet at key locations.

The legacy e-mail messaging infrastructure, excluding the deployment to European and Emerging Markets, is described in the following table:

E-mail System	Function
SendMail	SendMail e-mail messaging system, using five HP UNIX and 11 Sun/Solaris servers and sendmail MTA open source software provided services to approximately 80 percent of users.
Mirapoint	Sixteen Mirapoint messaging appliances supported Web-based e-mail or any standards based e-mail client such as Outlook; provided services to approximately 15 percent of users, mostly engineers.
Microsoft Exchange Server 5.5	Deployed to an 800-user site in Australia and about 100 users in San Jose, California.
Rogue Microsoft Exchange	Several Exchange servers were installed in various locations using shadow IT support.
Microsoft Outlook POP clients	Between 40 and 50 percent of the e-mail clients used Microsoft Outlook as a POP client.
Other clients	UNIX and PC clients were using various other e-mail options such as Netscape Messenger, mutt, pine, and Qualcomm Eudora.

Legacy Calendaring Issues

As Cisco became a large-scale global company with over 40,000 users, it outgrew its enterprise calendaring system. This led to problems with propagation and support of multiple time zones. The following problems were the most visible ones:

- New users had to be added manually, since there was no flow from the HR database. There were no connectors to Active Directory or Lightweight Directory Access Protocol (LDAP).
- For conference rooms to appear in Meeting Maker, they had to be added manually by an administrator from a central location.
- Because of heavy usage and due to the scaling problem, capacity was an issue in the United States, especially in San Jose. When a server was full, users were moved between servers, making it very inconvenient.

- The historical data had to be purged quarterly because Meeting Maker could not hold more data. Users could export data to a text file, but the data could not be re-imported. The manual purge took an entire weekend to complete.
- Frequently when a user created a meeting and invited people who were not on the same Meeting Maker server, it would take two hours to a day to get their invitation. If the users were all on the same server, this was not a problem.
- Users requiring global calendaring—for example, for meeting with people in multiple regions—needed multiple accounts and schedules in different servers because the calendar servers in different regions were not connected with each other, which was very inconvenient and problematic.

Early Attempts to Deploy E-mail and Calendar Globally

Prior to the start of the actual Global E-mail and Calendar Program, several costly and unsuccessful attempts had been made by different groups at Cisco. The early attempts suffered from a lack of cohesive program. The right technology, process, and resources were not applied.

The turning point came when an executive sponsor at the CIO level was assigned and proceeded to restructure the program as a single initiative, with global ownership, global budget, a business sponsor, a direct manager, and an owner. A decision was made to pursue a get-well plan for the European and Emerging Markets and rebuild as needed. This case study only documents the last, and by far, the largest phase of the E-mail and Calendar migration, after E-mail and Calendar migration in European and Emerging Markets had been completed.

European and Emerging Markets Exchange 2003 Deployment

The Exchange 2003 deployment to European and Emerging Markets was a significant event for the Global E-mail and Calendar Program. Achieving a successful migration convinced management that the Global E-mail and Calendar Program was technically feasible. It validated the global migration strategy and gave the team valuable insight for addressing the challenges of a global migration.

Although the early migration ran into several problems with stability and performance, upgrading to Exchange 2003 and Outlook 2003 resolved 90 percent of the performance issues that users had experienced with Exchange 2000 and Outlook XP.

Challenges

The legacy e-mail and calendar infrastructure issues and the large scale of the program posed many challenges for a global e-mail and calendar migration:

- Every single employee at Cisco uses these applications dozens of times a day—that is, every user at Cisco that has a mailbox.
- Cisco employees were very much used to the applications that they had chosen and had used for years.
- There were already several rogue Exchange and e-mail servers set up within Cisco, outside of Cisco IT control.
- Almost all e-mail and calendaring data was stored in two different locations—80 percent on Direct Attached Storage (DAS) and 20 percent on a Storage Area Network (SAN)— making storage unreliable.

- There were many heterogeneous e-mail clients such as UNIX, Linux, Mac, and Microsoft Windows, and employees felt strongly about the advantages of each.
- There were disparate systems for security management, which could not be consolidated until a cohesive messaging solution was implemented.

To address these challenges, Cisco built a dedicated global organization committed to tackling each of these challenges. For example, a separate UNIX/Linux track team focused on the large engineering community of UNIX and Linux users and developed specialized tools for their migration.

Global Mail and Calendar Program Organization

The Global E-mail and Calendar Program was implemented by a global cross-functional team with members chosen for their expertise in the various disciplines and functions needed to further the initiative. In addition to the Program Manager, the Global E-mail and Calendar team was divided into the following tracks, each having its own lead and representing a major program deliverable:

Track	Function
Design and Engineering	Defined functional requirements, developed architectural solution, and managed site deployment.
Communications	Developed strategy for disseminating information about changes to users through various media, and also worked closely with Training and Client Support tracks to manage and deliver consistent and timely communications.
Messaging Migration	Managed the client migration automation, scheduling, and client communications. Each region had its own local project manager under a global messaging program manager.
Calendar Cutover	Managed Meeting Maker cutover, which included coordination with WPR (Facilities) to populate the global address list with official conference room data and related training and support.
Automation/Tools	Focused on process automation—such as the Client Migration Management (CMM) tool and back-end processes—migration status tracking, and overall integration with IT infrastructure.
UNIX/Linux Track	Focused on addressing the e-mail and calendaring needs of the large community of UNIX and Linux platform users, including developing tools, performing functional testing, and providing support.
Training Track	Worked closely with the Communications group to develop the strategy and the courses to support the client migration, the Outlook e-mail and calendaring features, and the calendar cutover. The group developed schedules for training different levels of user.
Support and Operations Model	Included overseeing operational support of the Exchange infrastructure. Managed the support of all users during the client e-mail migration and the calendar cutover. Handled Vendor Management Office (VMO) contract negotiations with hardware and software vendors such as Microsoft, and HP, as well as outsource vendors.

E-mail and Calendaring Solution

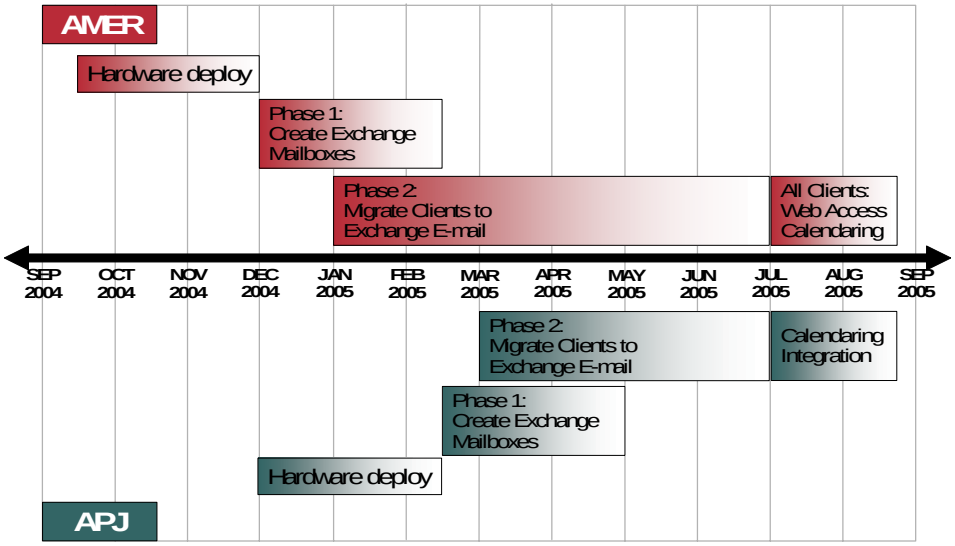
This section describes the deployment strategy and the new e-mail and calendaring solution. For a detailed list of the new e-mail and calendar features, see "New Feature Functions and Benefits for Users" on page A-6. For a description of the new e-mail and calendar policies, see "E-mail and Calendaring Policies" on page A-2.

Deployment Strategy

Global E-mail and Calendar Roadmap

Figure 1-2 illustrates the Global E-mail and Calendar Program milestones.

Figure 1-2: Global E-mail and Calendar Program Roadmap



Deployment Site Consolidation (Design)

Originally 11 global sites were considered, but the Exchange deployment was consolidated to only five sites, which greatly simplified the project logistics.

The original site placement criterion was based on Outlook XP "offline mode," requiring less than 300 to 350 millisecond (ms) latency. Latency is the most critical factor regarding performance acceptable to end users. The following considerations were taken into account for revising the site placement:

- Outlook 2003 "cached mode" is much less sensitive to latency than Outlook XP "offline mode," yielding acceptable e-mail performance over links with up to 1-second latency, which reduced the number of server sites needed.
- The two sites in the European and Emerging Markets could be consolidated to one in Amsterdam, because no "edge" site exceeded the 500 ms latency to Amsterdam.

- The five Asia Pacific sites could be consolidated to one site each in Hong Kong and Bangalore, because Asia Pacific has a redundant WAN topology that provides continued service availability.
- The deployment to European and Emerging Markets validated the viability of a centralized site design with a network latency (1 second end-to-end) design boundary.
- Budget savings for Asia Pacific site reduction were $615K Capital Expenditure.
- The consolidation simplified and reduced deployment and sustained support costs.
- The consolidation shortened production startup lead-times (fewer sites to prepare and set up).

Data Center Deployment

The new Exchange servers are arranged in clusters called “pods” and use a common Global Addressing List (GAL) that allows employees to use a local account for e-mail and calendar, yet view all employee and conference room free/busy schedules across geographies. The Pods are a centralized collection of Domain Name Servers (DNS), Distributed Director Exchange mail and storage servers, Active Directory domain controllers, and CSS switches—distributed worldwide. Users need only one Exchange account to schedule meetings with employees and conference rooms across the geographic Pods.

After the migration, e-mail and calendaring services were all handled through Exchange servers that were deployed in pods at five global sites, as follows:

- San Jose, California
- Research Triangle Park (RTP) in Raleigh, North Carolina
- Amsterdam
- Bangalore
- Hong Kong

New Flexible E-mail Environment

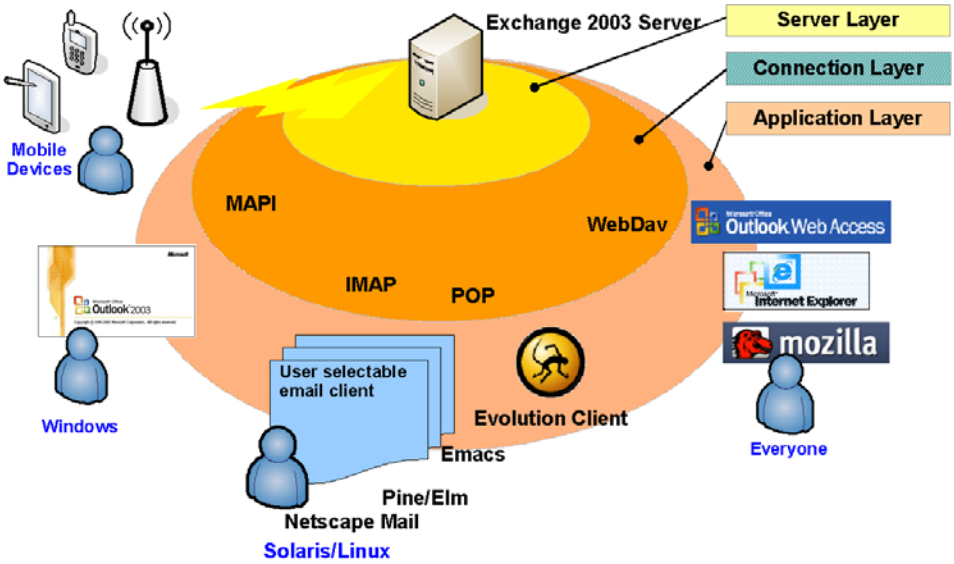
At Cisco, e-mail is highly used and considered by employees as a very personal application. The Global E-mail and Calendar Program team specifically designed the Exchange implementation with e-mail flexibility to allow users to select their preferred e-mail client application.

After the client migration, users were able to manage their e-mail with Microsoft Outlook 2003, Novell Evolution, or Microsoft Outlook Web Access (OWA) within a Microsoft Exchange 2003 infrastructure. Users could now exploit Exchange collaborative features globally—for example, shared contact folders, information sharing, tasks, and user-defined mailbox access. The biggest adjustment after the migration was becoming familiar with the new IMAP/POP and other client/server and shared resources environment.

The Cisco e-mail architecture offers both Exchange and non-Exchange-based e-mail delivery. Windows-based users have access to an Exchange/Outlook 2003 combination that provides a completely integrated e-mail and calendar solution. For Linux and UNIX platforms, users have a choice of e-mail delivery methods and can access the global calendar with either Novell’s Ximian Evolution client or with a Web browser and Microsoft OWA.

Figure 1-3 illustrates this flexible strategy.

Figure 1-3: New Flexible E-mail Environment



Exchange 2003 allows Windows users to choose their preferred e-mail application and connection method, as shown in the following table. Outlook 2003 users are recommended to use MAPI.

E-mail options	Connection Method	Comments
Microsoft Outlook 2003	MAPI	• Maximum level of e-mail functionality • Maximum level of calendaring functionality • Future Unified Messaging and MeetingPlace integration
Microsoft Outlook 2003	IMAP/POP	• Not recommended
Netscape Messenger v7.0 or Mozilla v1.6	IMAP/POP	• Must use Outlook 2003 or OWA for calendaring and Out of Office • Requires server-side rules for calendaring notifications
Qualcomm Eudora	POP	• Not recommended • Availability and support of Eudora reaching its end-of-life

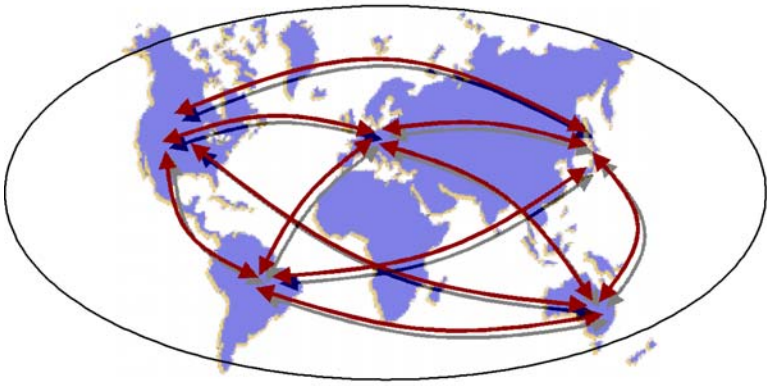
Exchange 2003 allows UNIX and Linux users to choose their preferred e-mail application and connection method, as shown in the following table. Users should consider the calendaring implications when selecting their e-mail application of choice.

E-mail options	Connection Method	Comments
Netscape Messenger v7.0 or Mozilla v1.6	IMAP/POP	• Must use OWA for calendaring and Out of Office
Pine	IMAP/POP	• Must use OWA for calendaring and Out of Office
Microsoft Outlook Web Access (OWA)	via Netscape Messenger v7.0 or Mozilla v1.6	• No server-side rules available • Includes calendaring functionality • Basic level of e-mail functionality
fetchmail/procmail	IMAP/POP	• Must use OWA for calendaring and Out of Office
Novell Evolution 1.4 on Cisco Linux 4.30-3 +	Microsoft Exchange Connector	• No server-side rules available • Interface is similar to Outlook • Integrated e-mail/calendaring

Global Calendaring

The largest payback from the E-mail and Calendar migration was the ability to provide a truly global scheduling capability for the first time at Cisco (see Figure 1-4). Because all users access the same global infrastructure and client software can translate time zones, scheduling of international events and meetings was vastly improved. It was far more stable than the legacy calendaring system and provided a richer feature set that enhanced collaboration from the outset.

Figure 1-4: Exchange Global Calendaring



Exchange Calendaring allows employees to use one account to schedule meetings with any employee or conference room in any geography.

New Exchange Calendaring Applications

After the cutover, the following Exchange calendaring application options were available to users:

Application	Supported OS	Description
Microsoft Outlook 2003	Microsoft Windows	Outlook 2003 provides the most functionality; benefits are as follows: • Calendars are displayed side-by-side, including the user's own calendar, meeting room calendars, and shared calendars. • Calendars scroll together, and are color-coded and labeled to allow quick comparison. • Free/busy data is updated automatically when users change their calendar or log out of Outlook, or every 15 minutes while they are logged in. • Two months of free/busy data is always available (user can adjust timeframe).
Novell Evolution	Linux	Novell Evolution emulates a variety of Microsoft Outlook functions on the Linux platform.
Microsoft Outlook Web Access (OWA)	UNIX, Linux, and Microsoft Windows	OWA provides a few Outlook 2003 functions, such as multicalendar display, but it has the least functionality of the three applications.

Results

Sixteen weeks from the beginning of the migration, most of the 50,000 Cisco employees had migrated successfully to Exchange. The project was completed by the middle of July, nearly 30 days ahead of schedule, even though the start date had been delayed by more than a month.

After the initial deployment of MeetingPlace 5.3 in early 2006, Cisco employees discovered how easy it was to integrate e-mail with meetings and meetings with conferencing bridges and shared desktop applications.

Support Case Loads

Support case loads were lower for the quarter following the migration than for the quarter preceding the migration (37 percent fewer e-mail cases and 64 percent fewer calendaring cases), while customer satisfaction was very high (4.7 out of 5.0) during the migration.

IT Messaging Survey

Two customer surveys were conducted after the migration. The first survey was conducted in January/February 2006 to measure the level of satisfaction with the new messaging services, identify user concerns, and gather information for future enhancements. The survey was sent to 5000 users randomly selected from different organizations, and 32 percent (nearly 1600) responded: engineering (33 percent), customer advocacy (17 percent), sales (13 percent), marketing (11 percent), IT (5 percent), and other (21 percent).

The following data was obtained from the February/January 2006 survey:

- Eighty percent of respondents spent more than 25 percent of their workday doing e-mail.
- Ninety percent of respondents used Outlook 2003 to manage e-mail, and 92 percent used it to manage calendaring.
- E-mail satisfaction was 71 percent (excluding 17 percent neutral), and calendaring satisfaction was 64 percent (excluding 20 percent neutral).

  Note: Additional optimization and enhancements are planned to address specific issues with calendaring.
- Fifty-five percent of respondents received e-mail and calendar training during the migration; of these, 90 percent felt that the training was useful.
- Ninety percent of respondents were satisfied with e-mail support, and 89 percent were satisfied with calendar support.

IT Services Client Satisfaction Survey

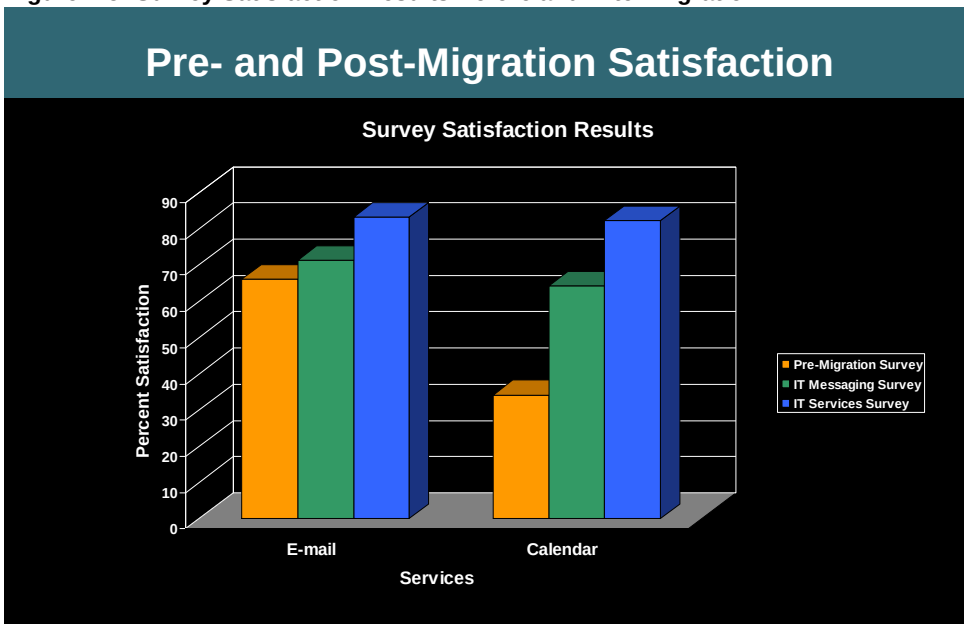
Another survey, conducted in June/July 2006, measured the level of satisfaction with all IT services. This survey was sent to nearly 17,000 employees worldwide, and 12 percent (over 2000) responded. The top five contributors were, in order of participation: sales (52 percent), IT (13 percent), engineering (12 percent), customer advocacy (12 percent), and other (11 percent).

Messaging services received the second and third highest levels of overall satisfaction in the IT 2006 survey. The results were as follows:

- E-mail services: 83 percent (excluding 9 percent neutral)
- Calendar services: 82 percent (excluding 11 percent neutral)

Figure 1-5 compares both post-migration survey scores to the results of a 2003 survey, where satisfaction was 66 percent for e-mail and 34 percent for calendaring.

Figure 1-5: Survey Satisfaction Results Before and After Migration



Program Management Leadership Lessons

This section describes the lessons learned by the Global E-mail and Calendar Program manager.

Implement a Unified Approach under Strong Leadership

A unified global approach was essential for tackling a project of this magnitude and criticality. Consistent leadership, strong executive sponsorship, and a single cohesive and dedicated team and budget were essential to the success of the project. “Management sponsorship is a lever on the speed of execution,” says Teh Cheng, Global E-mail and Calendar Program manager. “When key decisions need to be made, availability, accessibility, and support of the managers and executive sponsor can significantly speed up or slow down project delivery.”

Empower and Trust in your Team

Fostering the right work environment for the team boosted morale and improved team dynamics significantly. This approach allowed management to understand the real problems and enable team members to make qualified decisions. For such a large project, it is essential to have a functioning team and to trust in the team. By being nonjudgmental and by trusting team members to make decisions on their own, the program manager sends a strong message that people’s ideas are worth listening to, helps develop the decision-making skills of team members, and empowers them to work together as a unit.

Communicate Adequately Trade-offs and Progress

It is important for the program manager to build integrity, trust, credibility, and exert influence both informally and formally (through directives). Daily minute-by-minute dialog fits under the basic skills of project management. The project manager should guide the dialog but not dominate it. The program manager must help ensure that the team members understand the trade-offs during internal dialogs: what the decision will cost; what they will have to give up; what they will get in return. The program manager should recognize what is not working right in order to move forward. Also, the program manager must focus on the weekly tangible project progress that leads to the milestone, since the project will be built up piece by piece. At some point the project manager will turn a corner and realize that a major change has taken place.

Manage Both Upwards and Downwards

"The program manager must be a buffer between the team and upper management and users," says Teh Cheng, Cisco IT Global E-mail and Calendar Program manager. "These dual roles can sometimes be conflicting, since the program manager has to manage both upwards and downwards. The program manager manages the dynamics, the tension, and the communications within the team and management, as well as between the team and its clients. It is essential for the direct manager and the program manager to partner tightly with the team, so that team members know that they are well supported."

Formalize Change Management and Control

At the beginning of the actual migration, a change management process was put in place. Changes were documented and approved through a well-advertised control process. Before a change could be made, the managers affected had to agree on it. The change management process applied to everyone involved in the project, both team members and management and was stored in a collaborative area for all team members to update and review. The change management was important to guarantee quality control throughout the deployment and to resolve control issues that had plagued previous migration attempts. The change management process gave the team a degree of control over incoming changes. Before this, changes were approved in an unplanned manner. An approval process helped ensure that the budget was kept under control and that changes were approved by the right people and communicated adequately to those who needed to be informed.

Have Fun

A good gauge of the health of your team is how much fun the members are having. During the last phase of the deployment, everyone was excited because much progress was being made. The team had enough confidence; they knew that poor decisions could be cleaned up later. The team members enjoyed the project, team events, and doing their job. There were differences of opinion, but these were healthy, positive debates. Team members adopted decisions instead of fighting decisions.

MODULE 2

Leveraging the IP Network on a Global Messaging Architecture

Content

Background

This case study module describes the architecture and engineering solution behind the Cisco IT migration to Microsoft Exchange Server 2003 within the Cisco global network. The fundamental principles outlined here allowed for the design of a high-reliability solution that handles over 12 million e-mails (10 million internal and 2 million external) a day and calendaring for over 50,000 users globally.

After a long investigation of different integrated platforms, Cisco IT selected Microsoft Exchange to support both calendaring and e-mail, and to integrate with new Cisco collaboration tools. The major challenge that Cisco IT would need to overcome, before migrating calendaring and e-mail to Outlook, would be to design and deploy a global Microsoft Exchange platform. This was the first step required in building a global and cross-functional team to architect and engineer the Exchange solution.

Design and Engineering Track

The Design and Engineering track was assigned to define a scalable, reference architecture for the Global E-mail and Calendar migration. The Design and Engineering Track team had the following responsibilities:

- Defined the functional requirements
- Developed the architectural solution
- Managed site deployment of Exchange servers and other hardware and software

Challenges and Opportunities

The e-mail and calendaring infrastructure at Cisco had evolved over the years to meet the practical demands of a rapidly growing business. The solution was not an integrated design and was starting to reach limits of scalability. With increasing globalization, it was recognized that e-mail and calendaring utilities would become increasingly stressed and that an integrated solution with capacity for growth was required.

Cisco had previously undertaken a partial implementation of Exchanger Server 2000, which supported over 7000 users. This implementation enabled the design and engineering to be tried and developed. In addition to providing valuable experience in the scaling of Exchange Server, this execution and operation highlighted some issues with Exchange Server 2000.

The most significant challenges that Cisco had identified were as follows:

- “Multiplatform Support” on page 2-3
- “Need for Integrated Calendaring” on page 2-3
- “Behind-the-Scenes Design Challenges” on page 2-3
- “Global, Robust Active Directory Infrastructure” on page 2-3
- “Consolidated Data Storage Infrastructure” on page 2-4
- “Standardization of Facilities (WPR) Information for Calendaring” on page 2-4

Multiplatform Support

Part of the business challenge was to consolidate disparate solutions while helping ensure full provision and support for the multiplatform user environment that exists within Cisco. To meet this need, custom Web-based applications that integrate into the Exchange Server environment are used.

Need for Integrated Calendaring

A major reason for using Exchange Server 2003 was for the provision of integrated calendaring. The existing calendar systems within Cisco had the following drawbacks:

- Time zone conversions—a critical element when vertical global management is used
- Lack of scalability
- Disparate solutions
- Inability to integrate localized databases to create one global resource
- Need to minimize high costs and risks associated with the use of shadow IT (use of nonstandard IT resources to bypass systems)

Behind-the-Scenes Design Challenges

The following design-related issues needed to be addressed also:

- Operational automation
- Backup/Recovery speedups
- Business continuity plans
- Disaster recovery investigation
- Team calendaring
- SOX and Cisco security compliance
- Quotas
- Site placement
- Integration with UNIX core
- Virus and spam protection
- Future technologies convergence integration—MeetingPlace®, Mobility, and Unity integration

Global, Robust Active Directory Infrastructure

The ability to quickly access quality information in Active Directory significantly enhances the performance of Exchange Server. Active Directory is an information repository that underpins the Microsoft Windows operating system and includes user details, such as name, e-mail address, preferences, and applications.

Before the Global E-mail and Calendar migration proceeded, Cisco had implemented a robust, reliable global solution for Active Directory with the following characteristics:

- Enhanced performance by having the Active Directory servers immediately adjacent to the Exchange servers
- High volume and cached lookup for Active Directory
- Redundant domain controllers for each region of operation
- Rapid update and replication of Active Directory

Consolidated Data Storage Infrastructure

"Part of the Exchange Server 2003 implementation was recognition of the need for consolidated data storage," says Matt Runyan, Cisco storage expert. "To allow for unified messaging and access to e-mail from anywhere, data and information cannot be locked away on a desktop computer. Data needs to be stored in consolidated repositories." The adoption of distributed computing power was a good outcome but the loss of consolidated data storage has been a detriment to the business. The move to consolidated data storage underpins many of the activities at Cisco, and the Exchange Server 2003 implementation was one of the tools used to realize the change to consolidated data storage.

Consolidated does not mean centralized and the single source of failure that this implies. Consolidated means that data is not locked away locally where data is inaccessible.

Standardization of Facilities (WPR) Information for Calendaring

The calendaring function needed to have an accurate list of all the people and a list of all the conference rooms available within Cisco that people could request for future meetings. Active Directory is a read-only repository that can only accept user and conference room data from Human Resources (HR) and Workplace Resources (WPR) source databases. The Active Directory data has to feed directly from HR or WPR databases in order to provide accurate calendaring and resource reservation.

Before the migration, there were multiple conference room databases maintained by WPR. Some of the data was incorrect. Some rooms had been taken offline and although visible could not be booked as first-come-first-serve. To book these rooms a user had to submit a proposal to the room proxy.

Because WPR did not have a single database with all the facilities in it, room objects such as conference and training rooms needed to be added to the WPR database before Exchange was deployed. One of the prerequisites for the migration was that WPR data be stored in the Active Directory prior to deployment. The lessons learned in the European and Emerging Markets e-mail and calendar migration were valuable for this effort.

Solution Design

The design included a series of eight pods, in five locations around the world, housed in Class-A Data Centers. A Class A center must be climate-controlled and have redundant power and networking, have sufficient weight-bearing structure, and have a secure physical access. Each pod contains up to 21 standardized servers, including e-mail and infrastructure servers, to support over 11,000 users per pod. Hardware redundancy and data backup exist at several levels including hardware commoditization and tapeless backup. Disaster recovery incorporates quality-assured operational procedures and redirection of user mailboxes. Integral to the design is the use of storage area network (SAN) capabilities and the separation of operational servers (running the operating system and required applications only) from data storage and archiving.

The existing core infrastructure of UNIX servers and Sendmail was kept. In addition to being cost effective, this setup provides multiple points of execution for outbound e-mail. Utilization of this core infrastructure avoids the problems of a single point of

failure and poor delivery from a single point of execution inherent to many Exchange Server implementations.

Design Considerations

"The key design consideration was the need for an extra-strength (scalable, reliable, and with built-in redundancy) solution for e-mail and calendaring," says Ron Powell, the design and engineering project manager. "E-mail and calendaring were considered as utilities, like the power grid. These goals were achieved by using a simple solution that could be readily deployed and maintained." Reliability was achieved through standardizing all aspects of the solution, minimizing the complexity of the solution, and having many simple servers that work well. In addition to providing reliability and scalability, the solution is easy to deploy and maintain and is cost effective.

This section details the design considerations for the Cisco implementation of Microsoft Exchange Server 2003. The business case and supporting business considerations of the solution are not included here. Some of the many considerations that came into play when designing the solution are as follows:

- Experience gained from the Exchange Server 2000 implementation
- Recognition that there are few, if any, implementations of Exchange Server 2003 on this scale in the world that can be used as a guide
- Leveraging the successful high-reliability implementation of Active Directory at Cisco
- Complexity of integrating existing in-house applications with the Exchange Server 2003 environment
- Realization that, as systems become more complex, more points of failure exist and that to have the most advanced does not always align with the ability to deliver

The ability to manage expectation—aligning short-term needs with the strategic solution and differing advice from competing sources—were all issues that influenced the design. One of the major advantages achieved, however, was to objectively design the best technical solution and then manage the implementation around this solution to provide a high-reliability infrastructure that delivers.

Key Concepts

To appreciate the architecture and engineering of the Exchange Server 2003 solution, the following key concepts should be recognized:

- E-mail and calendaring are not an IT solution; they are a business utility. The solution needs to be designed and implemented from this perspective.
- The solution is a high-reliability assembly line for the handling of e-mail and calendaring. That is, each part does its bit to create an overall solution. In other words, one part cannot be everything to everybody.
- Quality assurance (QA) was applied to each step of the process with integrity of handoff along the production line, in order to help ensure QA of the overall solution.
- Proven high-reliability solutions are purposefully engineered to help ensure delivery both now and in the future. Recognition of this principle was critical to the Cisco implementation.
- The solution needed to be kept simple and minimize the points of failure. In other words, complexity was to be avoided.

- Standardization was needed across all aspects of the solutions to lower costs and and help ensure service delivery, not only to the user but to those in the project.
- It was necessary to leverage the existing infrastructure where possible.
- It was essential to separate operational servers—running the operating system and required applications only—from data storage and archiving.

Standardization

The benefits of standardization include lower costs, reliable service delivery, and the ability of people to duplicate the solution, to manage the solution, and to keep things simple. The recognition of the importance of standardization has been one of the keys to the success of the Cisco implementation. Standardization was used in many aspects including

- Naming conventions
- Configuration
- Hardware specification
- Hardware deployment
- Operational environment
- Build process
- Testing procedures for each aspect of the solution

By standardizing every aspect of server design, servers can be readily deployed, replaced, and swapped. In addition, standardization minimizes the extent of training required and reduces maintenance.

Reliability

The ability to receive and deliver over 12 million e-mails a day means that the solution must be reliable. Reliability is obtained as follows:

- Housing servers in a Class-A Data Center, either on or off site
- Using proven hardware configuration
- Having a spare server in each pod to assume the role of any server that failed
- Minimizing the software used and its complexity
- Using many small commoditized servers
- Adopting a proven multipath disk system for storage that utilizes Cisco MDS range of Director Class SAN switches—a SAN is a high-speed subnetwork of shared storage devices
- Providing redundant front-end servers to support non-Microsoft Outlook mail clients
- Separating mailboxes from other mail-related functionality
- Distributing the mail process across process-specific servers
- Minimizing the complexity of each server

Scalability

The Cisco mail server infrastructure deployed was designed to be scalable. That is, it could quickly and easily accommodate increasing numbers of users performing more complex tasks. Scalability was achieved as follows:

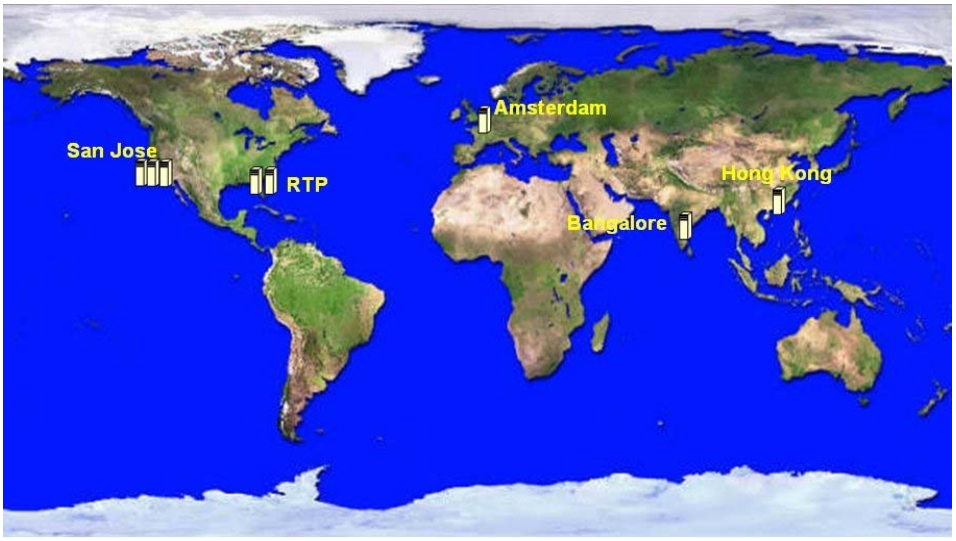
- Setting each server to about 60 percent load capacity

- Using the same hardware platform for all server roles globally (such as front-end, bridgeheads, mailbox, free/busy)
- Retaining the ability to oversubscribe servers with users
- Using up to 14 mailbox servers per pod
- Supporting ready addition of extra servers and storage to support additional users
- Limiting the number of users to 800 per server (11,200 per pod)

"Additional scalability is achieved at large sites by having multiple pods associated with them," says Nick Martin, the key Cisco designer. "For example, three pods for the Cisco headquarters at San Jose and two pods for RTP (Research Triangle Park). One pod is currently sufficient for the other locations."

Figure 2-1 illustrates the global location of the pods.

Figure 2-1: Location of the Exchange 2003 pods



Redundancy

The built-in redundancy capacity is tied in with reliability and scalability. Like a power grid, service delivery is made more reliable through redundancy and by *avoiding* having everything operating at capacity. The use of many small, simple solutions, operating below load capacities (typically 60 percent of capacity), is fundamental to reliable service delivery. Furthermore, one solution does not address all situations. The best solution in one area does what it is best at and is combined together with other solutions to deliver the required result.

Leverage of Existing Infrastructure

Cisco already had a proven and high-performance mail server infrastructure in place. On cost consideration alone, there was no point in redesigning or replacing this core infrastructure. In addition, this setup provides multiple points of execution for outbound and inbound e-mail, resulting in increased performance and avoiding a single point of failure.

Antispam and Antivirus

To effectively and efficiently meet the threat of computer viruses and spam attacks, Cisco has adopted an approach that is analogous to that used in mission-critical systems such as airline guidance and control systems: assume failure will occur but put in place solutions to mitigate disaster. This approach is summarized as follows:

- Scan e-mail coming in from the outside world but also scan internal e-mail.

  Note: Security structures often assume that the data is secure inside the corporate defense perimeter. Scanning internal e-mail adds further defenses and allows protection against internal threats—for example, data from floppy disks and mobile devices.

- Bring together the best solution in each area, but let each one do what it does best.
- Recognize that points of failure will occur, but help ensure that multiple instances of failure do not align.
- Provide a layered approach to mitigate the risks associated with points of failure.

Networking

The implementation of Exchange Server 2003 adopted by Cisco does not require any specific networking considerations other than sufficient bandwidth to support the operation. To optimize the solution, provision for redundant network paths is provided through the use of the appropriate cards in the servers. Out of band management consoles (cards) are also present in the servers.

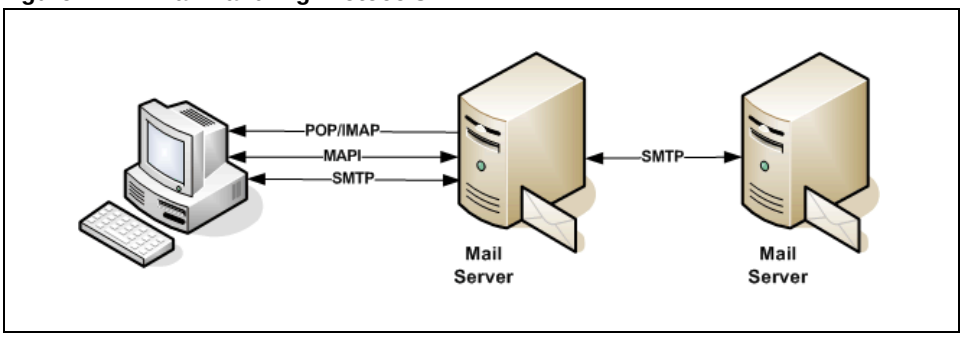
Solution Architecture

This section details aspects of the technical solution for the Cisco implementation of Microsoft Exchange Server 2003. The section presents details on the pod design, hardware, and software and discusses the importance of the SAN infrastructure.

E-mail Handling

A simplified view of the protocols used within Cisco for handling e-mail is shown in Figure 2-2.

Figure 2-2: E-mail Handling Protocols

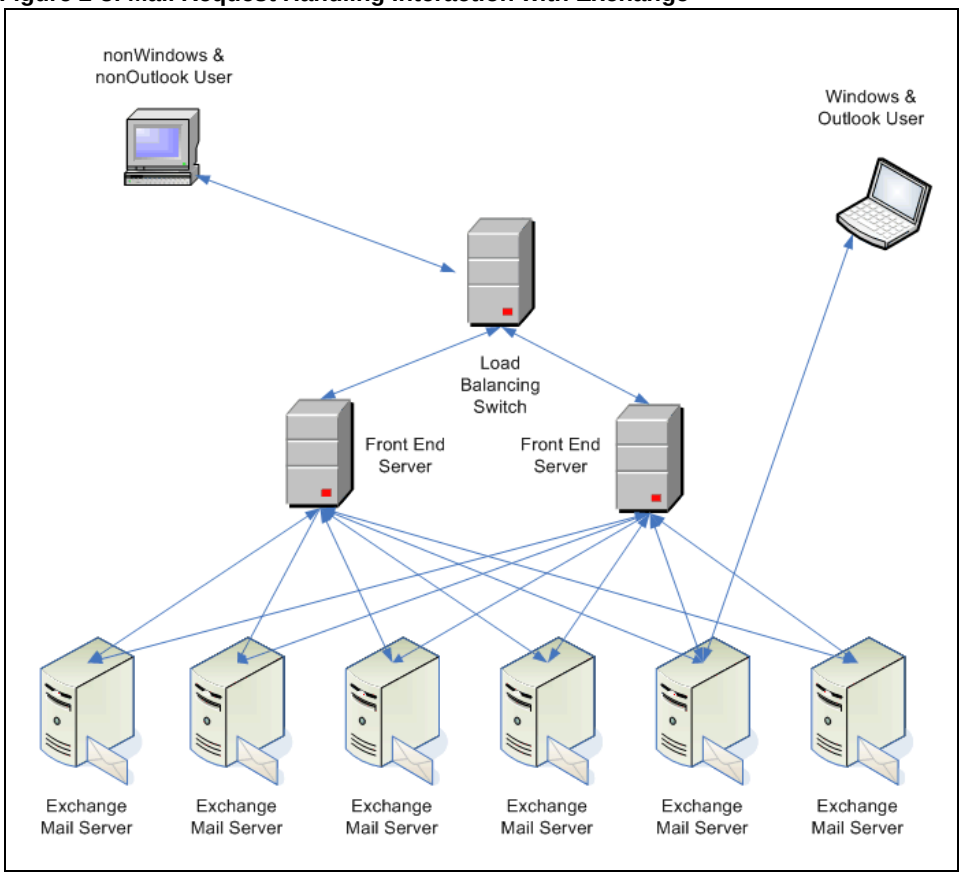


From the user's desktop or laptop computer, outgoing messages are forwarded to a mail server using Simple Mail Transfer Protocol (SMTP). E-mail to other mail servers is also routed via SMTP. The receiving of e-mail on the desktop is via either point-of-

presence (POP) or Internet Message Access Protocol (IMAP). Messages can also be sent back and forth using Mail Application Program Interface (MAPI). Although other protocols may also be used and the process may be more complex than depicted, this illustration is sufficient for discussion purposes.

Mail request handling and the interaction with the mail servers is illustrated in Figure 2-3. Requests for mail and calendaring services from Outlook users on the Windows operating system are handled directly by sending a request to the appropriate Exchange server. Non-Windows users connect to the Exchange environment to the front-end servers through Distributed Director.

Figure 2-3: Mail Request Handling Interaction with Exchange



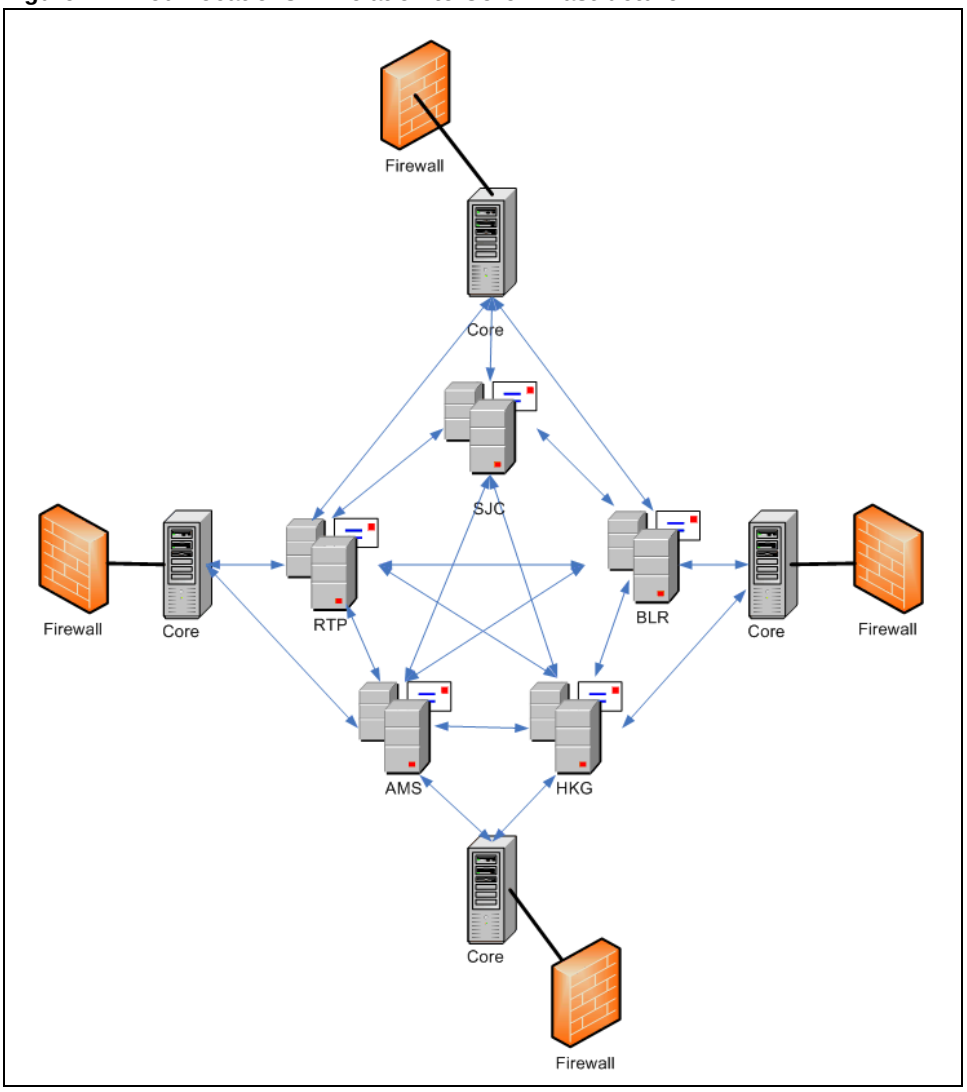
Message Core Design

"The UNIX Message Core (UMC) was part of the legacy e-mail messaging system." says Ron Powell, design and engineering project manager. "The UMC consists of three unique server types: an antispam and antivirus appliance, a mailing list automation appliance, and an e-mail authentication server. The UMC advantages were significant. The UMC was optimized to handle message queuing much better than Exchange. In addition, the automation for handling inbound and outbound traffic as well as mailing list automation, is built on the core. It was decided that we should use the UMC core in the new architecture, so that we could make use of the automation and optimization processes rather than have to redesign them."

Exchange and Message Core Interaction

The relationship between the UNIX message core and the Exchange Server 2003 infrastructure is illustrated in Figure 2-4, which shows the five Exchange pod locations in relation to the core infrastructure. The core, consisting of UNIX servers operating Sendmail, has access to the Internet through the firewall at many points, helping ensure ready access for each geographic location. Each of the Exchange pods interacts with the other pods and with the core for sending and receiving e-mail. There is no one central point or hub for controlling the pods; rather, the pods are meshed together to create one virtual e-mail server.

Figure 2-4: Pod Locations in Relation to Core Infrastructure



Pod Architecture

The Exchange server design solution consists of eight server pods in five geographic locations optimized around the distribution of employees. Since the largest concentrations of employees are at the Cisco headquarters in San Jose and at Research Triangle Park (RTP), the number of pods is greater in those locations. The remainder of the pods are situated at the location best suited to service all the global Cisco locations in various time zones.

Each pod supports up to 11,200 users on a maximum of 20 servers. A total of 130 servers have been used across the Cisco locations. One mail server supports up to 800 mailboxes, including users and conference rooms. The server functions are described in the following table:

Server Function	Per Pod	Characteristics
Bridgehead	1	• Point of connectivity into the core or other Exchange routing groups • Handles SMTP, MAPI infrastructure traffic for the pod
Front-End	2	• Load balanced via CSM switches • Handles OWA, IMAP, HTTP functionality • Communicates with Back End servers on behalf of non-Outlook clients
Mailbox	2 to 14	• Scalable to user population, up to 11,200 users per pod • 800 mailbox limit per server (includes users and conference rooms) at 300-MB soft quota and 450-MB hard quota
Free/Busy (public folder) server	1	• Handles all calendar data
Backup Server	1	• Manages backup functions (disk to disk, *not* backup to a server) • Uses Veritas Netbackup plus custom scripts (EMC)
Hot Spare Server	1	• Can take over function of any server in the pod (not automatic)

"The Exchange server pods were designed to be horizontally scalable—that is, they were designed to grow from 2 to 14 mailbox servers per pod as the Cisco population increased. Keeping the servers small and the hardware the same has allowed Cisco to achieve high availability without the complexity and overhead associated with traditional clustering solutions," says Nick Martin, lead design engineer. "This horizontal scalability aligns with Cisco IT's approach of keeping solutions simple."

Each pod was initially deployed as a group of Compaq DL380-G3 servers connected through Cisco MDS 9500 storage switches to EMC Clariion CX700 storage devices. This architecture is integrated with the Active Directory infrastructure.

The role of the backup server is to back up any data present on the servers; it does not function as a backup to a server in the event of a hardware failure. The spare

server is designed to take on any of the roles conducted by the other servers and requires manual intervention to achieve these roles. This separation of roles, plus having an infrastructure of process-specific servers contributes significantly to the reliability mentioned before.

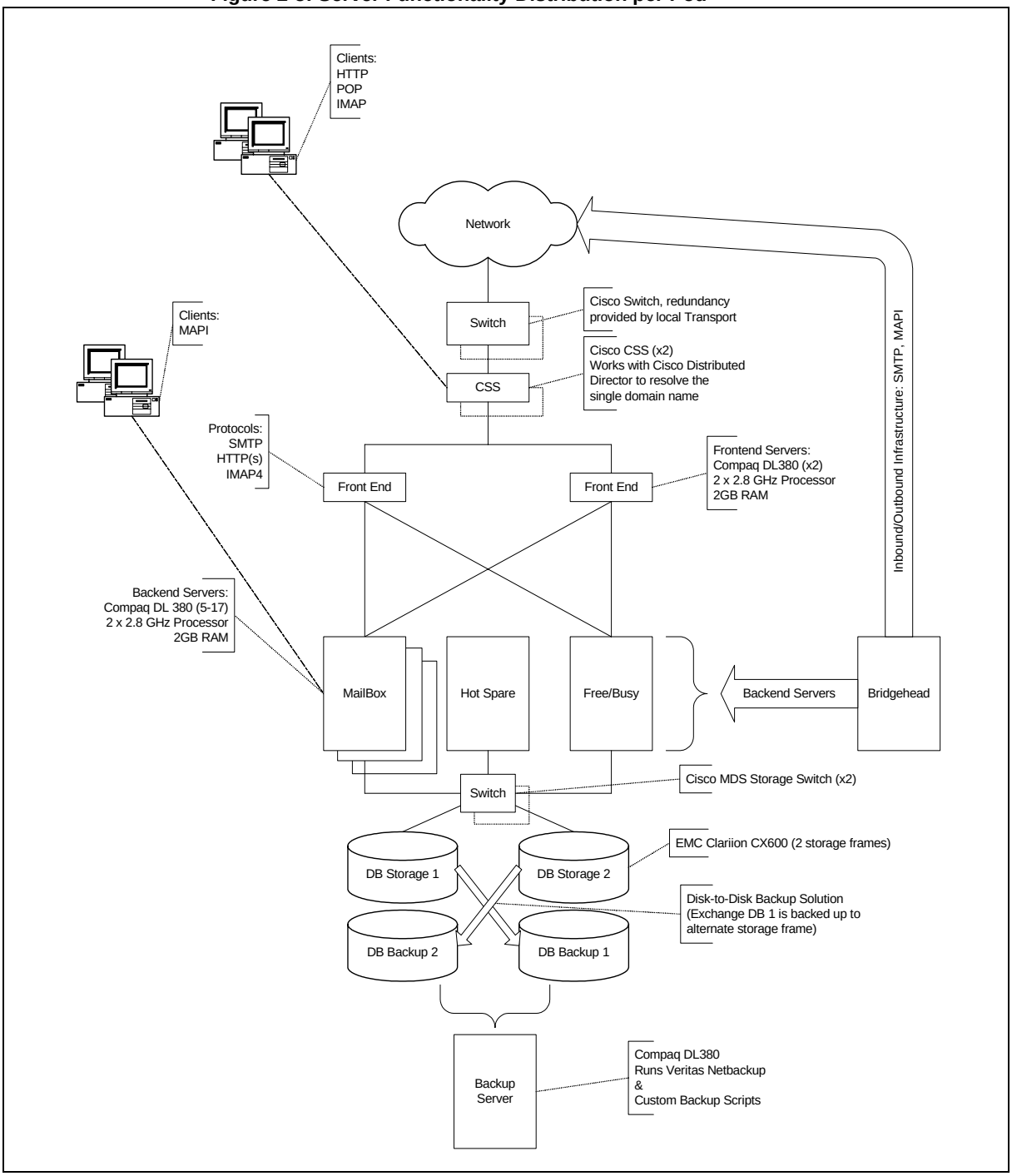
Server Hardware Configuration

Each server has a standard hardware configuration allowing for ease of deployment and maintenance. In addition, servers can be readily replaced and adopt new roles as required. To achieve this standardization, each server has the following characteristics:

- Is a Compaq DL380, either a G3 or a G4
- Contains a dual processor and 4 GB of memory
- Incorporates two network cards for redundancy and load balancing
- Is rack-mounted in a Class-A Data Center
- Includes out-of-band management cards
- Includes two Emulex host bus adaptor (HBA) cards for SAN connectivity

Figure 2-5 illustrates the server functionality distribution within a pod.

Figure 2-5: Server Functionality Distribution per Pod



SAN Infrastructure: Cisco MDS and EMC Clariion Storage

"Integral to the design is the use of storage area network (SAN) capabilities," says the Cisco SAN expert, Matt Runyan. "SAN implementations are common in many large organizations and allow many servers to access consolidated databases. Consider SAN as a high-speed subnetwork of shared storage devices, architected is such a way that all storage devices are available to the servers on the subnetwork. SAN infrastructure is part of the Cisco Exchange Server 2003 implementation and is fundamental to performance in such global solutions."

SAN connectivity was provided by the Cisco MDS 9000 series, which allowed the Architecture team to build highly available, scalable storage networks with advanced security and unified messaging. One advantage of the SAN solution to data storage was gained by recognizing the importance of consolidated data storage in helping ensure unified access to information. Information stored in a pooled SAN network is easier to access and share across the server pod.

The two Cisco MDS SAN switches provide connectivity to the SAN. These are either MDS 9506 or MDS 9509 switches, depending upon the rack configuration. The dual-fabric design using MDS switches adds to the robustness and reliability of the solution by providing redundant connectivity from each server to each storage array. Cisco Virtual SAN (VSAN) technology allows for multiple SAN environments to share the same physical hardware, maintaining segregation of environments while maximizing port utilization.

Cisco MDS switches were used with EMC Clariion CX700 storage arrays. The SAN infrastructure is a reliable, highly scalable solution, capable of providing terabytes of data storage.

The networked storage environment enabled multiple servers running different operating systems such as Windows, UNIX, and Linux to share the same storage. EMC Clariion allowed management of the storage network through a centralized visual management tool. The storage solution was designed to provide dual storage processors, RAID data protection, redundant SAN switches and power supplies, cross-frame backups, and redundant host bus adapters to preserve connectivity in case of switch outage.

Server Software Configuration

In keeping with the standardization and the ability to readily swap and maintain servers, each server has the following software requirements:

- Microsoft Windows 2003 Server Enterprise Edition
- Microsoft Exchange Server 2003 Enterprise Edition
- Third-party server antivirus software
- Third-party e-mail antivirus software
- Veritas NetBackup for tapeless backup
- EMC Power Path for multipathing

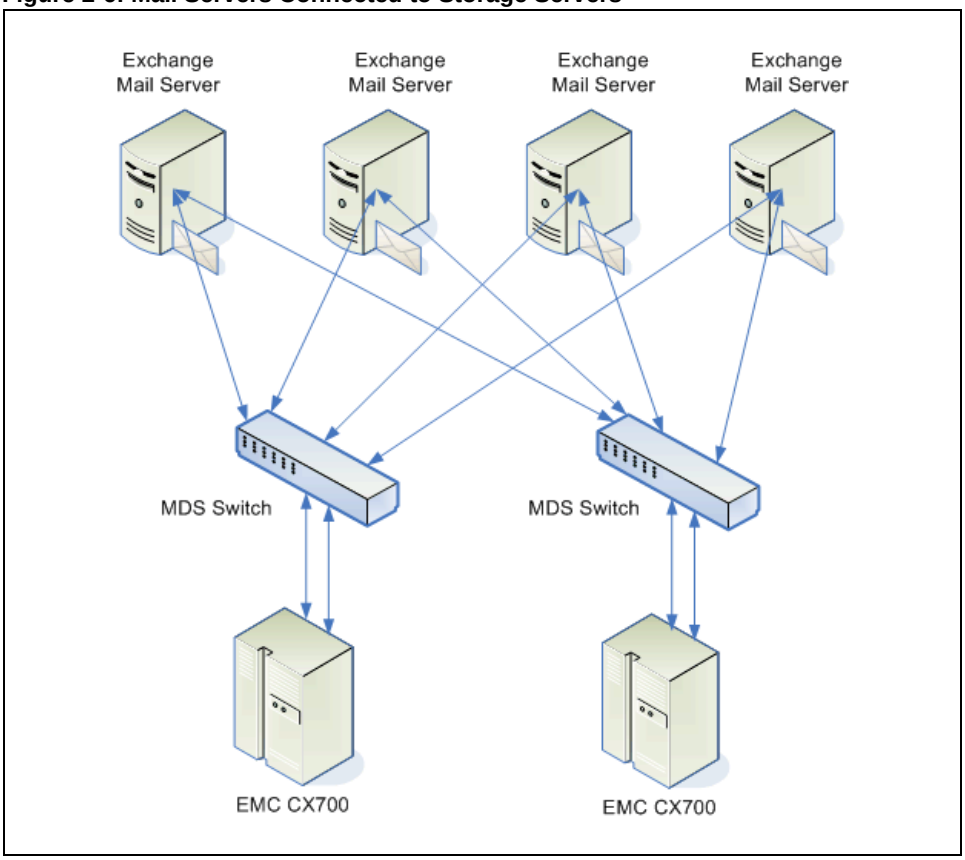
Additional software may also be installed for specific purposes, and configurations may vary according to the role performed by an individual server. The MDS switches and the SAN have their own standard software associated with them as supplied by the manufacturer and configured accordingly.

Data Storage Architecture

Each pod has SAN capabilities associated with it. The SAN is used for storage of the data, leaving the servers free for operational service. Dedicated SANs were deployed with the Exchange 2003 infrastructure worldwide in locations that did not already have existing SAN capacity.

Mail servers and their connection to storage servers are shown in Figure 2-6, where each Exchange server has a connection to both MDS switches at each pod. Should one switch fail, the request would be picked up by the other MDS switch. Two SAN storage frames are present for each pod and each MDS switch has two connections to each of the SAN storage frames. This redundancy provides both failover and load-balancing capability. As mentioned before, each SAN storage frame has two service processors associated with them to help ensure both redundancy and optimal performance at the storage array level.

Figure 2-6: Mail Servers Connected to Storage Servers



The SAN infrastructure is designed so that data is backed up across the storage frames. That is, each server backs up to each other—they are not mirrors. The SANs provide storage for the Inbox capability of e-mail and form a working area for the user's mailbox. Archived e-mail is stored in the e-mail client locally on the respective user's desktop; for example, stored in the .pst file for Outlook users. The corporate intellectual property within e-mail is then preserved because the SAN capability is combined with the automatic daily backup of each desktop.

For over 50,000 users the SAN provides the following mailbox quota:

- 450-MB warning—users get an automatic warning when their Exchange server mailbox exceeds 250 MB with suggestions on how to reduce the amount of stored data
- 300-MB soft quota—people sending e-mail to this box will get a warning saying that the mailbox owner may soon not be able to send or receive e-mail
- Warning at 250 MB—the mailbox is not able to send or receive e-mail until the data stored in it is reduced

The size of the mailbox at the local desktop for archived e-mail is only constrained by the hard disk and the habits of the users. Many users will store their older mail on their local laptop or desktop, and others will chose to delete it.

Network Architecture

The Exchange Server 2003 implementation does not require any specific network considerations. The approach at Cisco is to extend the network to the user, thus eliminating the need for many internal firewalls. Such an extension of the network makes e-mail inclusive with other applications and utilities.

Routing and traffic management utilize the built-in features of Exchange Server 2003 and the capabilities of the core using Sendmail for e-mail routing. Exchange Server 2003 relies on Active Directory, and Cisco uses an approach in line with other business needs for the population and management of Active Directory.

When performance criteria were specified, latency requirements were defined for users, and bandwidth thresholds were set for both users and sites.

Latency Requirements

Optimized performance was obtained by running Outlook in cached mode on users' laptops: their e-mail client synchronized when connected to the network but performed normally in all other respects when it was running disconnected from the network. Cached mode was determined to be the optimum configuration for all Cisco users, not just small/remote offices. Any user was to be no further away from a server than a one-second round-trip latency. This latency was determined to be the threshold for acceptable performance for Outlook clients using cached mode.

Bandwidth Requirements

The following criteria were chosen for optimal performance of the Outlook clients when connecting to Exchange:

- The minimum bandwidth available per user was set at 5 kbps.
- For any given site, the bandwidth available needed to be in excess of 64 kbps.

Sites that did not meet these criteria would experience slow responses from the Exchange servers. By the time Exchange was deployed, all sites met the 5 kbps and 64 kbps thresholds.

Exchange Architecture Component Technologies

The Exchange messaging solution uses the following component technologies:

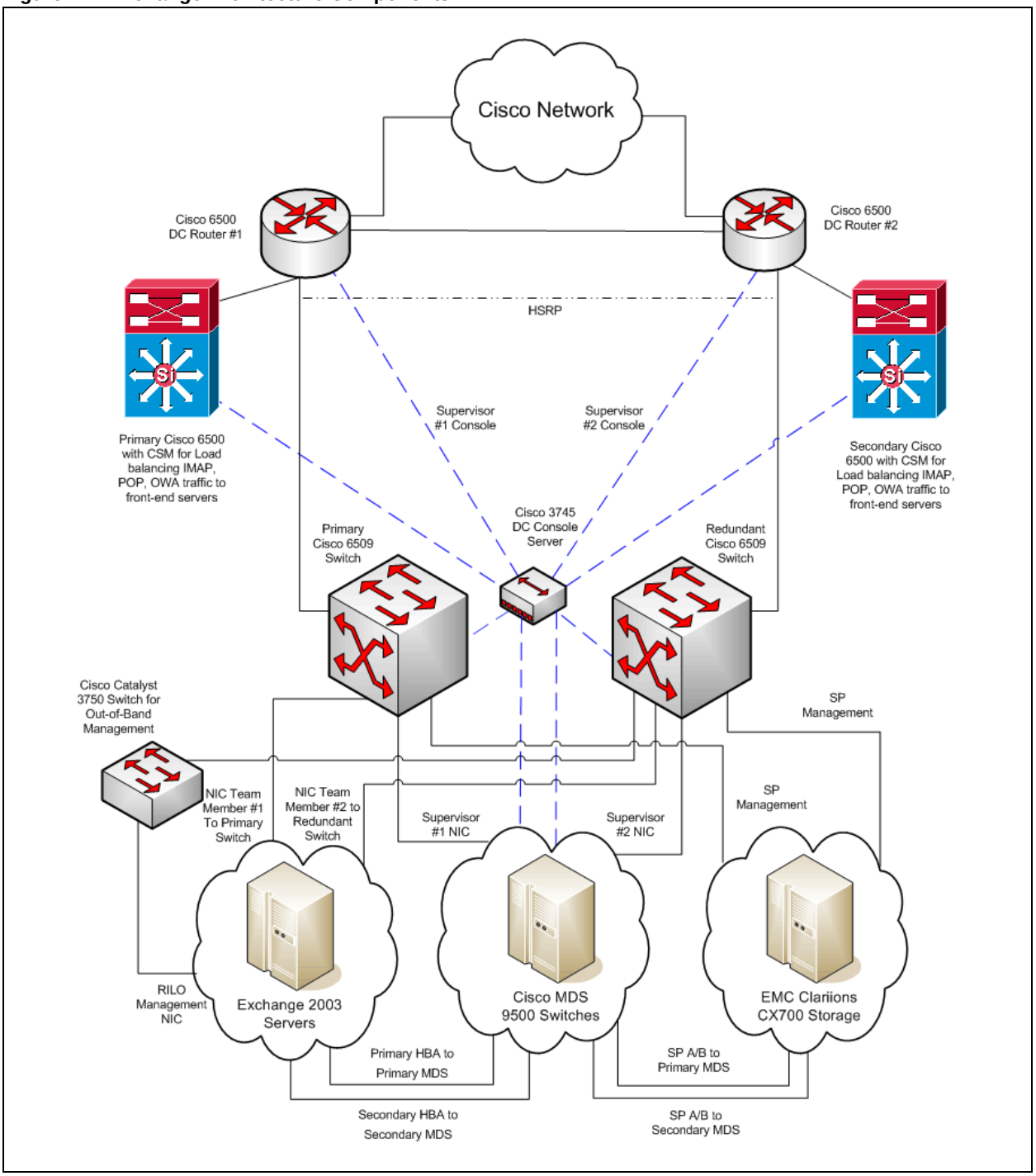
- Cisco 6500 Data Center (DC) Routers for routing messages
- Cisco 3640 Data Center Console for managing routers, MDS switches, and CSMs
- Cisco MDS 9500 Storage Switches to connect the pod servers to shared storage frames within the data center
- EMC Clariion CX700 (SAN) storage to store large amounts of user data
- Cisco CSM (Content Switching Module) for dynamic load balancing across servers
- Cisco SSLM (SSL Module) to support secure shell encryption for secure mail traffic, and to offload the processor-intensive encryption load from the servers
- Cisco Catalyst 3750 Switch for out-of-band management
- Microsoft Exchange Server 2003 Enterprise Edition software on the servers
- Microsoft Windows Server 2003 Enterprise Edition software on the servers
- Microsoft Outlook 2003 software on the client laptops and desktops
- Microsoft Active Directory infrastructure to provide user authentication
- Compaq DL380-G3 servers (standard Exchange server platform) to provide server functions such as bridgehead, front-end, mailbox, and free/busy
- UNIX Messaging Core to provide inbound/outbound traffic automation

The e-mail and calendaring solution showcased several Cisco products, specifically the Cisco MDS, SSLM, and CSM products. The CSM, as part of the combination access switch and DC gateway, provides load balancing of IMAP, POP, and OWA traffic to front-end servers by allowing dynamic resolution of Domain Name Server (DNS) entries to find the closest server under least load. The Distributed Director solution virtualizes service delivery by decoupling the service from the hardware. Cisco MDS 9500 storage switches are used for switching EMC Clariion CX700 storage arrays.

Most importantly, Cisco CSM allows using a single server name for e-mail services.

Figure 2-7 shows the Cisco components used in the storage switching, DC routing, and e-mail virtualization solution.

Figure 2-7: Exchange Architecture Components

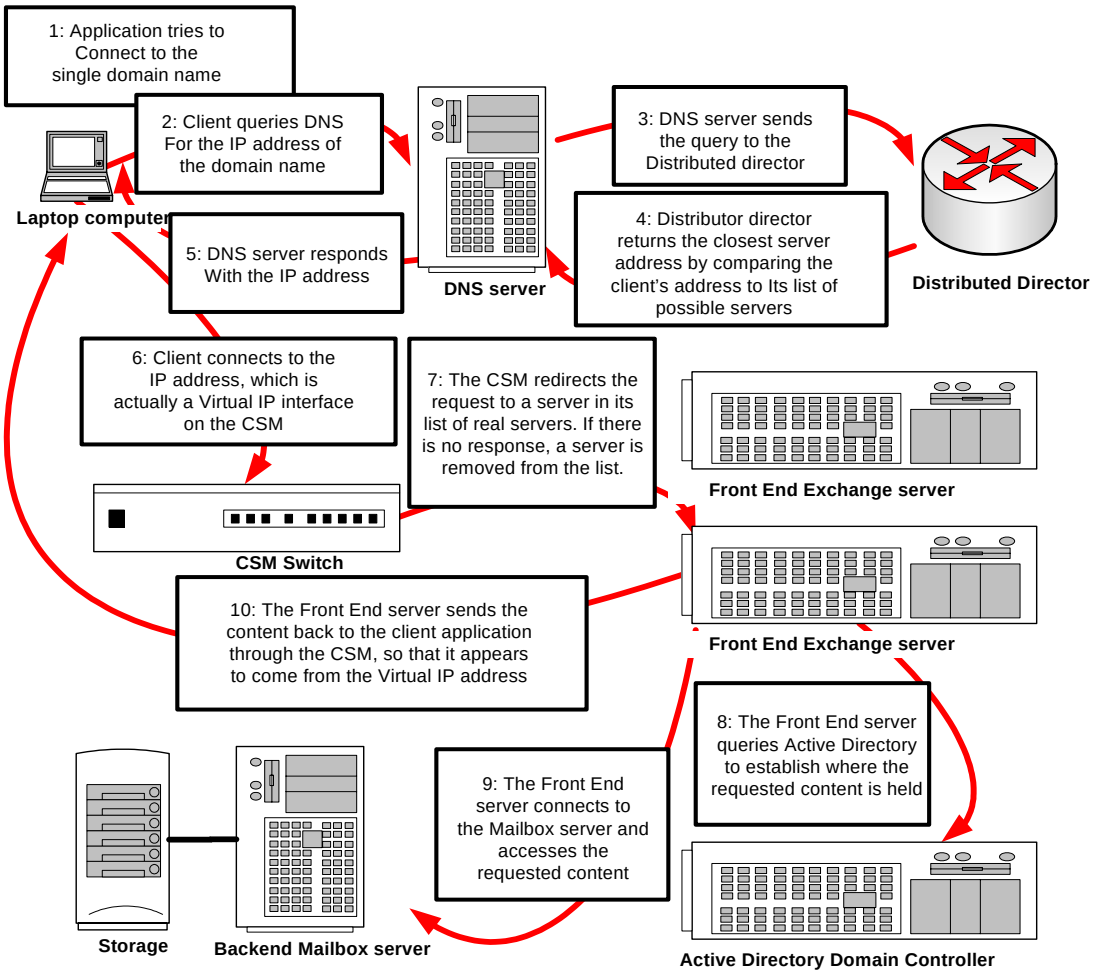


Distributed Director Architecture

To optimize finding the local e-mail server, the Exchange Server implementation used the Cisco Distributed Director. The use of Distributed Director allows for dynamic resolution of the Domain Name Services (DNS) entries to identify a user's closest Exchange pod. One Distributed Director is located in San Jose, one in RTP (Research Triangle Park), and one in Amsterdam. There are plans to replace the Distributed Director with another Cisco product, Global Site Selector (GSS).

The use of Distributed Director to allow a client to have a single configuration is shown in Figure 2-8. The desktop client initially queries the DNS server for details of the mail server to use. This request is then handled by Distributed Director to find the closest server. Distributed Director returns the result to the desktop client for automatic configuration. Once established, the interaction between the client and the Exchanger server is direct. New details would only be required on a change of location or server.

Figure 2-8: Cisco E-mail Processing



The Content Switching Module (CSM) 6500 combination access switch and data center gateway allow load balancing of IMAP, POP, and OWA traffic to front-end servers.

Cisco leveraged CSM to virtualize the e-mail infrastructure to provide a single server name for e-mail service. All clients connect to the single domain name, which is a distributed director alias that directs the client to the nearest CSM virtual IP address. The CSM connects the client to one of the front-end servers. The front-end servers locate the correct mailbox server by querying an Active Directory (AD) global catalog and proxy the request to that server. There is no direct communication between the client and the mailbox server. A front-end server can connect to any mailbox server in any location or domain. This applies also to Outlook Web Access (OWA).

The benefits of this architecture are as follows:

- Allowing users to point their e-mail client to a single DNS entry, irrespective of their geographical location
- Eliminating the need for a lot of manual configuration changes by both users and Systems Administrators
- Allowing immediate access, without manual reconfiguration, when a user connects to a different part of the Cisco network; for example, connecting a laptop when traveling between offices
- Allowing use of this solution with individual servers or with load balancers—as is the case in selected sites of high-volume traffic within Cisco
- Enabling users to avoid performing any explicit reconfigurations when backend maintenance is performed—for example, for patches and mailbox moves or during disaster recovery

Mail Routing Architecture

The e-mail architecture uses an Exchange-to-Exchange mail routing design, where Exchange forwards to the message core such items as outbound mail or mailing lists, if they are outside of the Exchange realm. This routing design has the following advantages:

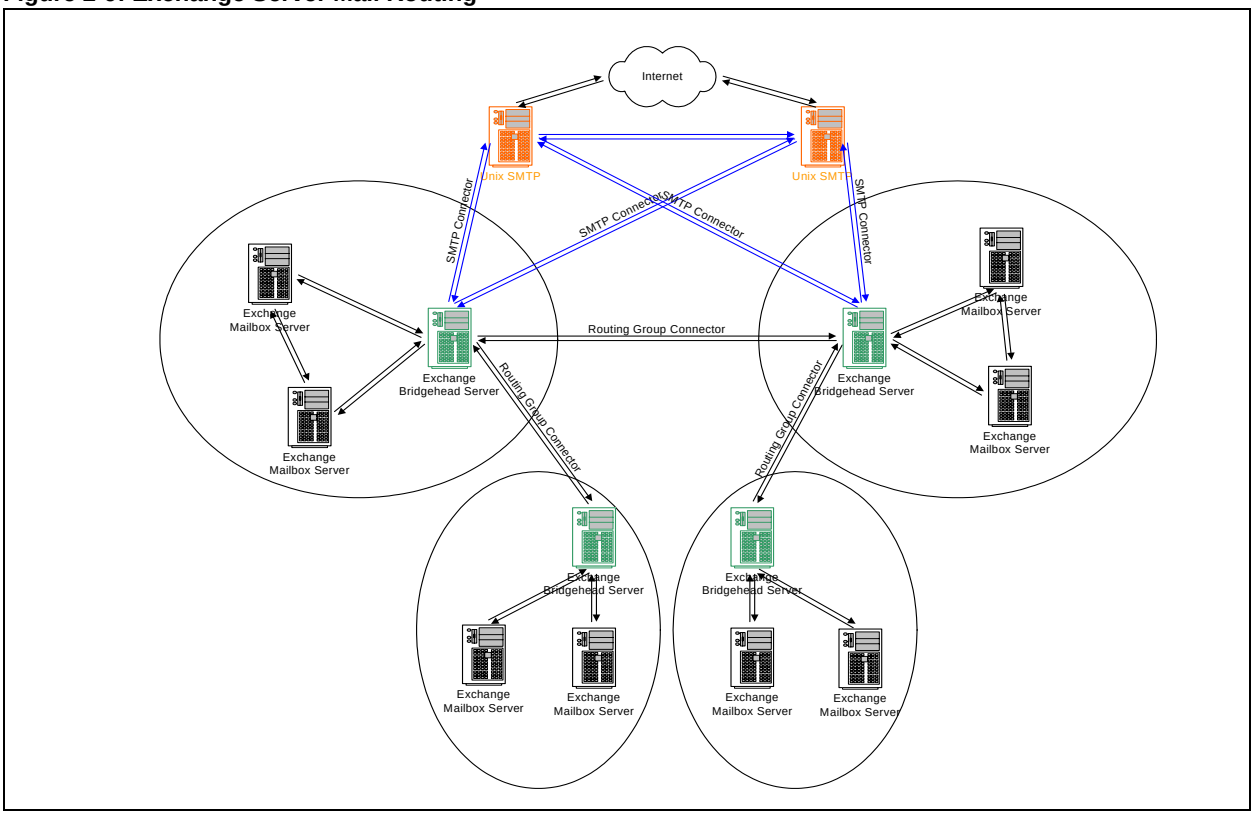
- Microsoft-recommended approach
- Full message tracking capabilities (within Exchange)
- Bridgehead load balancing
- Reduced risk of duplicate messages and mail loops

Exchange Server Mail Routing

The Exchange mailbox servers route the mail through the Bridgehead, which is the single point of contact with the UNIX Message Core (UMC). Each Routing Group must have an Exchange 2003 Server designated as the Routing Group Master. The Bridgehead server of the first Pod in a site is the Primary Exchange 2003 Server. This is a single native Exchange organization with multiple routing groups. E-mails within the Exchange organization are routed using Exchange Routing Group Connectors (RGC). Exchange RGC Bridgehead servers are allowed to talk to each other directly. Routing group boundaries and RGC objects are configured inline with available physical network paths. Where appropriate, multiple RGCs are implemented to allow fault-tolerant mail transport.

Figure 2-9 shows the Exchange server mail routing pattern.

Figure 2-9: Exchange Server Mail Routing



Exchange Calendar System Architecture

The calendaring design exemplifies the principles of a robust, reliable solution. Each Exchange pod contains one server dedicated to calendaring, called the free/busy (FB) server, which acts as a special purpose “Public Folder” server. The user and conference room data required for operating the calendar functionality is obtained from Active Directory. This calendar data is replicated between free-busy servers, giving each one a comprehensive data set. The failure of a free-busy server within a pod is compensated for by the other free-busy servers within other pods.

The browser-based Outlook Web Application (OWA) supports non-Outlook users. Using OWA, any user within Cisco can access his or her e-mail or calendar from a browser. The required information is drawn from and stored in Exchange.

Free/Busy (FB) Server

The FB server holds all of the calendar details and resource information from all sites, as follows:

- Houses availability information about the clients
- Stores conference room mailboxes
- Has one public folder store (database)
- Has one database for mailboxes

Free/Busy Data

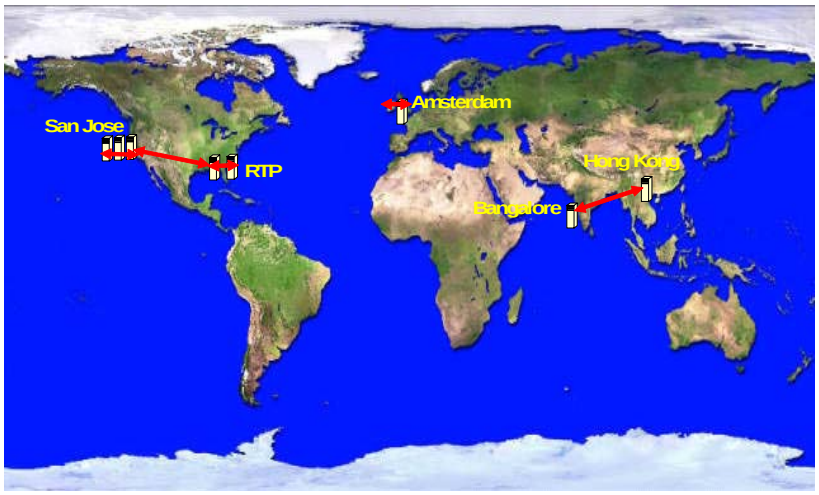
The free/busy file for a client is created the first time that the client logs onto Exchange. By default, two months of free/busy data is published for a client. This window can be changed by the client by using Microsoft Outlook. By default, free/busy data for a client is updated when one of the following occurs:

- When users change their calendars
- When the user logs out of Outlook
- Every 15 minutes while logged in

Data Replication

The objective of data replication is to provide free/busy data for each user as close to his or her client as possible. The architecture provides two major routing points. The intra-region replication is "fully meshed" (see Figure 2-10) so that e-mail destined for users within the same region stays within the region.

Figure 2-10: Intra-Region Replication - Full Mesh



Inter-region replication is provided between Site Folder servers for routing e-mail between regions. The Site Folder server is the first Exchange 2003 Server in each Administrative Group. This design results in each region's free/busy data being on at least one server in the local region. Clients should never have to "reach across the ocean" to retrieve availability data for clients in other regions. The scheduling replication cycle is every 15 minutes, which provides approximately 30 minutes maximum update visibility across the globe.

Figure 2-11 illustrates the replication between regions.

Figure 2-11: Inter-Region Replication - Site Folder Servers

Exchange 2003 Site Placement

The centralized placement follows Active Directory deployment and network topology (hubs) which are located in the following geographic areas (see Figure 2-1, "Location of the Exchange 2003 pods," on page 2-7):

- United States—two sites, one on the West Coast, and one on the East coast
- Asia Pacific—two sites, one in India and one in China
- European and Emerging Markets—one site in Western Europe

Risk Mitigation Strategy

The following "slow and cautious" pace was established to mitigate risks:

- Allow a 2-week hardware trial period prior to the first IT users being migrated to Exchange.
- Allow an additional 2-week monitoring period after IT users are migrated.
- Allow two additional 1-week monitoring periods during general user migrations.
- Migrations can stop at any time.

Remote Field Sites Map to Exchange Messaging Sites

Remote field sites "map" to Exchange messaging sites as follows:

- Less than 1-second latency
- More than 5 KB per user available
- More than 64 KB per site available
- Outlook "cached mode" assumed

Virus Protection Architecture

Virus management at Cisco is handled with a layered approach utilizing multivendor solutions.

Security Layers

The first step is to create a perimeter around the core mail servers. This defensive wall is made of mail gateway appliances operating third-party antispam and antivirus software. In addition, each core server runs its own instance of the same antispam and antivirus software.

The layered approach allows

- Port blocking, antivirus, and antispam operating at the perimeter as required
- Scanning at the messaging core infrastructure
- Scanning at server level
- Scanning at the desktop
- Attachment blocking (Outlook/Exchange 2003)

Multivendor Advantages

The multivendor approach has many advantages as follows:

- Mitigation of risk associated with release dates of patches
- Minimization of dependency upon one vendor
- Significantly increased odds of successful virus detection and elimination

Antispam is conducted by the core infrastructure using a similar philosophy.

Protection of Exchange 2003 Against Virus Activity

Cisco uses third-party software to protect Microsoft Exchange against viruses by scanning Exchange incoming and outgoing files. Files and directory exclusions are in alignment with Microsoft described installations. In addition, a dedicated virtual global team of Cisco engineers supports virus protection.

Backup and Recovery

In keeping with the high reliability solution approach, backup figures prominently within the Cisco Exchange Server 2003 implementation. Backup of the desktop and e-mail is performed daily using Connected TLM, a server software backup program that runs scheduled backups of servers and laptops to storage devices within the data center. Whether it is the .pst file in Outlook, or its equivalent in other applications, the backup cycle is 90 days long.

The core infrastructure is used for mail routing only—under the worst-case scenario, the queue could be up to four days long—but mail typically resides here for less than a minute.

Backup Capabilities

Some of the Exchange backup capabilities are as follows:

- User mailboxes are backed up within the SAN structure.
- SAN is backed up disk to disk between the subsystems (no tape backup is required).
- Full backup is conducted daily using Veritas NetBackup.

- Rapid restore from disk (full database) is available up to three days back; images further back can be restored, but it takes longer.
- Deleted users mailboxes can be restored for up to 31 days back using Exchange functionality.
- Individual e-mails can be recovered (by user) up to 14 days after deletion using Exchange functionality.

Remotely Managed Backups

Remotely managed backups are managed by a backup server running Veritas Netbackup and custom scripts. Nightly full backup of Microsoft Exchange databases and logs uses the Veritas Netbackup Exchange agent for backup feature to back up to disk. Three full copies of production databases are kept online (disk in alternate storage frame). Daily e-mail reports of backup success/failure are sent to the Exchange operations team.

Risk Mitigation Redundancy-based Strategy

Risk mitigation strategies were used in the design and development of the server and storage device hardware. The pod design has many built-in redundancies. The risk of large-scale outage is minimal, short of losing the entire Data Center.

Server Hardware

Risk mitigation strategies for server hardware were as follows:

- Stable Design—The design of the Exchange Server was proven through a large-scale pilot prior to the global rollout.
- Redundant Front-End Servers—Used to prevent an outage if a single server goes down.
- Hot Spare Server—An extra server was installed in each pod to take the place of any other server in the pod, in case a serious repair required lengthy downtime.
- Redundant Power Supplies—Each power supply is connected to a separate Power Distribution Unit (PDU) in the rack while each PDU is connected to a separate power feed.
- Redundant Host Bus Adapters—These adapters keep servers connected to storage in case of single HBA outage.
- Redundant Network Interface Adapters—Each Network Interface Card (NIC) is connected to a separate switch in the Data Center (DC) to maintain server network connectivity in case of switch outage.

Storage

Risk mitigation strategies for server hardware were as follows:

- Dual Storage Processors—A single storage processor (SP) can carry the load for the entire storage array, if needed.
- RAID Groups—The array configuration offers redundancy by design. Hot spare disks are built in.
- Redundant Power Supplies
- Cross-frame Backups—The mailbox servers have primary store on one frame and full backups on the other frame so that a full Clariion outage will not result in total loss of data.
- Redundant Network Interface Adapters—Each NIC is connected to a separate switch in the Data Center to maintain server network connectivity in case of switch outage.

- Redundant Storage Array Ports—Multiple storage processor ports were used on each array to provide redundant connectivity to the SAN.

Lessons Learned

This section includes lessons from both Design and Engineering and hardware deployment.

Skilled Resources Not Available In-house

When the Exchange project was started, Cisco lacked skilled resources on the Exchange platform. There was a need for the same few resources in both Design and Engineering and Operations work. Once the first Exchange pod went active, the Design and Engineering resources were tied up doing Operations work, which delayed future development work required for Exchange. To solve this problem, the Global E-mail and Calendar Program team opted to supplement existing staff with contractors. Specific high-level contractor engineers were brought in to work on Design and Engineering activities, and Exchange operations work was outsourced to a vendor.

Hardware Deployment Took Longer than Expected

The global deployment of the Exchange hardware took much longer than expected. Miscellaneous problems were encountered, as follows:

- Lack of physical space in some data centers
- Delays in equipment delivery and tracking overseas
- Poor response from local data center staff
- Mismatches between ordering timing and budget commits

To avoid lengthy delays for large projects—those requiring a large amount of equipment to be deployed—several guidelines are suggested:

- Start planning for the deployment at the beginning of the project. Begin having discussions with the data center teams so any issues (such as data center space, power issues) can be identified early and work can begin to resolve those issues prior to the go-live date.
- Dedicate a project manager to the deployment effort. History has shown that a part-time effort is not enough when managing a global deployment. The deployment project manager should manage all aspects of deployment, including budget, timeline, resource availability, issue tracking, and reporting.
- Leverage resources within the region to assist in ordering hardware. A resource that orders gear for a particular country will be more familiar with the ordering and tracking process. Also, ordering from within the region will help avoid lengthy customs delays in some cases.
- Use specialized teams at each site to perform the equipment installations. Local data center resources in some countries can be unreliable and are many times accustomed to installing only a single server, not a complex messaging system. It is recommended to have a single installation team travel from site to site performing the installations. This will help ensure consistency across the installations.

MODULE 3

Communicating to Drive Enterprise Adoption of New E-Mail and Calendar

Content

Background

This module describes the communications program behind the Cisco® IT Global E-mail and Calendar migration to Microsoft Exchange Server 2003 within the Cisco global network. In 2006, Nathan Ratzlaff and Marilyn Nagel were the recipients of a Gold Quill Merit award for the *E-mail Migration Communication Program*. The International Association of Business Communicators (IABC) Gold Quill awards are "the highest level of professional acknowledgement within business communication today."

About the Global E-mail and Calendar Program

In 2005, the Cisco IT Global E-mail and Calendar Program team deployed Microsoft Outlook/Exchange as the new e-mail and calendar tool for Cisco. Earlier in 2004, Cisco IT deployed Microsoft Exchange within Europe, but the calendaring services remained local. The goal was to complete migration to Microsoft Exchange in the Asia Pacific and Americas regions by September 2005. Deployment consisted of first implementing e-mail functionality and, after the e-mail migration was complete, implementing the calendar function.

Global E-mail and Calendar Program: Communications Team

A global cross-functional team was assembled with members chosen for their expertise in various disciplines and functions. In addition to the program manager, the Global E-mail and Calendar team consisted of a lead for each track. A core member of the Global E-mail and Calendar Program team, the Communications track lead was responsible for overall communication strategy and development of communication workflows in various media.

"Any major change to the tools that employees use to do their work requires them to understand the reasons behind the change, as well as the benefits and the schedule, to help set their expectations for the future. The Communications track team developed the communications strategy for disseminating information about changes to users through such channels as e-mail, voicemail, videos, Town Hall meetings, news articles, posters, and Websites," says Nate Ratzlaff, Cisco IT Communications track lead.

Cisco Work Environment and Culture

The Cisco work environment and culture reflect the modern office—no longer contained within a physical structure but mobile and geographically dispersed. Cisco employees do not need to be in the same location to work together effectively, and many telecommute from home or small remote offices or work while traveling. Most Cisco employees communicate and collaborate daily with other employees worldwide. Because Cisco is a busy, global work environment, employees are accustomed to trying the latest technology and are comfortable using a variety of communication tools. As with any change, though, people are often resistant to change.

"We knew that influencing the majority of employees to make a wholesale change from one e-mail application (Qualcomm Eudora) to another (Microsoft Outlook) was going to be a difficult task, especially given that each employee had to manage his or her own data migration," says Ratzlaff. "We also knew, however, that employees were really looking forward to a true global calendaring application that was not available with Meeting Maker, which only worked in each region and made it difficult

to coordinate global meetings. So, although we were presented with a challenge on the one hand, we also had a huge opportunity on the other hand to use as an incentive, or a 'golden carrot,' to help increase adoption."

Considerations for Communication Strategy

E-mail Environment

For all Cisco users, e-mail is a business-critical, personal communications application. In fact, e-mail messaging is at the core of how the company functions. Users were very comfortable with their legacy e-mail and had already learned to live with its inherent limitations and deficiencies. The new set of messaging tools had very different behaviors, which presented a big challenge for the migration. Users were required to manage their mailboxes effectively in order to quickly find and retrieve important information at a critical moment. Since nearly all users stored/archived their historic e-mail, very large mailboxes had to be migrated to the user's new e-mail application. This created some problems in the Microsoft Outlook environment, as will be discussed in the E-mail and Calendar migration module.

It was important to understand the cultural, business, and technological influences that would affect the adoption of a new system, such as Microsoft Exchange and Outlook. By understanding these influences, Cisco could leverage positive influencers to counter negative perceptions.

Positive Influences	Negative Influences
• Alignment with the business direction at Cisco—the e-mail and calendar migration provides the architecture for Cisco communications products initiatives, such as Cisco MeetingPlace® and Cisco Unity® Unified Messaging • The ability to showcase the enterprise messaging technologies at Cisco to customers • Support for Linux and UNIX platforms, as users would have a choice of e-mail delivery methods and could access the global calendar with either a Novell Evolution client or with a Web browser and Outlook Web Access (OWA) • The long-term prospect of global calendaring, as compared to region-specific calendaring	• General sentiment about Microsoft products • Possible bias about Microsoft Outlook • Resistance from Linux and UNIX platform users • Negative rumors/stories about problems that occurred in the Cisco European region migration • Satisfaction with Eudora as a mail application (no recognized need to change) • Preference for changing calendar first because there were more calendar problems than e-mail problems • Schedule changes and delays • Lack of familiarity with the new tool • Application failures and outages

Calendar Environment

Calendaring services are also used by many Cisco employees to manage their daily/weekly schedules, organize meetings, and book conference rooms. In addition, power users (such as administrative assistants and executive administrators) manage the calendars of the managers and executives whom they support. They are heavy users of calendar sharing and calendar delegation, and sometimes are proxies for special conference rooms. Managers and team leads are also power users of calendaring services. This was a different culture from that of the European and Emerging Markets, where most of the meeting management is performed by administrators.

Positive Influences	Negative Influences
• Alignment with the business direction at Cisco—the e-mail and calendar migration provides the architecture for Cisco communications products initiatives such as MeetingPlace and Unified Messaging • The ability to showcase enterprise messaging technology at Cisco to customers • Meeting Maker end-of-life • The benefits of global calendaring, as compared to the limitations of calendaring specific to a region	• The cold cutover approach forces all users to manually recreate their calendar in Exchange • Users will have to learn how to use a new calendaring application: a change from Meeting Maker to Microsoft Outlook 2003, Microsoft OWA, or Novell Evolution

Challenges

The following sections describe the challenges, issues, and constraints that influenced the Global Exchange Deployment communications solution.

Facilitating User Acceptance and Adoption of Exchange Messaging

"The greatest challenge for the Communications team was to develop a solution that best prepared approximately 40,000 global Cisco employees to accept and adopt Exchange e-mail and calendaring services worldwide. If users understood how Exchange messaging services could make them more efficient in their daily work lives and they knew where to find information and receive technical support, they would more readily accept and adopt the new messaging service," says Adel du Toit, Calendar Cutover Track lead.

To build enthusiasm and support for the change, as well as to minimize confusion and the potential number of support calls, the team determined that it was important for program communications to convey program objectives and benefits, status, expected system behavior and functional differences.

Program objectives and benefits

It was important to describe why Cisco was moving to the Exchange messaging system; how both employees and Cisco would benefit; and how Cisco users would be affected, depending on their role, location, and working style. In communicating the program objectives and benefits, it was important to convey a vision of the future of converged network-based communication, illustrate the potential of the new messaging system, and build user excitement and enthusiasm for both. This

deployment was not just a replacement of an outgrown e-mail and calendaring system, but was intended to provide a next-generation tool for global messaging to help Cisco employees be more productive. The Global E-mail and Calendar Program team believed that if users could understand the larger context, they would be more accepting of temporary inconveniences during the migration period.

Program status

It was important to describe the schedule of Cisco site moves from existing e-mail to Exchange e-mail; how users could prepare for the calendar cutover and how they could access training, documentation, and support; and the duration of access to their former e-mail and calendar systems to access stored data.

Expected system behavior

It was important to describe how to configure the user's preferred e-mail application to connect with the Exchange server and explain the types of policies that govern the Exchange environment.

Functional differences

It was important to describe the Outlook e-mail and calendaring functions that were new or different from their previous system, and to provide information to different types of users so they could learn to use the new system capabilities to improve their productivity.

Understand the Needs of Business-Critical Users

The Global E-mail and Calendar Program team needed to understand how Cisco employees used the existing e-mail and calendaring systems, and their preferences for system features, user training, and communications. The team recognized that, although every employee would be affected in some way by the implementation of Exchange messaging, the high message-volume and calendar-intense "power users" in particular would require a smooth transition to the new e-mail and calendaring system.

Power users were as follows:

- The OOP (Office of the President)
- Senior executives (who are provided additional support from Cisco IT)
- Executive assistants (who may support several executives and need to manage their calendars and e-mail)
- All types of managers including project and program managers
- Sales people who depend on e-mail to communicate with their customers and on calendars to set up appointments

These users could not afford to lose an e-mail message or miss a meeting or use time for a steep learning curve. Gaining their support was important, because they could be the most vocal critics (or advocates) of the program.

Communicating Migration Challenges

The Global Exchange Deployment followed a strategy of migrating approximately 2000 users per site to the new e-mail system weekly until all e-mail systems in a site were migrated. The team would then move on to another site until all sites in the global region were completed. “The site migrations were prioritized by the number of users at each site, with large sites going first. The program team decided that this was the best approach to preserve e-mail networking and the least likely to generate a large number of support calls from users unfamiliar with the new e-mail system interfaces. However, a lack of user awareness of how to install and use the new system, or any system issues due to the migration, could precipitate a high volume of calls to customer support after each site cutover—most of which could be prevented with targeted, end-user communications,” says Jerry Applegate, Cisco IT messaging migration program manager.

The team anticipated two types of challenges that end users might face during the migration—learning curve questions and transition issues—and prepared a variety of communications to address them.

Learning Curve Challenges

Transitioning from Meeting Maker to a global Exchange calendar solution, end users (and especially power users) needed to learn the features and functions of the new system. The Communications team assumed that learning the system would not present many problems for the general calendar user. However, power users would need to learn more of the new system functions, identify which ones were new or replaced, and remember how to use them. Although this learning curve would be temporary, the program team anticipated confusion and questions until end users acclimated to the new system. The Training and Communications teams planned a variety of communications and learning aids to inform users of the new system functions and to assist them in learning how to use the new system in the ways that they preferred. The best practices and learning aides were distributed in the weeks leading to the calendar cutover, and were also made available on the IT Services Messaging Website on the Cisco intranet.

Transition Challenges

The Exchange team expected users to experience some interoperability issues over the course of the migration. For example, users might have problems retrieving legacy e-mail, have network issues, or be unable to book conference rooms. These issues would be temporary, but it was important for users to be aware of these potential problems, understand the reasons behind them, and know that they were short-lived.

The Communications team prepared to address potential operational issues by drafting communications in advance of e-mail migration and the calendar cutover. The typical approach for these communications was as follows:

- The Communications track drafted all communications, including e-mail copy, voicemail scripts, calendaring invitations, and intranet articles copy.
- Migration track leads reviewed the drafts and offered messaging and editing suggestions.
- The Communications track finalized the content for all delivery vehicles.
- Migration track leads and necessary IT management team approved the copy for distribution.

- The Communications track published or delivered the content using a variety of media.

User Readiness to Migrate to Exchange E-mail

As part of a site's e-mail migration process, users must migrate their e-mail to the Exchange system. Each site had an e-mail migration period during which users were invited to migrate at a rate of approximately 2000 per week. "During a site e-mail migration period, an e-mail message was automatically sent by Cisco Migration Manager (CMM)—a Web-based tool built by Cisco for this migration—to the group of users whom it had selected to migrate that week. The users had two options when they received the e-mail. They could schedule their migration for a time that week, or they could opt to reschedule for a different week. In order to reschedule, the users had to contact a Scheduler who was a member of the Client Migration Coordinators team. Many times the Scheduler was able to allay user concerns, answer their questions, and successfully convince the callers to migrate on schedule. If the user did not take any action, CMM would migrate the user by the end of that week," says Jerry Applegate, Cisco IT messaging migration program manager.

User Readiness to Cut Over to Exchange Calendaring

After years struggling with Meeting Maker's scheduling limitations, Cisco employees were ready to move to a true global calendaring service. However, at the same time, many users were reluctant to migrate their e-mail data to a new environment/ application or unsure of how the change would affect the functionality of their preferred e-mail application.

Objectives

The Communications track objective was to help ensure that all Cisco e-mail and calendar users (with diverse backgrounds and roles) understood why the changes were being made, how the changes would affect them, and what was required of them, and learned to be fully productive in the new messaging environment.

The charter of the Communication track team was to deliver information to all employees so that they could migrate to Exchange e-mail and calendaring, and so that they could select, configure, and use the functions of their preferred e-mail and calendaring application. Some general communications objectives included:

- Creating awareness and understanding of the Global E-mail and Calendar Program goals and objectives
- Generating acceptance of required user actions both before and after the e-mail migration and the calendar cutover
- Stimulating adoption of each user's specific e-mail migration, and the adoption of Exchange calendaring on the global cutover date
- Persuading users to read best practices and participate in Outlook training

E-mail Migration Communications Objectives

Employees were allowed to select an alternative, non-Exchange e-mail service rather than migrating to Exchange e-mail. The IT capacity planning budget allowed for less than 30 percent of all employees to choose the non-Exchange service. Since the non-Exchange e-mail alternative required duplicate infrastructure resources,

any percentage below the 30 percent target would result in financial savings from the infrastructure support and maintenance budget. As a result, the primary goal of the communications program was to influence at least 70 percent of employees to adopt the Exchange e-mail service, as follows:

- Persuade users to transition to use Outlook 2003 for e-mail
- Persuade users to migrate to Exchange in a timely manner

Calendar Cutover Communications Objectives

The following goals were specific to the calendar cutover phase.

- Generate awareness of cutover date: September 19, 2005
- Generate understanding of the cutover process from Meeting Maker to Exchange calendaring
- Persuade users to start using Exchange calendaring for roomless meetings and appointments prior to the cutover
- Help reduce effect on the Help Desk (Global Technical Response Center) for calendaring cutover support calls
- Inform selected targeted audiences that the resources/group calendars that they own will not be migrated to Exchange calendaring

Solution

Changing an enterprise's e-mail and calendaring system affects all employees. Clear communication can help users understand how the change will affect them, and can help ease the stress of the transition, gain users' support, and provide a positive migration experience. The program's clients—in this case, all Cisco employees—needed to know not only what the change would be, when the change would occur, and why it was being implemented, but also how it would affect them and what behavior they would need to change to use the new system successfully. If people understand the purpose for a change and the role that they play in it, they are more willing to respond appropriately.

"A communications specialist has three primary roles in a large program," says Nate Ratzlaff. "First, you must serve as an advocate for the people going through the change. Second, you must actively listen to the program team implementing the change. Third, you must plan an effective communications solution to bridge the gap between the needs or desires of the people going through the change and the pressures, constraints, and goals placed upon the program team."

The Cisco Global E-mail and Calendar Program manager provided a program roadmap, direction, and critical input to the Communications team lead, who then developed a global communications strategy. The Communications team lead planned and developed most program communications working closely with the Migration track leaders, the program manager, the Client Support track lead, the Information Security track lead, and the Training track lead. A Communications Deliverables Review Board consisting of these same individuals and upper IT managers approved the Exchange Deployment Communications plan.

The plan describes a comprehensive approach for communicating strategic messages to various employee groups and serves as a roadmap for planning and executing critical communications throughout the program lifecycle. Likewise, a clear and comprehensive communications plan helps the implementation team

understand when, how, and what to communicate to their constituencies to help ensure a smooth implementation.

Audience Analysis

European users had different requirements than those in other regions of the world, because Exchange had already been deployed in Europe. Users in Asia Pacific and Americas International had additional language requirements. Based on messaging needs, Cisco employees can be segmented into three groups:

- Microsoft Windows users—both entitled and nonentitled employees
- Engineers—both entitled and nonentitled employees
- Executives—all entitled employees

Microsoft Windows users and engineers can also be classified as entitled and nonentitled employees. The entitled employees are regular employees; non-entitled employees are vendors, contractors, and temporary workers. Entitled employees required information on Exchange benefits, Enterprise adoption, available training, and migration preparation, status, process, and dates.

Microsoft Windows Users

Microsoft Windows users comprised approximately 80 percent of the Cisco workforce and either used Qualcomm Eudora or Microsoft Outlook for e-mail. In general, they needed to understand the reasons why Cisco was moving to Exchange, the benefits of using Outlook on Exchange and the migration process. Most Eudora users were quite comfortable with their e-mail application, and generally did not see the need to change to Outlook. All Microsoft Windows users wanted to retain their historic e-mail data. They required directions to configure Outlook and instructions for using Outlook on Exchange.

Engineers

Engineers made up approximately 20 percent of the Cisco workforce and primarily used Evolution, Pine, Elm, /var/mail, or procmail for e-mail. Engineers did not have an interest in using Microsoft products or having accounts on a Microsoft server, had misconceptions about the reasons for the migration, and only required an Internet Mail Access Protocol (IMAP) or point-of-presence (POP) connection to the Exchange server. Engineers also needed instructions to select the non-Exchange service if they so desired.

Executives

Executives needed to understand how Exchange supported the Cisco product strategy. Non-IT executives felt that they could not afford the time required to perform their own migration, and requested special “executive red carpet” technical support to complete the process. Similarly, administrative assistants felt entitled to “red carpet” support, and required instructions to use Outlook on Exchange. IT executives, on the other hand, required regular project updates—such as timelines, issues and resolutions, and deployment information—to help ensure that they had current information for their regular meetings with other executives.

Audience Information Requirements

The audience information requirements are listed in Table 3-1.

Table 3-1: Audience Information Requirements

Audience	Information Requirements
Office of the President (OOP)	• CEO staff/support and executive administrators
Cisco Distinguished Fellows	• Over 300 engineers who have earned distinguished fellow title
Executives	• Program updates • Provide executive support/sponsorship • Premium service • Large quotas • On separate servers
IT Regional Relationship Executives	• Program updates to present to field
IT senior staff	• Program updates
Executive administrative assistants	• Early access privilege
All administrative assistants	• Use all-admins mailer list • Standard communications flow • Possible Quick Reference Guide (QRG) distribution group • Use calendaring and e-mail more than 40 percent of the time; require special instructor-led training
Building lobby ambassadors (LA)	• Some LAs will have Exchange accounts; some will not • Must be informed of early access privilege • May need to help hang posters • May need to inform their buildings of conference room booking change
Field Sales Organization (FSO)	• Success Story on Cisco@work • Must use My News-Clips to deliver announcements to FSO • Help ensure sales force is made fully aware that Meeting Maker historical data will not be migrated • Sales force is required to keep historical information for business purposes (for example, on contacts); to prevent accidentally deleting data, they may need to receive ample instruction to print out or export contact information prior to cutover, and their managers may want to help emphasize this
New York Office (and other FSO offices)	• Currently using an alternative to Meeting Maker for scheduling conference rooms. Cutting over to Exchange in December 2005. Will obtain a complete list of sites.

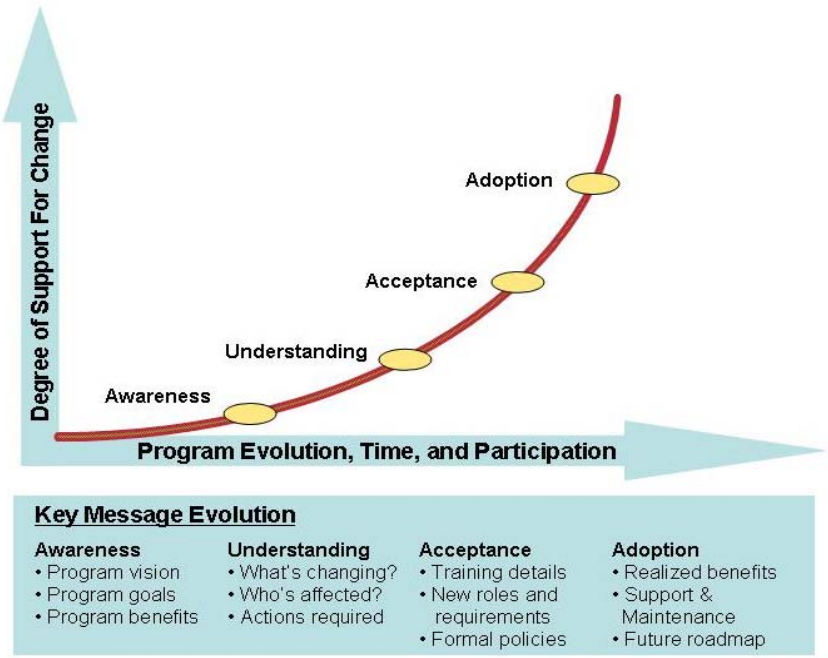
Table 3-1: Audience Information Requirements (Continued)

Audience	Information Requirements
Technical Assistance Center (TAC) (in all regions)	• Must engage regional groups individually • Some TAC groups are almost completely outsourced • Some regional clients may be willing to go through migration; participation must be decided for an entire group, not per individual
Offline Meeting Maker conference room owners/proxies	• Conference room changing status to “Online” at cutover (Workplace Resources [WPR] policy) • Plead to remove printed notices in conference rooms
Meeting Maker resource owners	• Data migration policy
Meeting Maker users (the “general” user)	• Change information—standard communications flow.
Full-time telecommuters	• Utilize Enterprise Class Teleworker (ECT) lists for targeted announcements • Not on-site to pick up printed Quick Reference Guide (QRG) in timely manner • Need to receive PDF of QRG • Not on-site to view conference room posters
European and Emerging Markets users	• Help ensure that all migrations have been completed • Determine whether the entitlement policy will be applied retroactively • Global calendaring now available!
Chinese, Japanese, and Korean users	• Translate e-mail notifications, core Webpages, and some printed materials into Chinese simplified and traditional, Japanese, and Korean
South American and Brazilian users	• Translate Quick Reference Guides to Spanish (South American), and Portuguese (Brazilian)
IT employees	• IT directors, senior staff, and spokespersons

Communications Strategy

The Communications team followed a strategy that moved targeted audiences to appropriate positions on the commitment/adoption curve, through “awareness,” “understanding,” “acceptance,” and ultimately to “adoption.” This process is shown in Figure 3-1.

Figure 3-1: Global E-mail and Calendar Communications Strategy



To gain user acceptance and adoption of Exchange messaging, the team developed communications vehicles for release at the appropriate time for each phase. For example, the initial awareness phase focused on establishing the reasons behind the global change/migration to Exchange by tying the project to a larger Cisco-on-Cisco initiative. Next, the communications detailed the steps that each user needed to take to complete his or her migration and information on how to get started working in the new messaging environment. Then, after users had become familiar with the system, communications shifted to the Training track to focus on the lesser-known features to further drive user adoption of the technology and increase productivity.

Communications Channels

The size of the global Cisco workforce and diversity of work habits and e-mail messaging behavior require equally diverse communications. For a successful deployment, it is important to understand and work within the organization's culture. At Cisco, most employees regularly access the corporate intranet for company news and information. It made sense to provide e-mail and calendar migration information in these places. However, it was also important to use a range of communications channels such as e-mail, video on demand, and posters to help ensure that the deployment information reached the widest possible audience.

When planning what type of media to use, the Communications team considered how long that type of media would be viable and the amount of information that it needed to convey. For example, e-mail is typically read and then deleted: the duration of time in which it is viable is relatively short. In contrast, an article posted on a company intranet will typically last longer and be available to users to reference, especially if it is archived. Posters displayed in lunch rooms and other common work areas can increase general awareness of the upcoming program, while Websites and e-mail content can deliver more detailed information.

The Communications team used a variety of media to convey their messages, including e-mail, voicemail, articles, newsletters, asynchronous videos on demand (VoD), and online presentations (see Figure 3-2 and Figure 3-3). It was important to have a variety of communications options and channels because one channel or option cannot do it all. Only after a program generates critical mass with its flow of information do users start to pay attention.

Figure 3-2: Communication Channels Used during the E-mail Migration

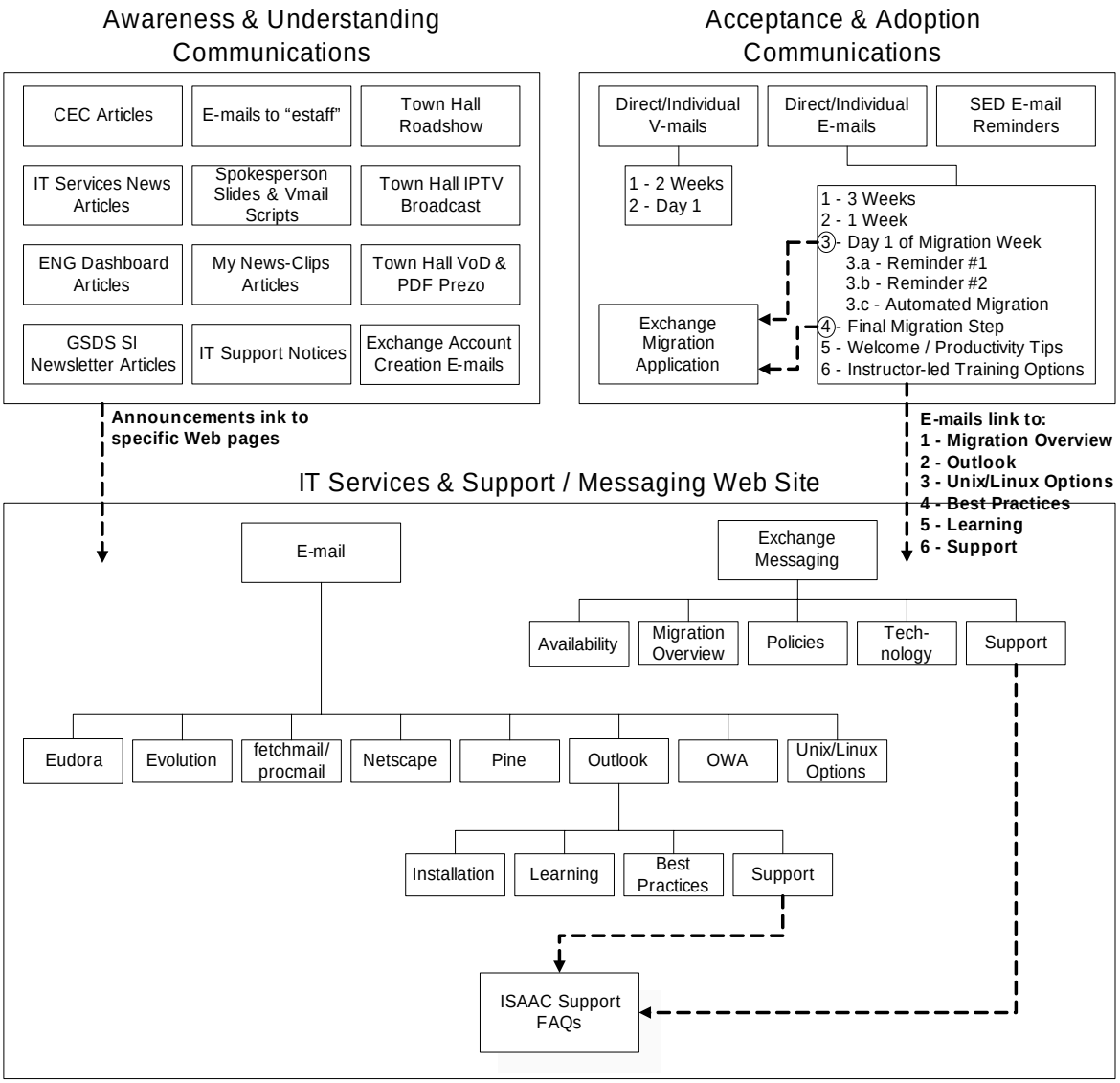
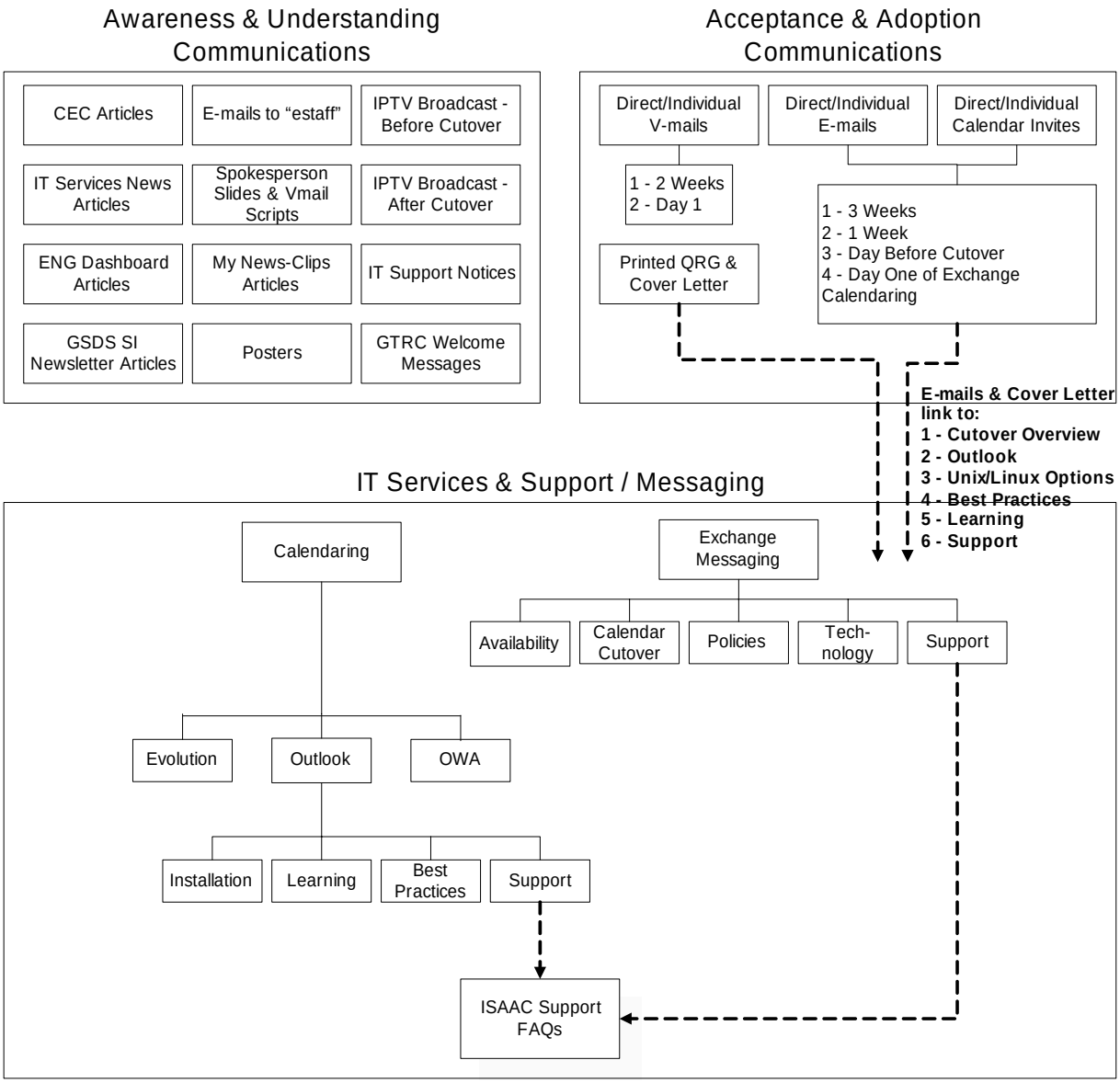


Figure 3-3: Communication Channels Used during the Calendaring Cutover



E-mail Migration Key Messages

The following key messages were used during the e-mail migration:

- Cisco is implementing Exchange messaging to help showcase Cisco products, such as Cisco MeetingPlace and Cisco Unity.
- Exchange offers a flexible e-mail environment where employees can choose their preferred e-mail application (both Microsoft Windows and non-Windows) to connect to Exchange.
- Cisco is now starting to migrate employees to Microsoft Exchange e-mail.
- When all e-mail migrations are finished in a region, Exchange calendaring will replace Meeting Maker as the global calendaring solution at Cisco.
- The global migration to Exchange e-mail at Cisco is targeted for completion in mid to late 2005.
- Employees will be notified to perform their migration to Exchange based on the predefined schedules for each global region: United States, Americas International, Asia Pacific, and Japan.
- Employees will receive two sets of e-mail notifications, one set for each stage of their migration. In brief, notifications will include information about the Exchange account creation and the e-mail and calendar migration.
- All employees should review the e-mail and calendar migration overview for complete details.
- Engineers should review the “UNIX & Linux E-mail Options” Webpage for connection instructions.
- Exchange e-mail policies included Mailbox quotas and Exchange rules limit.

In addition, the messages in Table 3-2 were prepared to target specific Microsoft Outlook 2003, Qualcomm Eudora, Novell Evolution, and Microsoft Outlook Web Access (OWA) users:

Table 3-2: Messages Directed at Users of Specific Clients

E-mail Option	Key Message
Microsoft Outlook 2003	Outlook 2003, when used with a Messaging Application Programming Interface (MAPI) connection, provides integrated e-mail and calendaring for the most functionality available on Exchange: • The profile script used at the end of the Exchange e-mail migration automatically created a MAPI profile for Microsoft Windows users. • Outlook 2003 users utilizing a point-of-presence (POP) or Internet Message Access Protocol (IMAP) connection may need to create an Exchange Rule that moves incoming calendaring messages to a server-side folder outside the Inbox.
	• Outlook 2003 users should complete Outlook 2003 training to maximize their productivity of Outlook on Exchange.
	• Outlook 2003 users should utilize the Outlook 2003 Quick Reference Guide (QRG) as a desktop learning tool that can help decrease the Outlook learning curve and increase productivity.
	• Outlook 2003 users should review the Outlook 2003 calendaring Best Practices to increase productivity.

Table 3-2: Messages Directed at Users of Specific Clients (Continued)

E-mail Option	Key Message
Qualcomm Eudora	Eudora will soon reach its end of life at Cisco. While Eudora users may continue to use Qualcomm Eudora for e-mail on Microsoft Exchange–and can use either Microsoft Outlook 2003 or Outlook Web Access (OWA) for calendaring–they should consider starting to use Microsoft Outlook 2003 for both e-mail and calendaring for integrated messaging.
	Eudora users utilizing a POP or IMAP connection may need to create an Exchange Rule that moves incoming calendaring messages to a server-side folder outside the Inbox.
Novell Evolution/ Microsoft OWA (Linux users)	Linux users may use either Novell Evolution calendaring or Microsoft OWA to access the Microsoft Exchange calendar.
Novell Evolution	Novell Evolution provides a basic set of calendaring functionality, yet it emulates the core set of Microsoft Outlook 2003 functionality.
	Novell Evolution users utilizing a POP or IMAP connection may need to create a Microsoft Exchange Rule that moves incoming calendaring messages to a server-side folder outside the Inbox.
Microsoft Outlook Web Access (OWA)	Outlook Web Access OWA provides limited calendaring (and e-mail) functionality, yet it emulates the core set of Outlook 2003 functionality and Outlook design.
	Users must be connected to the corporate intranet to access OWA – either via a direct connection or through a Virtual Private Network (VPN).
	Information Security policies do not yet allow for accessing OWA from outside the corporate intranet.
	OWA users should complete training to maximize their productivity.
	OWA users should utilize the OWA QRG as a desktop learning tool that can help decrease the OWA learning curve and increase productivity.
	(OWA users should review the OWA calendaring Best Practices to increase productivity.

Calendar Cutover Key Messages

This section lists the key messages were used during the calendar cutover.

Key Terms to Use

The following terminology was used in key messages:

- Exchange global calendaring
- Conference room booking
- Roomless meetings and appointments

Strategic Key Messages

The following key strategic messages were delivered:

- Exchange global calendaring will replace Meeting Maker for conference room booking.

- Employees may use Exchange calendaring for roomless meetings and appointments as soon as they complete their migration to Exchange e-mail.
- Meeting Maker servers will be decommissioned (that is, unavailable) immediately following the calendaring cutover. No new Meeting Maker accounts will be created after [date], without exception. After the cutover, users will be able to access Meeting Maker client/application via the “Work Offline” mode.
- Cisco is implementing Exchange messaging to showcase future integration of Cisco products, such as MeetingPlace and Unified Messaging.

Calendar Cutover Key Preparation Messages

The following messages were delivered to prepare users for the cold cutover from Meeting Maker calendaring to Exchange calendaring.

- Due to Meeting Maker’s proprietary data structure, Meeting Maker data will not be migrated to Exchange calendaring.
- The “cold cutover” approach will be a rough change, but it provides everyone with the opportunity to start using Outlook calendaring with a clean/clear schedule.
- Employees should be courteous to their colleagues and only book conference rooms in Exchange for required times and durations. Be courteous to your colleagues. Allow everyone the opportunity to book conference rooms in Exchange.
- Users should print their schedule for the week after the scheduled cutover weekend. Users should print their Meeting Maker schedule for September (and perhaps October) immediately prior to the cutover weekend.
- Executive administrators (EA), power users and lobby ambassadors (LA) will receive “early access privileges.”
- EAs and power users will have access to Outlook servers approximately 30 days prior to the cutover weekend.
- LAs will have access to Outlook servers approximately 7 days prior to the cutover weekend.
- Exchange calendaring will be available on September 19, 2005.
- Americas International, Asia Pacific, Japan, United States, and Canada will cut over at the same time.

Tactical Messages for Calendaring Policies

The calendaring cutover is governed by several policies put into place by IT and several business partner organizations, including Human Resources and Work Place Resources.

- Online/Offline conference room policy (WPR): offline conference rooms have an owner that must approve all reservations. All online rooms can be booked by any employee.
- Open a WPR support case to request “Offline” status for a conference room.
- No conference room asset resources will be available on the Global Address List (GAL); this will be examined in the future. Data will not be migrated at this time.
- Multipoint Control Units (MCU)—such as video conferencing equipment, TVs, and VCRs—will be available in Exchange calendaring
- Data will not be migrated from Meeting Maker to Exchange calendaring.
- Local holidays and payroll information will not be immediately available in Exchange calendar.

- After the global cutover from Meeting Maker to Exchange global calendaring, Cisco IT will investigate the possibility of updating Exchange to highlight local holidays and payroll dates.
- Cisco operates in a vast number of countries around the world—many with unique holidays and payroll dates—so IT is researching a holiday and payroll information solution that will work for all regions.
- A target availability date for holiday and payroll information has not yet been identified. This option is not being considered until late 2005, and is separate from the Global E-mail and Calendar Program; basically this will be a new project.

Executive Sponsorship

Sponsorship from top management is important to the success of any major technology deployment that affects a large population because that technology must be linked directly to key business goals and initiatives. Senior executives can help resolve high-level issues and gain support from those affected by the changes that occur as a result of the deployment. Conversely, lack of a sponsor or champion in the organization can impede success.

The Communications team developed a communications strategy that was directed at senior executives, yet also enlisted them to support the deployment by delivering migration-related messages to their teams.

Unity Personal Assistant was used to record and distribute executive voicemails. Brad Boston, Cisco Chief Information Officer (CIO), recorded a short e-mail and voicemail, reminding users. This was attached to a new voicemail and e-mail to deliver the wav files. This method provided executive sponsorship in a constantly changing, tactical communications delivery process.

“One of the key success factors in enterprise deployments is clear executive understanding of how new technologies will help meet business objectives,” says Brad Boston, CIO. “This knowledge unifies management groups, enabling them to more clearly and proactively communicate the business value of new applications to their departments. This clear communication cascades throughout the organization, improving teamwork and helping users embrace change instead of resisting it.”

Language Translations

The following table shows the different language translations used in the e-mail and calendar migration.

Region	E-mail Migration	Calendar Cutover
Asia Pacific	Korean Japanese Chinese Simplified Chinese Traditional	Korean Japanese Chinese Simplified Chinese Traditional
Americas International	None	Spanish (South American) Portuguese (Brazilian)

Exchange Messaging, E-mail and Calendaring Websites

A dedicated Exchange Messaging Website was created on the Cisco IT Services intranet to keep employees informed of the e-mail and calendaring application options available on Exchange, training offerings, best practices and support resources, policy information, and step-by-step instructions of the e-mail migration and calendaring cutover.

Website Information Architecture

The Messaging Website Information Architecture (IA) provided a logical organizational structure of the massive amount of content available to readers. Given that all communication deliveries linked to the Website, the IA and Website content was truly the cornerstone of the communications success. For a detailed description of the architecture, see "Messaging Website Information Architecture" on page B-2.

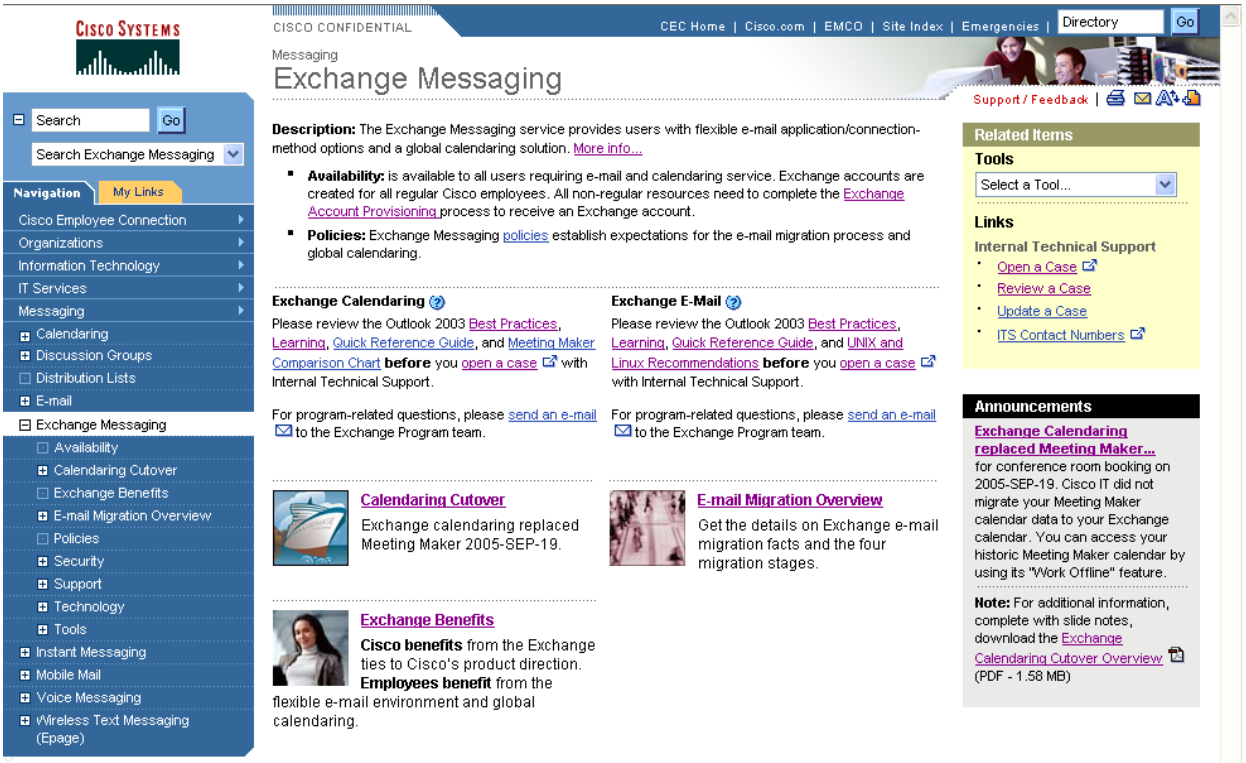
A summary outline of this architecture is as follows:

- IT Services E-mail and Messaging
- Calendaring—Meeting Maker, Evolution, Outlook 2003, Outlook Web Access (logging into OWA), and Technology
- E-mail—Best Practices, Installation, Learning, New Features, Improvements, Policies, Support, and Technology for the following applications and platforms:
  - Qualcomm Eudora
  - Netscape and Mozilla
  - Microsoft Outlook 2003
  - Outlook Web Access (OWA)
  - UNIX and Linux
- Exchange Messaging—Availability, Exchange Benefits, Calendaring Cutover, E-mail Migration Overview, Policies, Security, Support, Technology, and Tools

Exchange Messaging Website

A dedicated Exchange Messaging Website was created on the Cisco IT Services intranet to keep employees informed of the program progress, next steps of the deployment, and available training and support resources, as well as best practices, guidelines, and Quick Reference Guides. Figure 3-4 shows the IT Messaging Services Website homepage.

Figure 3-4: Exchange Messaging Website

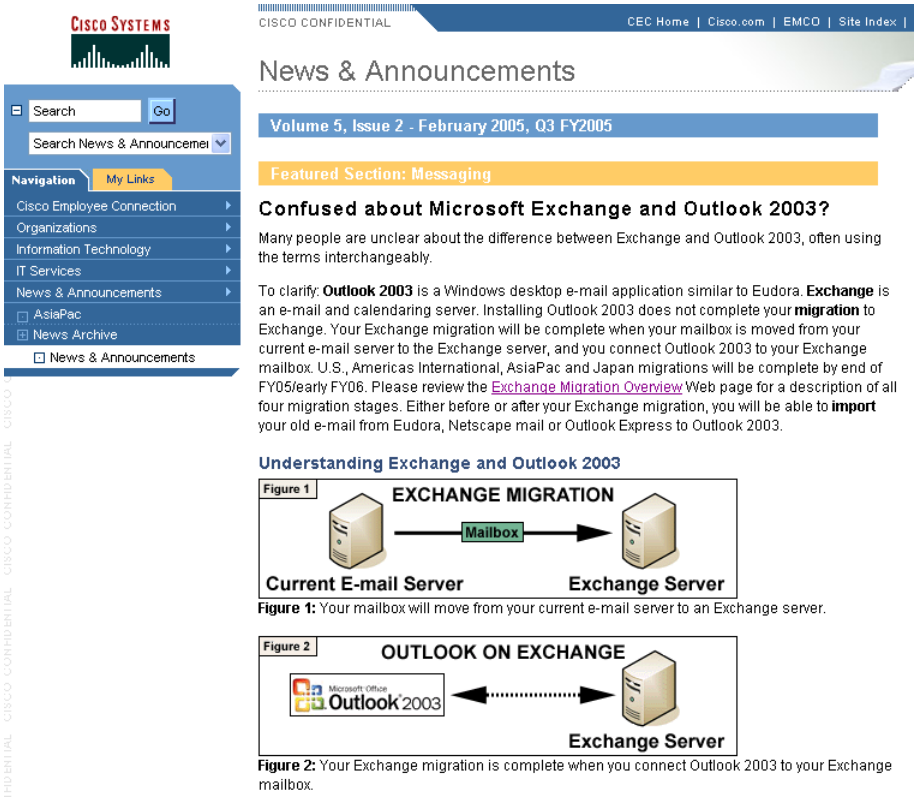


Newsletters, IPTV Broadcasts, and Posters

Articles, Newsletters, and Presentations

Articles, newsletters, and presentations are all good ways to raise awareness and generate interest about a technology deployment. To help ensure that the Global E-mail and Calendar Program team was effectively delivering meaningful information about the implementation to the various user groups at Cisco, the Communications team first identified all possible communications channels. For example, the home page of the Cisco intranet was a good option for reaching most Cisco employees, as shown in Figure 3-5. The information needed to be tailored for different audiences, depending on their specific needs and interests.

Figure 3-5: News Article Posted in the Services Website



IPTV Broadcasts

IPTV sessions on Outlook calendar were offered in different time zones both before and after the calendar cutover (see Figure 3-6).

Figure 3-6: IPTV Broadcast Sessions Offered during the Calendar Cutover

Calendaring Cutover

IPTV Broadcast Schedule

Support / Feedback |

Tune into an IPTV session before the cutover to receive an overview of the calendaring cutover process, available calendaring applications and learning options. After the calendaring cutover, watch a brief IPTV session for a demonstration of the core calendaring functions in Outlook 2003 and OWA.

IPTV Broadcast Schedule

Visit the CiscoTV Guide to launch a live broadcast.

Pre-Cutover			Post-Cutover		
Calendaring Cutover Overview (60 min.)			Exchange Calendaring Demonstration – Outlook 2003 & OWA (60 min.)		
Broadcast 1	**2005-SEP-12** (Monday)	▪ San Jose - 10:00 PDT	Broadcast 1	**2005-SEP-19** (Monday)	▪ San Jose - 10:30 PDT
	2005-SEP-13 (Tuesday)	▪ Singapore - 01:00 ▪ Japan - 02:00 ▪ Sydney - 03:00 EST		**2005-SEP-20** (Tuesday)	▪ Singapore - 01:30 ▪ Japan - 02:30 ▪ Sydney - 03:30 EST
Broadcast 2	**2005-SEP-14** (Wednesday)	▪ San Jose - 13:00 PDT	Broadcast 2	**2005-SEP-19** (Monday)	▪ San Jose - 13:00 PDT
	2005-SEP-15 (Thursday)	▪ Singapore - 04:00 ▪ Japan - 05:00 ▪ Sydney - 06:00 EST		**2005-SEP-20** (Tuesday)	▪ Singapore - 04:00 ▪ Japan - 05:00 ▪ Sydney - 06:00 EST
Broadcast 3	**2005-SEP-15** (Thursday)	▪ San Jose - 16:00 PDT	Broadcast 3	**2005-SEP-19** (Monday)	▪ San Jose - 16:00 PDT
	2005-SEP-16 (Friday)	▪ Singapore - 07:00 ▪ Japan - 08:00 ▪ Sydney - 09:00 EST		**2005-SEP-20** (Tuesday)	▪ Singapore - 07:00 ▪ Japan - 08:00 ▪ Sydney - 09:00 EST
Broadcast 4	**2005-SEP-15** (Thursday)	▪ San Jose - 18:00 PDT	Broadcast 4	**2005-SEP-20** (Tuesday)	▪ San Jose - 18:00 PDT
	2005-SEP-16 (Friday)	▪ Singapore - 09:00 ▪ Japan - 10:00 ▪ Sydney - 11:00 EST		**2005-SEP-21** (Wednesday)	▪ Singapore - 09:00 ▪ Japan - 10:00 ▪ Sydney - 11:00 EST
			Broadcast 5	**2005-SEP-21** (Wednesday)	▪ San Jose - 13:00 PDT
				2005-SEP-22 (Thursday)	▪ Singapore - 04:00 ▪ Japan - 05:00 ▪ Sydney - 06:00 EST

Calendar Cutover Poster

The calendaring cutover project team used a Nautical/Cruise liner theme with the title “Welcome Aboard!” This theme was repeated in the design of the poster and in the Exchange Calendar Website (see Figure 3-7).

Posters were used at deployment sites to promote the cutover to Exchange messaging. “Posters are a great communications medium when using a visual theme to help tell the story of the change. As a result, they can generate a stronger recognition of the program than only using words,” says Ratzlaff. The Calendar Cutover poster used a Nautical/Cruise liner theme and showed an ocean cruise liner setting sail from the harbor. The posters were distributed through WPR (facilities), rather than directly by the Communications team. However, it could not be verified at a given time whether the posters had been placed in a given location; therefore, the team could not count on that information being transmitted to the user.

Figure 3-7: Global Exchange Calendar Migration Poster

Feedback Mechanisms

Various tools were used to obtain user feedback. E-mail and voicemail aliases were provided to users. The number of page hits was tabulated to determine how many users were utilizing the learning resources and best practices, and reading the articles.

- Two e-mail aliases provided channels by which users could voice concerns, ask questions, and request information. During the e-mail migration, xch-feedback@cisco.com was used as the primary feedback mechanism. Similarly, xch-calendaring-feedback@cisco.com was used during the calendar cutover. The e-mail aliases were used as follows:
  - Available on all IT Services Calendaring Webpages
  - Included in all awareness/understanding announcements
  - Used as the “reply-to” address in all e-mail and calendaring invitation notifications
- A voice alias was set up so that end users could request information or help, and receive a swift response. A Unity voice mailbox was used as the “reply-to” mailbox in all voice mail notifications.

Communications Plan

“The communications schedule (that is, the table of communications tactics) is really the end result of all the prework completed in the audience analysis, delivery channel, delivery timing and key messaging planning phases,” says Ratzlaff. “In addition, when identifying the appropriate channels for each audience segment, you should build relationships with the appropriate people responsible for those channels. Undoubtedly, they can help distribute the communications in a timely manner. Large corporations often have several approval process layers for publishing or distributing content, such as Websites, Web articles, e-mail, voicemail, and printed collateral.Relationships with key people can really help the Communications lead stay on-track with the communications schedule, and can help speed up the approval process when needed.”

The communication strategy was defined in part by the limited communication budget, and was divided into two phases: one to generate general awareness and understanding of the upcoming change, and one to systematically move employees from acceptance to adoption of the Exchange e-mail service. The Cisco Migration Manager (CMM) application—created by IT developers——automatically delivered individual e-mail notifications to employees, updated voicemail distribution lists, and performed all of the technical background processes required to transition an employee’s account to the Exchange server. Using both e-mail and voicemail allowed the team to capture the attention of employees who preferred e-mail over voicemail and visa versa. The weekly delivery process gradually prepared employees for the change rather than sending fewer, longer e-mails. The weekly delivery process also provided advanced notice to employees who were absent for an extended period of time, such as for vacation, training, or conferences. For a detailed description of this plan, see “Communications Plan” on page B-6.

Communications Metrics

The following table provides raw metrics on the different communication channels in terms of page hits, delivery count, and number of communications delivered.

Tactic	Number	Page Hits or Visitors	Delivery Count
Direct E-mail	12		479,896
Translated E-mail (content on the Web)	14	6,669	
Direct V-mail	4		~292,000
Calendar Invitations	2		83,704
IT Services / E-mail Website		379,004	
IT Services / Calendaring Website		60,582	
IT Services / Exchange Messaging Website		142,429	
Translated Webpages	7	TBD	
CEC Articles	7	43,963	
IT Services News Articles (monthly)	12	56,521	
Spokesperson Voicemail (monthly)	10		~10,000
Posters	1		2,250
Town Halls, IPTV, Video on Demand (VoD)	37	~2,650	
Outlook 2003 Printed Quick Reference Guides	1		32,000

Measuring the Value of Communications

Although measuring the value of the entire communications program was not possible, the Communications track lead made an effort to evaluate the effective return on investment, or communications effect, associated with the infrastructure savings realized due to the high adoption of the Exchange messaging service. This section describes the evaluation process, metrics, and the associated return on investment.

Measurement Overview

Forty thousand employees were scheduled to go through the migration, and 12,000 (equal to 30 percent) were budgeted to select the non-Exchange e-mail service. 13,400 total engineers were scheduled to migrate. Based upon preproject research, IT forecasted 10,400 engineers (75 percent of all engineers) would select the non-Exchange option. Using sample size theory (95 percent confidence level, 75 sample size, and 15,000 population), the team was 95 percent sure that 75 percent of engineers (+/- 11.29 percent) would select the nonExchange e-mail service. In the end, however, only 40 employees selected the nonExchange e-mail service. IT

planned to spend $300,000 for nonExchange servers. Three servers were initially built for $60,000. As a result, IT Infrastructure saved $240,000 due to the increased Exchange adoption.

The communication effect was initially quantified by comparing the unique user hits to the UNIX & Linux E-mail Options Webpage with the unique engineers who attended the Town Hall, IPTV broadcast, or Video on Demand presentations. The passive versus active reach metrics were then used to factor the range of influence on the increased Exchange adoption and subsequent IT Infrastructure savings.

Exchange Adoption Rates by Engineers

Metric	Exchange Accounts (percent)	NonExchange Accounts (percent)
Forecasted Adoption	22.39	77.61*
Actual Adoption	99.62	0.38

***Note:** Total percentage of engineers who could choose non-Exchange, if all budgeted opt-out users were engineers.

Result: Communications helped achieve a 77.23 percent (99.62 minus 22.39 percent) gain between the forecasted and actual adoption rates of Exchange.

Passive Communications Reach to Engineers

Metric	UNIX/Linux E-mail Webpage
Unique Webpage Visitors	10,136
Engineering Reach (of 13,400 engineers)	75.64 percent

Result: It was determined that 75.64 percent of engineers read the UNIX/Linux E-mail Options Webpage before their migration.

Active Communications Reach to Engineers

Metric	Town Halls, IPTV, and VoD
Unique Attendees/Viewers	2,100
Engineering Reach (of 13,400 engineers)	15.67 percent

Result: It was determined that 15.67 percent of engineers attended an Engineer Town Hall meeting, watched the IPTV Webcast, or viewed the VoD on-line either before or during their migration. When the unique names from the passive and

active lists were combined without overlap, the communication content reached 91.31 percent of all engineers.

Communication Effect on Engineers

Metric	Reach (percent)	Adoption Increase (percent)	Communication Effect (percent)
Passive Communication	75.64	77.23	58.42
Active and Passive Communication	91.31	77.23	70.52

Result: It was concluded that communication was responsible for increasing adoption between 58.42 percent (low) and 70.52 percent (high) of the 77.23 percent adoption gain.

Communication Value

Based upon the measurement criteria outlined above, communication was responsible for $181,540 (low) to $219,152 (high) of the $240,000 IT Infrastructure savings.

Communications Return on Investment (ROI)

Based upon the actual communication budget, $13,885.22, and the Communication Value, $181,540 to $219,152, the communication project ROI ranged from 1307.43 percent (low) to 1578.31 percent (high).

Factoring Communications Personnel Cost in Return on Investment (ROI)

If the communication personnel resource cost, $36,562, were factored into the communication budget, the actual communication budget would have been $50,447. In return, the communication project ROI would have ranged from 359.85 percent (low) to 434.41 percent (high).

Lessons Learned

The lessons learned in developing the Global E-mail and Calendar Program communications solution included the following:

What Was Good

- General awareness campaign—This campaign included CEC and IT Services news articles, IT support notices, spokesperson updates (voicemail scripts and slides), Town Hall road shows, and CiscoTV (IPTV) broadcasts/VoD.
- Exchange messaging—E-mail and calendaring IT Services Websites received many visitors and answered many of the frequently asked questions.
- Utilizing e-mail, voicemail, and calendar meeting requests for direct delivery.
- Integrating direct e-mail delivery process into CMM for e-mail migration saved time and resources.
- Consistent messaging—General awareness announcements, direct delivery, migration application content (CMM), OnRamp tool was used for “entitlement validation” of content, (e-mail new account process was updated just before the calendaring phase). Developed new scripts used for new account requests and training notifications and content.
- Language translation—Chinese simplified and traditional, Korean, Japanese, Brazilian Portuguese, and Spanish (South American). The approximate number of employees that benefited was low: about 40 or 50 users total. In Japan, out of 1100 users, only 50 opened the translated version. It was a good gesture, but not very cost-effective.
- The printed Outlook 2003 Quick Reference Guides required a lengthy lead-time for international delivery. The calendar Quick Reference was sent via internal mail with a cover letter. The e-mail Quick Reference was accessible through the IT Services Website.
- The subject matter experts drafted the technical content, which was then edited and published to the Web by the Communications lead. This expedited the delivery of the material and saved additional content development resources. The content was authored and edited by different groups.
- Unity Personal Assistant was used to record and distribute executive voicemails. Brad Boston recorded a short e-mail and voicemail, reminding users. This was attached to a new voicemail and e-mail to deliver the wav files. This method provided executive sponsorship in a constantly changing, tactical communications delivery process.

What Was Not So Good

- The Global E-mail and Calendar Program team waited too long to finalize the calendaring cutover approach. Because the decision took so long, only one month was left to develop awareness. Managers were concerned about the cold cutover and wanted to research all possible options.
- It was not possible to measure the usage of IT spokesperson presentation slides. Every month, the slides were updated and sent to management with resolutions and issues. Although it required a lot of preparation time, it could not be determined if it was being used by the spokesperson organization.
- Poster hanging had to be managed by WPR (facilities), which required a very long lead time. After posters were printed, they were given to WPR to distribute with a 4-week lead time, but it was difficult to determine if they were all hung.

- Postcards were not used because of cost. They would have been sent through mailboxes.
- IT Support FAQ informal content format was not consistent with IT Services site style/format. There was too much content for the Communications group to manage. Help Desk (GTRC) analysts did not edit their FAQs and seemed unaware of IT Services site content.
- Separating executive audience communications from general user audience communications. The Red Carpet support team wanted to manage the communications to executives. It was difficult to know if communications were being delivered or what exactly was being delivered. Learned that it is necessary to stay closely aligned with special audience support team.
- E-mail was sent to administrative assistants with program updates or specific information about how to manage e-mail migration, and they were asked to forward it to their group dot alias. Users cannot send a broadcast e-mail at Cisco; the easiest is to work through the administrative assistants. A group of employees is most likely to read the e-mail from their administrative assistant. Administrative assistants, however, did not follow through with the requested e-mail forwarding. Fortunately the material was bonus material and not critical to the operation.
- Needed technical writing support to develop and maintain “how to” and Best Practices content. The Communications team did not have sufficient resources to provide additional support. Relationship building could have been handled by the Communications track lead, and the content writing could have been given to someone else.
- It was challenging to communicate with the engineering community (UNIX/Linux users). They could not be relied upon to read direct e-mails and/or Web content. It became necessary to meet with them face-to-face. One drawback was that the engineering management was not included in the dissemination of information. It would have been a good idea to establish a partnership with the leadership and rely on them to spread the word.
- The engineers had many misconceptions about the e-mail and calendar migration. The Communications team monitored different e-mail aliases used by engineers to find out what information they had misconceptions on. The engineers needed to understand that the migration was not just about Outlook and that they had other options. Effort was made to include information on UNIX/Linux, and OWA.
- Town Halls worked to some degree in communicating with engineering groups. The Town Halls were directed at engineers. They were conducted in centralized engineering buildings and announced via building aliases; the audience could include nonengineers. Program track leads explained the e-mail and calendar migration and described the deployment process. At one Town Hall meeting, an Engineering VP and a Marketing VP provided backing on the need for this effort. Out of a total of more than 13,000 engineers, approximately 2000 attended the Town Halls, including live IPTV broadcast and VoD.

MODULE 4

How Cisco Migrated Nearly 40,000 Mailboxes in 16 Weeks

Content

Overview

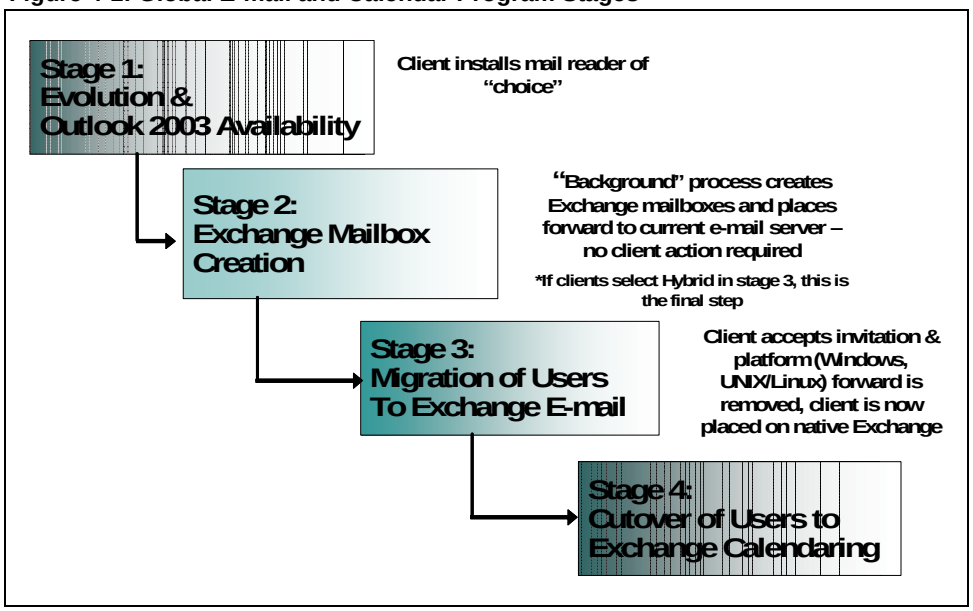
This module describes the e-mail migration and calendar cutover processes behind the Cisco IT migration to Microsoft Exchange Server 2003 within the Cisco global network. The deployment of the Exchange infrastructure is discussed in the Architecture module, while this module specifically discusses the e-mail migration and calendar cutover.

The migration process consisted of four stages:

1. Deploy Exchange 2003 Servers to five sites worldwide using a pod-based architecture. Make available for installation Microsoft Office 2003 (including Outlook) and Novell Evolution (for Linux users).
2. Develop an automated process to create Exchange mailboxes and to connect client e-mail software to the mailboxes—including developing a Web-based workflow communications tool incorporated with the mailbox provisioning.
3. Migrate e-mail clients and legacy e-mail data to Exchange.
4. Implement calendar cutover from Meeting Maker to Exchange calendaring, which includes working with facilities (Workplace Resources) to automate the process by which conference rooms become available to Exchange users.

Figure 4-1 illustrates the four stages of the migration process.

Figure 4-1: Global E-mail and Calendar Program Stages



Migration & Implementation Tracks

The Global E-mail and Calendar Program consisted of a global cross-functional team with members chosen for their expertise in various disciplines and functions needed to further the initiative. In addition to the program manager, each track had its own leader.

Client E-mail Migration Track

The Client Migration Track team managed automation, scheduling, and client communications. There was one global Messaging Manager, and each region had a separate subteam and local project manager:

- US/Canada and Americas International project manager
- Asia Pacific project manager
- European and Emerging Markets project manager

Calendar Cutover Track

The Calendar Cutover Track team managed the cutover from Meeting Maker to Exchange calendar. This cutover included both coordination with the Cisco facilities department, called Workplace Resources (WPR), to populate the global address list with official conference rooms and coordination with related training and support.

Automation/Tools Track

The Automation/Tools Track team focused on process automation—Client Migration Management (CMM) and back-end processes—migration status tracking, and overall integration with the IT infrastructure.

UNIX/Linux Client Track

The UNIX/Linux Track team focused on addressing the e-mail and calendaring needs of the large community of UNIX and Linux platform users, including developing tools, performing functional testing, and providing support.

Challenge

The following challenges needed to be addressed during the migration phase:

- A centralized user and facility data repository was needed for Active Directory.
- Because there were a large number of employees to migrate to the new Exchange-based system (approximately 40,000), parts of the migration process required automation.
- Support had to be integrated with the pace of migration so that employees could be supported as soon as they were migrated.
- User training also had to be integrated with the pace of migration.
- Effect on the user needed to be minimized.
- Since workplace resources—such as meeting rooms—could not be booked in two different systems at the same time, Cisco IT needed to cut an entire region over from Meeting Maker to Microsoft Exchange calendaring on a single day.
- Outlook provided new limitations to which users needed to adapt.

Centralized Data Repository

Before the migration critical data such as user data, server data, and conference room data were not centralized into a single repository. Because Exchange is tied to Active Directory, a single repository for all user accounts had to be created. The user account repository was designed so that the data could only be updated directly from HR data and not through manual intervention. Client roles, profiling, and identification data were stored here.

Large-Scale Migration

Migrating nearly 40,000 users in the span of a few weeks was a big challenge. A process needed to be automated to tackle a large-scale client migration. The communications needed to be automated and preferably integrated with the migration automation. The migration had to be paced sufficiently to allow for a reasonable number of support personnel to be on hand to resolve problems and answer questions. Support also had to be in place to handle the inevitable exceptions. To make the migration experience as smooth and pleasant as possible, the process needed to be flexible enough to allow users a choice of when to migrate their data within a given time frame.

Adequate Support for Migration Schedule

Support would set the pace for the migration in terms of the number of users who could be supported. Throughout the migration, sufficient support had to be available to answer questions and resolve issues. Because the users would be dealing with a new application, Outlook, and a new e-mail system, it was anticipated that each support call could take approximately 20 minutes. Because the migration had to be accomplished within a few weeks, and the number of dedicated support personnel was limited, the challenge was striking a balance between speed of migrations and adequate support. In addition, the existing support personnel also had to be trained in the new system so there would be adequate coverage.

User Training Synchronized with the Migration

Client training had to be integrated with the pace of migration. The more adequate the training, the fewer calls to support would be made. Also, the users would be more responsive to migrating on schedule. Users also needed to understand how to use the tools and the new e-mail and calendar features so they could be productive immediately following the migration.

Maintaining Availability of E-mail and Calendaring to All Users

The goal was to maintain functionality at all times during the migration. Users could not have their e-mail and calendaring systems disrupted because of the huge effect on employee productivity and on outside business.

"It was essential to develop a migration strategy that minimized disruption to users, yet supported an aggressive schedule to obtain the benefits of global scheduling," says Jerry Applegate, Cisco IT messaging migration program manager. "Transferring user e-mail accounts to Exchange was a prerequisite to using the Exchange calendar. While e-mail accounts could be migrated on a user-by-user basis, the calendar migration had to take place at the same time for all users in a geographic region. This resulted in two distinct strategies on which the overall plan was based."

A primary requirement was that at all times during the migration, all end users must be able to send and receive e-mail and use calendaring services. Messaging services are used heavily by everyone at Cisco, and calendaring is used especially by managers, team leaders, and the administrative staffs, who consistently book conference rooms and schedule meetings.

A flash cut approach could not guarantee that e-mail would not be disrupted. The approach selected would greatly affect the Cisco IT support staff, who would be unable to adequately provide training and service to so many end users at the same time without an unreasonable, although temporary, personnel increase. For all these reasons, the flash cut approach was considered an infeasible migration strategy for the e-mail system.

New Features and Limitations

Outlook 2003 would provide users with great new features not available in their legacy system, but it would also challenge them to adapt to new limitations.

Great New Features in Outlook	Trade-offs with Legacy System
• Easy to share items, such as contacts folders • Side-by-side calendars and scheduling groups • Attachments in meeting/events • Local time zones displayed and supported • Search folders • Offline address book • Journal • Tasks • Follow Up Flags • Much more	• Quotas: Going from POP to Client/Server imposes a limit on mailbox (synchronized with the server) of 450 MB per employee. • Need to archive: The mailbox has a good auto-archive feature but it takes some training to get the desired results. • Meeting Series is somewhat rigid compared to Meeting Maker. It is easy to lose changes to prior meeting instances (single meetings versus the series). • Rules/Filters are limited: only around 50 filter rules can be created. • Formats: Supports HTML or Plain Text only, not Rich Text Format (RTF).

Calendar Cutover Challenges

Some of the calendar cutover challenges were as follows:

- The conference room data stored in Meeting Maker was inaccurate—including double entries and an inconsistent naming convention—and was out-of-date when compared to the facilities (Workplace Resources) data. The facilities database did not use a consistent naming convention either, which resulted in a redesign and clean-up effort on both sides.
- The volume of Meeting Maker data to be migrated for Cisco within the United States, the Americas, and the Asia Pacific regions was much higher than the Meeting Maker data for the European and Emerging Markets, which Cisco IT had migrated to Exchange earlier. The European and Emerging Markets cutover had been for only 6,000 users, while the cutover for the other regions resulted in nearly 40,000 users; therefore, the team did not have a comparable model for this new and much larger effort.

- Importing data from Meeting Maker could not affect the e-mail flow during a business day. If the same data import solution had been used for this global cutover as was used in the European and Emerging Markets, it would have resulted in an Exchange Server downtime window in excess of seven days.
- The Exchange calendar was available soon after the servers were in place, but rooms could not be booked until all e-mail migrations were completed and the cutover of conference rooms was completed. This caused a lot of confusion and presented a client education challenge.
- An older version of Meeting Maker was operational at Cisco, which meant that not all data fields could be mapped from Meeting Maker to Exchange.
- The data migration solutions investigated did not meet all the requirements. Since Cisco had the largest installation of Meeting Maker prior to the cutover to Exchange, a cutover the size of Cisco could not be proved by the vendors approached to perform this data migration.
- A client-only migration tool could be developed, but proved challenging. Such a tool would have only imported meeting data as appointments and not as meetings (such as no attendees and meeting rooms). As a result, all the data imported with a client-only import tool would have needed to be updated after the import.

Solution: Exchange Client Migration

This section describes the Exchange E-mail migration plan, client migration implementation schedule, tools required to facilitate migration, and basic e-mail migration process.

Exchange Client Migration Plan

This section describes the client migration plan requirements, schedule, waves, phases, rates, and number of users.

Basic Requirements

The following were the basic requirements for client migration:

- Use a client-friendly approach where the client determines the “moment of” migration.
- The program drives the overall schedule; therefore, reasonable limits need to be set.
- Process should be reliable, scalable, and supportable.
- As much should be done up-front as possible; as little as possible during the migration.

E-mail Migration Strategy

“The team determined that a realistic goal would be to convert users by site, beginning with the most populated sites within each region,” says Jerry Applegate, Cisco IT messaging migration program manager. “The e-mail migration was planned so that it could be carried out without disruption in multiple regions in parallel. Within each site, a number of users were selected each week and given the opportunity to schedule their migration within that week or to reschedule for a future time. The limiting factor was providing adequate support.”

A critical part of the overall strategy was the upgrade to Outlook 2003 *prior* to the Exchange migration itself. Outlook, bundled with Office 2003, was made available well in advance to allow users to become familiar with the new features before their accounts were migrated. Prior to the Office/Outlook deployment, around 10,000 clients were still using Eudora, with an average 5 GB of e-mail data each. After installing Office 2003, Eudora users could migrate their data to Outlook with a customized import tool. Because of the large volume of data and other issues related to the import, the deployment of Outlook took longer and generated higher case loads than expected. Once the users were accustomed to working with Outlook 2003, however, they were better able to assimilate the incremental changes from migrating to Exchange.

The client base was divided into two "waves:"

- Wave 1 consisted of regular employees
- Wave 2 consisted of all other employee types (pending entitlement resolution)

E-mail Migration Rate Management

The following table lists the approximate number of users initially planned for each e-mail migration wave, broken down by region. Regional managers in the United States, Canada, Americas International, Asia Pacific, and European and Emerging Markets were set up to handle the migration within their respective regions. This strategy helped ensure that deployments would be managed within each global region for improved communications and problem resolution.

US/Canada & Americas International	Wave 1	Wave 2	Total
United States	24,778	12,356	37,134
Non-US	1,001	816	1,817
Total	25,779	13,172	38,951

Asia Pacific	Wave 1	Wave 2	Total
Asia Pacific	1,972	1,480	3,452
India	662	4,311	4,973
Japan	824	447	1,272
Total	3,458	6,328	9,696

Migration Rates

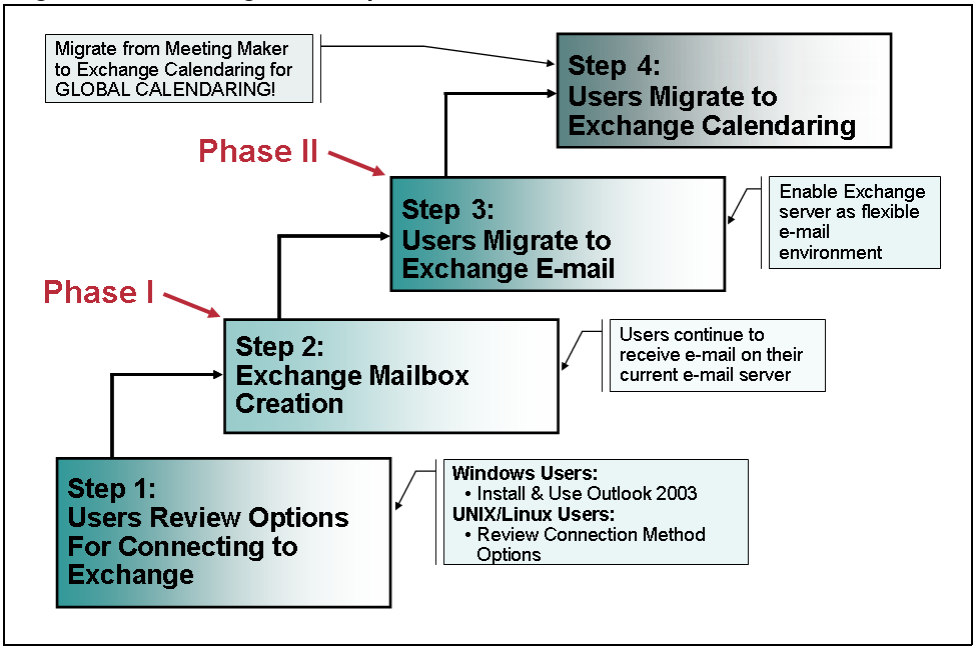
Of approximately 48,000 mail accounts, about 38,000 were eligible for migration and the rest were not. Target migration rates were developed based on the overall population, and they were adjusted along the way based on entitlements, as follows:

- If users were behind the firewall, by default they would get an Exchange account.
- If they were outside the firewall—that is, not permanent employees, such as manufacturing and development partners—by default they would get legacy e-mail accounts (Extra-net e-mail server).
- If they were inside the firewall and not a permanent employee, they were handled case-by-case.

Client Migration Wave Phases

Each wave was divided into two phases. The phases provided more time for Windows clients to upgrade to Outlook 2003 and import legacy mail if desired. Figure 4-2 illustrates the major steps for migrating clients to Exchange e-mail and calendaring.

Figure 4-2: Client Migration Steps

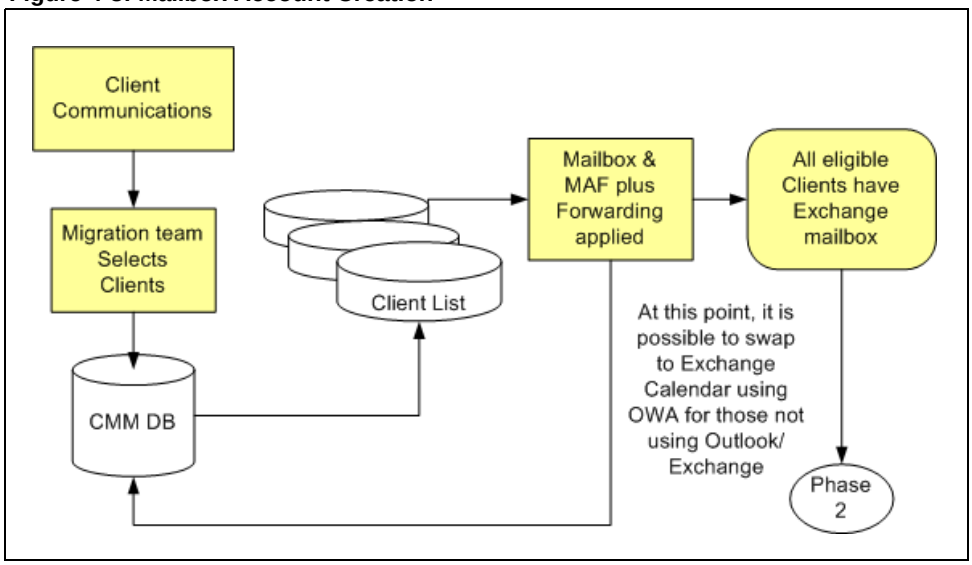


Phase 1: Mailbox Account Creation

Phase 1 involved creating mailboxes for all clients within their wave in order to routes messages to legacy mail servers transparently, requiring no client action. Clients could access their mailbox via Outlook Web Access (OWA). A background process prepared client Exchange accounts without disrupting their current e-mail delivery. Users were not required to connect to their Exchange account until notified to do so in Phase 2.

Figure 4-3 illustrates the mailbox account creation.

Figure 4-3: Mailbox Account Creation



Phase 2: Exchange Migration

Users were required to start background processes that configured their Exchange account (created in Phase 1) for use, and to set up their preferred e-mail application to connect to their Exchange mailbox. In the case of Windows clients, this entailed creating or changing their Outlook profile with the appropriate account information and selecting MAPI (Exchange native protocol) option. Clients could connect to Exchange via MAPI (Outlook), Evolution Exchange Connector, or other protocols, depending on the client base (for example, TAC (Sun) or Engineering (UNIX/Linux)). The e-mail application setup was automated for Outlook 2003 users; all other users were provided instructions to connect to Exchange.

Client-Facing Migration Website Functions

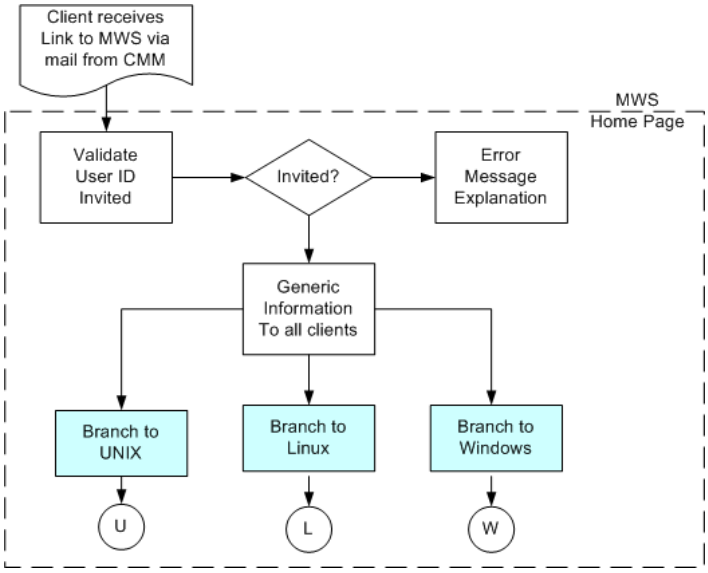
During Phase 2, employees were guided through the migration process using a client-facing migration Website that also allowed coordination of the "back-end events." The Website had the following characteristics:

- Was globally accessible as a common starting point for all clients/platforms (UNIX/Linux/Windows) with branches to platform-specific functions and information
- Provided basic information about the process, links to more details, and training opportunities (links open in new windows)
- Provided a mechanism for clients to request a delay and/or open a case for assistance
- For all clients, when “Proceed with my migration" was selected, a background script was initiated that turned off the Exchange forwarding and auto-purge set up in Phase 1
- The Website “communicated” with the CMM (Client Migration Management) database, setting flags to reflect the client’s migration progress

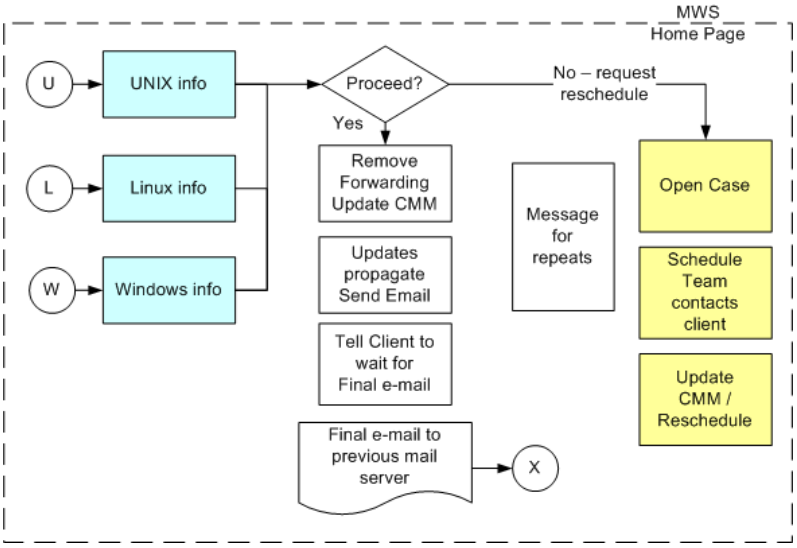
Phase 2: Client Migration Website (MWS) Process

The client Website migration process is as follows:

1. E-mail notices are sent to selected clients from the CMM system, as shown in the following flow. A final "day of" message provides a link to the migration Webpage.

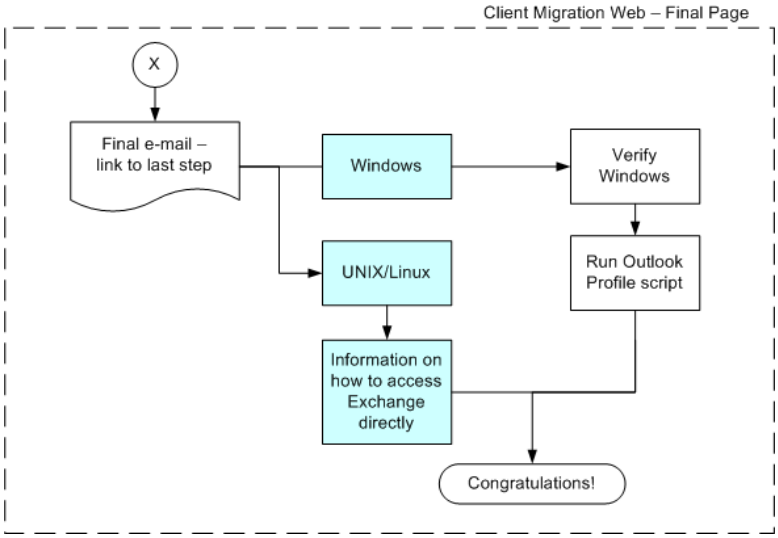


2. A client visits the Website, reviews the information, and either proceeds or requests rescheduling (opens a case), as shown in the following flow.



3. If the client proceeds, the final button initiates a script that removes the forwarding from the client's Exchange mailbox.

4. At this point, the client is thanked and told to expect a confirmation e-mail within the next xx hours. CMM is updated.
5. The clients receive at their old server the final e-mail with the location of the "final page," as shown in the following flow.



6. Linux/UNIX clients receive information to configure various mail clients for direct access to Exchange.
7. For Windows clients only, an Outlook profile is automatically configured for Exchange access.

Baseline Schedule

The baseline schedule was developed with exceptions for selected groups:

- The migration started with San Jose when the first pod production was ready.
- The migration proceeded from larger to smaller sites, and then from region to region (for example, from the United States and Canada to South America), or it went by common attributes such as small-site or off-site location.
- A few sites were scheduled based on the need to retire current mail servers.
- Other sites were scheduled based on their expressed desire to participate early.
- There were special one-off cases that required focused attention such as migrating the Office of the President and the Technical Assistance Center (TAC) whose primary communication with customers is by e-mail. The training and support teams were on hand to provide special training and support.
- Holidays and "catch-up" gaps were factored in to allow adjustments and backlog. This also accommodated focus for specially selected clients.
- About 500 users were connected to rogue Exchange servers. Focused attention on special cases was given to these rogue setups to do their own migration using the official tools and processes.

Outsourced Messaging System Operational Support

The messaging system operational support was outsourced to an independent technical support vendor during the migration. Cisco handled the entire user interface and coordinated with the support vendor to manage the Exchange infrastructure. The support vendor was responsible for keeping the Exchange infrastructure running smoothly in a heterogeneous environment until the migration was completed. For details, see "Operational Support" on page D-2.

Client Migration and Implementation Schedule

"The migration schedule outlined a sequence of events carefully planned to minimize disruption and support issues," says Jerry Applegate, Cisco IT messaging migration program manager. "It also allowed users to be exposed to the new system in stages. The upgrade to Microsoft Office 2003 was planned well before the mail migration, so users could become familiar with the tool. A pilot was also planned before the migration to test the automation strategy and support channel."

The client e-mail and calendar migration schedule was as follows:

1. Upgrade clients to Office 2003 and distribute Outlook using the Altiris software distribution tool prior to the Exchange server deployment.
2. For Linux users only, upgrade Evolution as part of Cisco Linux 4.31-3.
3. Run pilot several weeks before mail migration.
4. Perform e-mail account migration first:
   - Overlap deployment in both regions
   - US/Canada and Americas International target start first
   - Asia Pacific target start one month later
5. Evolution was provided to Linux clients as part of an upgrade of Cisco Linux, which is Enterprise Red Hat Linux with additional components and modifications. Users wanting to use Evolution for e-mail/calendar were required to upgrade to Cisco Linux 4.31-3 or higher. This was not an automated process.
6. Export e-mail items and contact data to Outlook using Transend utility.
7. Migrate executive staff and "select users" after global migration is completed.
8. Schedule calendar flash cut after most client migrations are completed.

Tools Required for Facilitating the Migration

The following tools were either developed or customized by the Tools/Automation team to automate client migration:

- Altiris workstation management and software distribution tool
- Transend client utility for importing e-mail data
- Mailbox provisioning script for configuring Exchange mailboxes
- Client Migration Management (CMM) database containing user, server, and status information
- Automated notification process for managing e-mail notifications
- Automated process to import conference room data

Altiris/Microsoft Office 2003 Distribution and Installation with ACNS

Altiris is a workstation management and software distribution tool that was used to distribute Outlook as part of the Microsoft Office 2003 upgrade. This tool was already available in Cisco, but the Office 2003 package was the largest software installation performed with Altiris. The Office package was customized to some extent using Microsoft's Custom Installation Wizard. In addition, Altiris leveraged the ACNS (Application and Content Networking Services) Cisco product to stage the Office package at various distribution sites through the Cisco network.

Transend E-mail Data Import Tool

Transend was a third-party optional client utility that was used to facilitate the import of legacy messages and contact data to Outlook. The desktop team developed a “wrapper” to facilitate ease of use and to overcome some of the limitations of the default setup.

Exchange Mailbox Provisioning Tool

A background process was developed for configuring Exchange mailboxes in advance of the migrations. Its purpose was to create an Exchange mailbox in the correct region based on the user’s primary work location. Creating the mailboxes with an automated tool allowed the migration team to monitor the success of the process and remove a potential source of errors, once the users initiated their portion of the migration.

Client Migration Management (CMM)

“To meet the aggressive schedule at Cisco, it was essential to provide detailed status tracking on a global level,” says Russ Bancroft, Cisco IT messaging migration project manager for the Americas International region. “The Client Migration Management (CMM) is a Web-based application that consists of a Web interface and a back-end database. The CMM database was developed to record several key user attributes such as user ID, legacy mail server, demographics, and each user’s migration status at any given point in time. The database was also used to track the decommissioning of the legacy mail servers since the Migration team could use it to verify that all user accounts had been migrated before a given server was retired.”

Automated Notification Process

CMM was programmed to use scheduling groups to process special groups of people, based on specific criteria. The baseline schedule was keyed off the location. This allowed customization of e-mail and timing of events. Given a target date, CMM would schedule notices automatically. The client migration coordinators were the primary users of CMM scheduling capabilities.

Conference Room Mailbox Creation Tool

Prior to the calendar cutover, an automated process was developed to import conference room data from the facilities (WPR) database into Active Directory. This process allowed for the automated creation, deletion, and updates to conference room mailboxes in Exchange whenever facilities (WPR) made changes on their systems. This is the same process/tool that was used in the earlier European and Emerging Markets migration for conference room updates.

Basic Client Migration Process

The client migration process involved the following major steps (for details, see "Expected Client Actions to Prepare for E-mail Migration" on page C-2):

1. Upgrade to Office 2003 (Windows) and Evolution 1.4.5 (Linux)
2. Creation of Exchange mailboxes
3. Integration of business process e-mail accounts
4. Training for "select users" (executive staff and administrators, power users)
5. Invitation to migrate sent from CMM to users
6. If rescheduling was needed, user contacted a client migration coordinator
7. Client Exchange mailbox was enabled and master routing tables was updated
8. E-mail client was configured by the user
9. Problem resolution and information resources were provided
10. Training for regular users was provided

Upgrade of Microsoft Windows Users to Office 2003

Initially the client software that needed to be updated to a common baseline Outlook 2003 was distributed to Windows users as part of the Office 2003 upgrade. During this upgrade, the support team was available for questions and coordination efforts. Since the files were backward compatible, no major problems were anticipated. The upgrade was performed using the Altiris software distribution utility. The process was similar to that used for other updates and on new machines. The users were asked to import old mail items after upgrading to Microsoft Office and before migrating to Exchange.

Update of Linux Users to Novell Evolution 1.4.5

For Linux users, Evolution 1.4.5 was upgraded in Cisco Linux 4.31-3 as an e-mail/calendar option. Cisco Linux includes Enterprise Red Hat, with some modifications and additional components. Evolution 1.4.5 was bundled in Cisco Linux 4.31-3. The upgrade to Cisco Linux 4.31-3 was performed automatically on all Linux users. The users had the option to import old mail items after upgrading to Evolution and before migrating to Exchange. Linux users could also use Outlook Web Access (OWA) for e-mail and calendaring.

OWA Deployed for European and Emerging Markets

Users on all platforms could connect to their messaging services via Outlook Web Access (OWA) using http://<domain name>. OWA was implemented for the European and Emerging Markets migration long before the Global E-mail and Calendar Program started. It was developed primarily for users who could only access e-mail and calendaring over an Internet browser. No client installation was needed. It also provided a safety net if a user did not have a workstation.

Creation of Exchange Mailboxes

Exchange mailboxes were automatically created and provisioned based on the clients' geographical location and a master schedule. The Exchange mailboxes remained disabled and only forwarded messages to the client's legacy mail server. The Exchange mailboxes remained in this state until a subsequent step that was initiated by the user.

Consolidation of Mail-Dependent Applications

Accounts for a few mail-dependent applications such as Remedy were created in Exchange. The Remedy case-tracking process had been tied to an Exchange 5.5

Server. Most accounts of this type that were supported in HP and Mirapoint servers were consolidated in a single non-Exchange server.

Invitations to Migrate

Based on the master schedule defined in the migration database, users would start receiving a series of mail messages from CMM that provided more information on the migration process and links to training, and other resources. Within each site, on average the weekly target was to migrate 2300 users. They would receive an e-mail informing them that they had been selected to migrate that week and asking them to either select the day of the week for their migration or to contact the client migration coordinator to reschedule for a later week. A large proportion of users chose to migrate on the indicated week. To initiate the migration, the user was asked to visit a Website and trigger the migration process.

Rescheduling Process

A Client Migration Coordinators team was assembled to deal with exceptions and questions. The coordinators interacted with CMM to determine if someone was on vacation or otherwise unavailable. CMM asked the users to specify when they wanted to migrate. This provided great flexibility. Between 75 and 80 percent of users migrated when they were invited.

Support Issues

When the migration response rate exceeded expectations, it created a support scalability challenge because the migration support team was not prepared to handle this high level of compliance. One of the reasons for the high compliance was an effective communications strategy. If the user did not respond to the first invitation, the next e-mail sent was copied to the manager. If there was no response the third time, the user was migrated automatically.

Enable Client Mailbox and Configure E-mail Client

After the user had triggered the migration process, the migration application would run background scripts to enable the client Exchange mailbox and update the master routing tables, causing e-mail to flow to the system. The new mailbox and routing updates were performed overnight. The migration consisted of an update to the user's "profile" that connected the user to their mailbox and took only minutes to complete. After the client mailbox was enabled, the user received notification that their new account was ready to access and that they could now run an automated script to configure their e-mail client.

E-mail Migration Pilot

Before starting such a large-scale migration, the team decided to conduct an e-mail pilot using randomly selected participants in Asia Pacific and Americas International, as well as volunteers. The goal of the e-mail migration pilot was to help ensure that there was adequate support for the e-mail migration by determining the optimum number of users who could be migrated with the support resources allocated.

The e-mail migration pilot was conducted over a two-month period. A larger than expected number of user queries led the team to generate a list of FAQs and to enhance their communications plan. The pilot also convinced the team that they could successfully scale 1000 users a week with their current support resources. The pilot population, however, was not large enough to give an accurate estimation of the actual migration support rate, and the support team struggled with the volume of calls during the migration. For more details, see "E-mail Migration Pilot" on page C-3.

E-mail Migration Readiness Checklist

Before deployment could begin in each region, the Global E-mail and Calendar Program team assessed project readiness. It was assumed that Exchange was ready for deployment if the items in Figure 4-4 were in place.

Figure 4-4: Readiness Checklist

Assume Completion on or before 3-Dec
Preparatory/Dependencies
General Readiness - before Phase 1 & 2
Presentation of Project plan to management
New hire process in place
Office 2003/Outlook 2003 in place prior to Phase 2
UNIX/Linux plan approved
Client ready (legacy mail?)
Readiness Review / Approval to Start
PODs
HK Pods Production Ready
Bangalore Pods Production Ready (before 12-Dec)
Americas Pods Production Ready (SJxx is first)
Tools
Migration/invitation/profile tools ready
Legacy data migration tools ready (client only)
Pilot Client feedback tool/process ready
Support & Scheduling Teams
Host/server support in place
Help Desk support and escalation plans in place
Scheduling Coordinators in place
GSD/Onsite support staff trained on Cisco specifics
Training
General Outlook WBT in place
Calandar WBT available (not needed until Phase 2)
Power User Training available
Entitlement/Access Policy check with progran
Non Cisco employees - Ruling for Wave 1
Special Users/Execs Identified and custom-scheduled
Technical Assistance Center - ruling - guidelines and ID
Global Communications
Global Comms issued
Asia Pacific Region Comms issued
Americas Region Comms issued

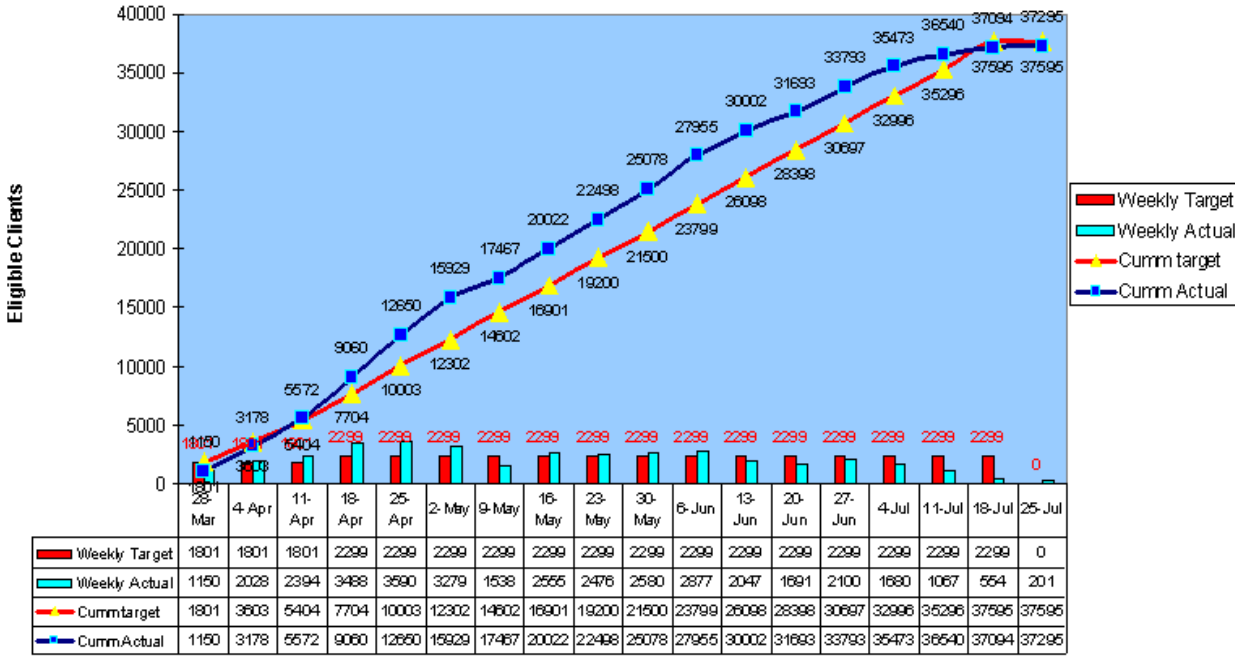
E-mail Migration Rates

The migration rates needed to stay within projected case rates (300 cases/day maximum). The rate could be adjusted if needed.

- The goal completion date was end of July 2005, subject to client satisfaction and support issues.
- The "catch up" and RC (Special Handling) intervals allowed time for reducing the backlog and adjusting schedules.
- Close coordination was maintained with the Learning group and the support staff of "select users."
- During the US/Canada and Americas International migration, the rates were tracked and exceeded, while the Asia Pacific migration proceeded on schedule.
- The project was completed by the beginning of July, roughly 30 days ahead of schedule. There was some cleanup after the end.

Figure 4-5 shows the weekly target and actual migration rates in US/Canada, Americas International, and Asia Pacific from start to end. The target was essentially reached by the second week of July.

Figure 4-5: Global E-mail and Calendar—Weekly Actual Tracking



	28-Mar	4-Apr	11-Apr	18-Apr	25-Apr	2-May	9-May	16-May	23-May	30-May	6-Jun	13-Jun	20-Jun	27-Jun	4-Jul	11-Jul	18-Jul	25-Jul
Weekly Target	1801	1801	1801	2299	2299	2299	2299	2299	2299	2299	2299	2299	2299	2299	2299	2299	2299	0
Weekly Actual	1150	2028	2394	3488	3590	3279	1538	2555	2476	2580	2877	2047	1691	2100	1680	1067	554	201
Cummtarget	1801	3603	5404	7704	10003	12302	14602	16901	19200	21500	23799	26098	28398	30697	32996	35296	37595	37595
CummActual	1150	3178	5572	9060	12650	15929	17467	20022	22498	25078	27955	30002	31693	33793	35473	36540	37094	37295

"Automating the entire migration workflow yielded a surprising speed of execution," says Teh Cheng, Global E-mail and Calendar Program manager.

E-mail Migration Lessons

This section discusses lessons learned by the migration program and project managers, the UNIX/Linux track, and the tools automation track.

Think Locally

To accomplish a global rollout, some degree of international and regional differences must be accommodated. Conducting onsite sessions in Asia Pacific, for instance, was critical to raising awareness and addressing concerns proactively. Visits by the team members also demonstrate a level of commitment from management, providing an unspoken endorsement. The same principle applies to staffing. Having region-based project managers with detailed knowledge of the cultural aspects as well as other local activities/priorities was of tremendous advantage.

Special Case Handling

There were two important considerations behind successfully meeting the aggressive migration schedule. One aspect was setting up a simple strategy with a scalable process for handling the "normal" cases. The other involved separating out "special" cases. By identifying clients who otherwise would have slowed down the mainstream progress, the team could address them in parallel with the masses and deal with their particular issues while still making the numbers. Once the special cases were culled, tiger teams were formed to handle them without affecting the baseline schedule. Regional project managers, under the leadership of the Messaging program manager, focused on the process for the masses.

“One example of how the migration team successfully managed special cases involved the 900 client mailboxes on the Sydney Microsoft Exchange 5.5 server,” says Peter Colless, messaging migration project manager for Asia Pacific. This relatively small and manageable group was already working out of the mailbox on the server. The Asia Pacific migration team decided to make this group's transition to their new mailboxes as seamless as possible by modifying the main Exchange 2003 migration process so that all the Exchange 5.5 client data could be copied to their new mailboxes as part of the migration.”

Setting an Example at the Executive Level

Despite the risk, if it is expected that the client base may offer some resistance, getting the senior executives on board early can be strategic. For the e-mail migrations, the team migrated the Office of the President before tackling the primary schedule and well before approaching the next rung down in the management ladder. This allowed the team members to refer to some very influential users when they encountered reluctance later on.

Partnering

The E-mail Migration team made an excellent and effective effort to partner with other key groups—from the Technical Assistance Center (TAC) to "special cases" support teams, to resistant engineering groups. Engaging them early, training them and leveraging their skills was crucial. Isolated cases such as rogue Exchange and Sendmail servers, and Exchange 5.5 users were handled by specialty teams with expertise in these areas.

Successful UNIX/Linux Outreach

A flexible, hybrid solution was exactly what was needed for e-mail. An Evolution client option was identified for Linux users. An early program outreach resulted in noncontentious e-mail migration. The Program built some credibility for frankness and willingness to acknowledge UNIX group existence. A quota tool was built to address the feature gap. The UNIX/Linux community requires constant and sustained specific outreach from the IT side.

UNIX/Linux Users Calendar Acceptance

There was a failure to match the level of e-mail success with calendaring. E-mail acceptance was not equivalent to calendar acceptance. The Program lost much of the credibility earned in the e-mail phase. The UNIX/Linux community needed more sustained focus. There was not enough communications focus on Microsoft OWA and Novell Evolution. The team was unable to build a server-side rules tool to bridge the gap. Also, the team should have migrated scribe/cypher/holdouts earlier.

Good Tools Requirements

Better requirements gathering should have been done prior to tool development—for example, the Tools requirements did not include operational usage. The infrastructure should not be underestimated—more system analysis was required than anticipated. Requirements should help ensure that tools are usable by Support and Operations teams, not just developers. The processes still required a lot of manual intervention.

Solution: Exchange Calendar Cutover

This section discusses the calendar cutover plan and the calendar cutover phases.

Calendar Cutover Plan

Although the e-mail migration took months, the Exchange calendar cutover was performed over a single weekend. This was a requirement, because there was no way to share the process of scheduling reservable resources, such as meeting rooms, across two calendar platforms. Although the actual cutover took only one weekend, a good deal of preparation was required.

The Calendar Cutover track team performed the following tasks to prepare for the cutover:

- Validated facilities (WPR) conference room data and related import process
- Developed training plan for regular users and power users or “special users”
- Allowed key users early access (two to three weeks ahead of the cutover) for conference room reservation under special circumstances
- Developed a robust support plan for the one-day cutover
- Developed a strong communications plan to communicate to users the cutover date and what they needed to do
- Determined, after adequate research, not to convert calendar data to Exchange and opted for a “cold-cutover” from Meeting Maker to Exchange (see “Decision not to Convert Calendar Data to Exchange” on page C-5)

Validate WPR (Facilities) Conference Room Data

This document refers to two sets of data, as follows:

- List of conference rooms—the actual list of conference rooms to be migrated from Meeting Maker to Exchange had to be imported into Exchange.
- Data in conference rooms and in end-user calendars—this data consisted of the actual meetings or bookings and was not migrated to Exchange.

Conference rooms could not be fed directly from Meeting Maker but had to be fed from WPR. Data from WPR had to be cleaned, and the status of conference rooms had to be updated to reflect Online, Offline, or Private. Only ten percent of the conference rooms remained offline when the cutover took place. This helped to ensure that more conference rooms would be available for users to reserve automatically and was a direct result of the clean-up process between the WPR systems and the data stored in Meeting Maker.

The conference room fixed accessories, such as built-in projectors and microphones, were added as room attributes so they would be visible to the user, but the accessories could not be managed. Portable accessories such as projectors were not tracked into the WPR system and, therefore, could not be imported into Exchange.

The following three types of rooms were imported:

- Online—all online rooms can be automatically booked.
- Offline—these rooms are owned by a specific team; for example, the training organization. Booking requests to these rooms have to be accepted by a proxy administrator for the room. These rooms are visible to everyone.
- Private—these VIP rooms are managed by one or more proxy owners, but are hidden from view to help ensure privacy.

Cutover Support

"Due to the 'cold-cutover' approach used, it was essential that the team be ready to support the end-user base on Day 1," says Adel Du Toit, Cisco IT calendar cutover project manager. "The support plan included direct line communications from the support room between the project team and the Help Desk (GTRC) from Day 1 of the cutover. Calendar support calls could be monitored by everyone in the support room, thus avoiding any need for escalation. In addition, the Calendar Conflict Resolution Tool (CCRT) was developed to help resolve room booking conflicts."

Once a user entered a calendar conflict case, the Help Desk would route it to the support room, where someone could access CCRT to query the Meeting Maker database for information. This information would allow support room and Help Desk personnel to quickly and smoothly negotiate an amicable resolution of the conflict between the affected parties. For more details, see "Day 2 Calendar Cutover Support Metrics" on page D-12.

Communications Plan

An Exchange Calendar Website was developed, posters were placed in strategic locations, and a series of calendar invites were sent at the start of each phase. Once the event was scheduled in the calendar, users would get reminders that were precisely synchronized to appear in between the invites. For details on the invites, see "Calendar Invitations" on page C-6.

Calendaring Migration Strategy

Approximately 40,000 users needed to be migrated from Meeting Maker to Exchange calendar. Calendar propagation across multiple zones needed to be supported. The strategy for migrating the calendar system was to wait until all sites had migrated their e-mail systems and could access Exchange. Conference rooms could not be added as sites migrated because meeting rooms were not distributed across Meeting maker on a site-by-site basis. One source of truth had to remain in place for conference room bookings. This strategy gave users the opportunity to feel comfortable with Outlook 2003 and Exchange and helped ensure that the system was running smoothly before they migrated their calendar. The calendar cutover of meeting rooms had to take place in a 30-hour window (over a weekend) to prevent disruption to the system.

Calendar Pilot

"Before migrating the conference rooms to Exchange calendar, the e-mail migration to Exchange 2003 had to be complete," says Adel Du Toit, calendar cutover project manager. "Large-scale pilots could not be conducted with 'live' conference rooms, as Meeting Maker had to remain the system of record for conference room bookings until the cutover took place. The calendar pilot primarily consisted of provisioning and then testing."

The majority of testing was conducted on a staging environment; all conference rooms were injected to help ensure accuracy. This complete provisioning on the stage environment was conducted five times. In addition, a limited number of "dummy" conference rooms were also imported into the production environment to help ensure end-to-end testing.

Calendar Cutover Steps

For more details on these steps, see "Calendar Cutover Details" on page C-5.

Step 1. Cutover Preparation

The cutover preparation step consisted of the following tasks (for details, see "Step 1: Calendar Cutover Preparation" on page C-5):

- Enabling conference room import process
- Creating and configuring mailboxes for the conference rooms
- Allowing power users early access to data
- Broadcasting IPTV calendar precutover training

Step 2. Calendar Cutover: Weekend Support Room Tasks

The cutover weekend was managed from a dedicated support room, as follows (for details, see "Step 2: Calendar Cutover Weekend" on page C-7):

- Turning Meeting Maker servers off and placing data files on share
- Provisioning all rooms, testing, and making Go/No Go decision
- Updating phone message to invite users to IPTV session and to inform them that the conference rooms were now available

Step 3. Calendar Postcutover: Day 1 and Beyond

The postcutover tasks were as follows (for details, see "Step 3: Day 1 and Beyond" on page C-10):

- E-mail with "now available" message and CIO voicemail sent on Day 1
- Three locations (Sydney, Australia; Austin, Texas; and San Jose, California) provided business hours support for three days following the cutover.
- Users were encouraged to migrate calendar data and recreate conference room bookings.

Calendar Cutover Lessons

This section discusses lessons learned during the Calendar cutover.

Three-Step Approach

The Calendar track team developed a three-step approach to prepare end users for the cutover, and this worked extremely well. During the cutover step, users were allowed to recreate and start using their calendars and booking roomless meetings—that is, they could book meetings with other people, but still needed to reserve meeting rooms with older calendaring software. Several weeks later, in the final step, users could begin booking conference rooms immediately after the cutover because they were already acquainted with the new calendaring services. The team learned, however, that they should have found the right people at the start to engage with facilities (WPR).

Calendar Invitations

To begin adoption of Exchange calendaring, the Calendar Cutover track team sent calendar invitations to users as an all-day event (banner). This helped to ensure that each user who had not already received a calendar invitation, received at least two invitations prior to cutover. Three invitations were sent corresponding to each of the three steps. For maximum effectiveness, each invitation had a reminder that was precisely coordinated for delivery along with the other invitations.

Assumptions Based on Prior Experience

The assumption was made that the calendar migration would be easy because the European and Emerging Markets had already migrated successfully to Outlook calendar. It should not be assumed that the successful deployment of calendar in one region, European and Emerging Markets, implies the same calm outcome in other regions, such as the United States, Canada, and Asia Pacific. With 20/20 hindsight, a calendar pilot in June could have given the team more time to develop FAQs and identify problems. The team also underestimated user anxiety over the cold-cut approach. Euphoria in a prior project phase should not be allowed to skew the focus on client details for latter phases.

MODULE 5

Training and Support: Helping Users Leap to a New Messaging System

Content

Overview

The Global E-mail and Calendar Program team designed a training and support solution that would allow them to manage the users' experience with their e-mail and calendaring changes.

This case study describes how Cisco approached training and support on a large-scale migration from a Sendmail environment to an Exchange environment. Cisco chose to invest heavily in both training and support due to the personal nature of e-mail and the dramatic shift with calendaring. As many support issues often come as a result of poor user training, Cisco IT put special emphasis on early, consistent, and well-timed training to reduce overall support costs.

Training and Support Objectives

The Training and Support track objectives were closely linked with each other. Issues identified through support would affect the content and frequency of instruction, while adequate and timely training would reduce the need for support.

The Global E-mail and Calendar Program team designed Support and Training tracks with the following objectives.

- Provide flexible options for a global mobile workforce
- Invest in the most effective medium for training and support
- Provide support that is accessible 24 hours a day
- Scale training and support for 50,000 users
- Provide early training for the Help Desk support and critical power users
- Use a core versus context approach to back-end operations and help desk support
- Develop a support model flow that defines a clear problem resolution path through all levels and types of support

E-mail Migration and Calendar Training

This section describes the training track team and training challenges, solutions, and lessons learned.

Training Track Team

This section describes how the Training Track team fulfilled their goals.

Training Goals

The Training Track team had three major responsibilities:

- Developing the global strategy and courses for training the population of general users and power users on the new Exchange e-mail and calendaring services.
- Collaborating closely with the other teams to help ensure that users understood how to use the new features and applications and to minimize any effect on their productivity.
- Coordinating communications delivered to the learners and monitoring support statistics to help ensure that adequate training was available and users knew how to obtain it.

Major Training Functions

The Training Track team accomplished their goals by pursuing the following tasks:

- Developed the training strategy and schedule planning
- Designed the instructional material
- Generated reports on a weekly basis to track enrollment, participant feedback, and other metrics
- Developed a tool to automatically send invitations to users two weeks after they had migrated their e-mail
- Outsourced course content development, instructor-led training (ILT), Virtual Classroom (VC) training, and translation of course content and Quick Reference Guides into multiple languages

Training Challenges

The Global E-mail and Calendar Program was a large-scale project. The Training department had never faced a rollout of this magnitude. Some of the challenges were as follows:

- Determining how much to invest in training
- Determining how to increase the usually low adoption rate of user training
- Training users on a new system in a very short period of time
- Training different types of groups: special users, power users, as well as regular users
- Developing adequate training for e-mail and calendaring applications, which are critical to each employee
- Providing the wide variety of training required by the global mobile workforce at Cisco
- Providing multiple language translations

Training Solution

This section discusses the different types of training available, the audience, training materials and languages, training notifications, metrics, as well as other sources of information.

Training Audience

The different categories of learners are described in the following table:

Audience Type	Characteristics
General Population	• Everyday users
Power Users	• People who use Outlook as a critical/major portion of their job function • Executives • Executive administrators • Administrative assistants • Others with similar job roles

Training Deliverables for the General Population

The training deliverables are described in the following table:

Class Type	Characteristics
Web-based Training	• Provided at no cost • Cisco-developed Web-based training specifically for the Exchange rollout • Microsoft training library (MELL) will be made available in English and Japanese • Web-based training consists of several topic broken down into modules that the students complete at their own pace
Virtual Classes	• Broadcasted by a live instructor over the Web • Cost associated with these classes was $120 for three one-hour sessions • Offered globally in all time zones. Learners could register for the most suitable session.

Training Deliverables for Power Users

Power users required individual attention and courses specifically tailored to their job functions. They also needed mandatory training scheduled well in advance of the migration or cutover.

Class Type	Characteristics
Instructor-led	• Classes led by an instructor in a classroom setting • Three hours in length • Limited to power users by invitation-only **Note**: Because the cost of instructor-led training is fairly high and often has low participation, these classes were provided only to power users.
Fast Learning (Virtual Classroom)	• Length was 60 to 90 minutes • Focus on special topics in conjunction with support issues. • The objective was to improve productivity by providing tips and encouraging users to utilize new features. • Allowed the Training team to deal with specific complaints or requests for special training from specific groups. • During the calendar cutover, the following courses were taught: — Outlook Mailbox Management — Calendar Permission Settings and Delegation — Top five Issues for Help Desk

Outlook E-mail and Calendar Trainer Program

In order to accomplish such a large-scale training project, the largest that Cisco had ever undertaken, training was outsourced through certified vendors worldwide. A program was established to train the trainers in-house and Trainer Guides were developed. It is estimated that over 20,000 training sessions were delivered.

Training Notifications

Available training was advertised in various ways:

- Notifications were included in the migration e-mails
- ITLG courses were announced through e-mails
- Training signup instructions were posted in the Outlook Exchange Learning Information Webpage

Training Materials

Training materials for Instructor-Led Training (ILT), Virtual Classroom, and Web-based courses for both e-mail and calendaring were designed by an in-house Instructional Designer and developed by an outside vendor.

Content	Course Type	Materials
E-mail and Contact	Instructor-led Training Virtual Classroom Web-based	Student Guide Trainer Guide Quick Reference Guide
Calendar	Instructor-led Training Virtual Classroom Web-based	Student Guide Trainer Guide Quick Reference Guide
Outlook Web Access (OWA)	None	Quick Reference Guide

Training Languages

“The determining factors for offering training in a local language are class size and Outlook user interface language,” says Paul Samuel Nosa, Cisco IT Training Track project manager. “In Japan, training was conducted in Japanese by local trainers using Japanese versions of the Student Guide and a Japanese user interface. In China and Korea the trainers taught the courses in their native language but used English Student Guides since the user interface text was in English. This was the most cost-effective way of teaching these courses.”

Course content was only translated into Japanese. Quick Reference Guides were translated into the following languages:

- Simplified Chinese (Mandarin)
- Japanese
- South American Spanish
- Portuguese (Brazilian)
- Korean

Informational Q&A Sessions

Informational sessions were presented as needed. “For example, these sessions were given to administrative assistants and executive administrators to help them prepare for the migration,” says Paul Samuel Nosa, Cisco IT Training Track project manager. “After the migration, the sessions focused on specific topics. Q&A sessions (workshops) were also held, and included a technician who could answer specific questions and provide focused tips. These sessions were held globally, at random.”

Training Registration (Notification Automation)

The migration registration and training database were linked to allow for automated notifications. The tool automatically triggered an invitation to attend a class. This tool was customized to identify the user background (Outlook, Eudora, etc.). Client segmentation was also done so the tool would send invitations for ILT only to special users, such as administrative assistants.

Other Learning Resources

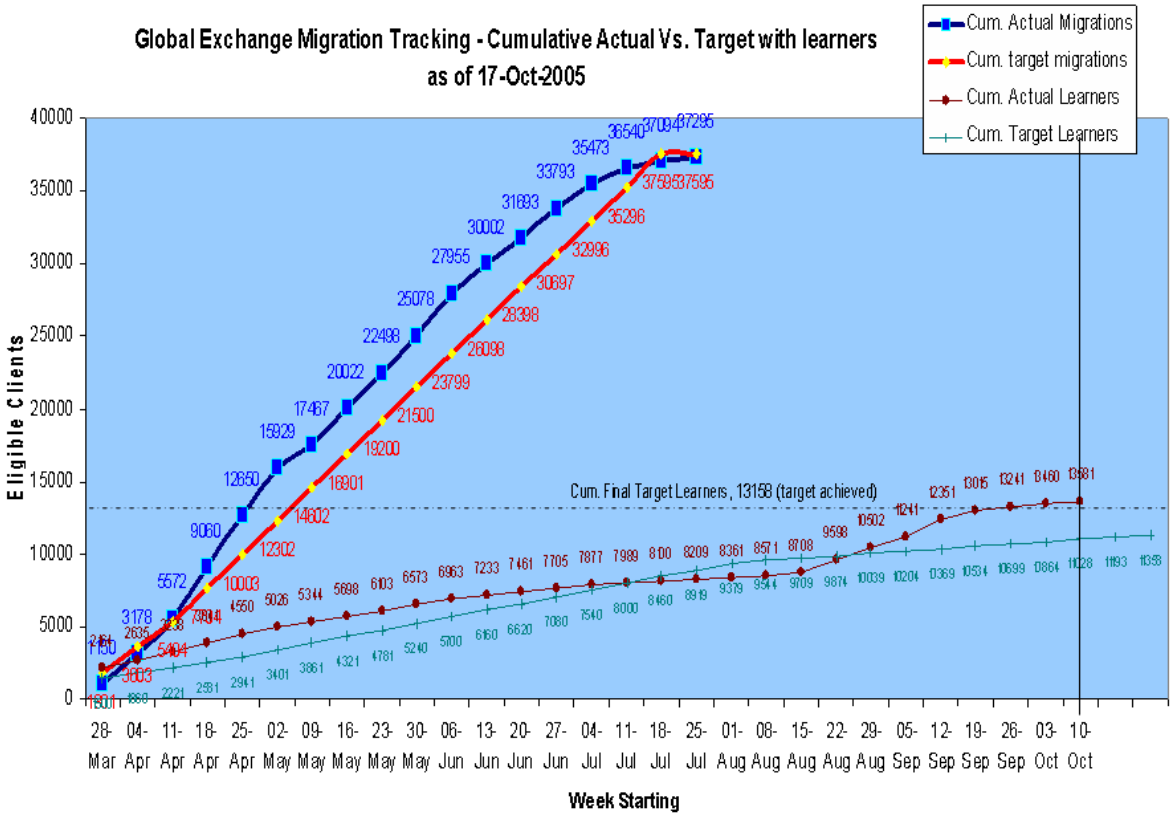
Additional information aids are provided in the IT Services and Support Website. This material is not a substitute for training, but is targeted at specific situations. The information includes the following items:

- Quick Reference Guides (QRG)—available in multiple languages: Outlook 2003 with Exchange, Outlook 2003 Calendar, and Outlook Web Access (OWA) Calendar.
- Best Practices—contain important information and instructions on how to mitigate potential problems for Outlook 2003 e-mail, calendar, and OWA.
- New Features—describes in detail the new Exchange features such as Cached Exchange Mode, Custom Search Folders, Junk E-mail Filter, Quick Flags, Auto-archive, and Rules and alerts.

Training Metrics

Training metrics were analyzed closely in tandem with migration rates. Figure 5-1 shows the target versus actual figures for learners several weeks after the September 19 calendar cutover date. By this time the number of users receiving training had exceeded the expected learners. The training levels reached their target on September 19, the day of the calendar cutover.

Figure 5-1: Cumulative Actual Versus Target Migrations with Learners



Customer Satisfaction Scores

Over 14 percent of class attendees provided feedback. Of these over 80 percent were satisfied or very satisfied. As of October 2005, the average Customer Satisfaction (CSAT) scores for the Exchange Migration courseware for all class types were as follows:

Duration	July 2004 to October 2005
Enrollment	13,540
Survey respondents	3,933
Average CSAT	4.01

Training Lessons Learned

This section describes the lessons learned during the e-mail and calendar migration.

Use Multiple Delivery Channels

Multiple delivery channels including Instructor-Led Training, Virtual Classroom, Web-based, and self-paced were used to reach as wide an audience as possible in a short time frame, and this worked very well.

Integrate Training with Program Schedule

As much as possible, training was integrated with the Global E-mail and Calendar Program schedule. Pre- and post-migration follow-up, case generation follow-up, and training were synchronized with the communications and migration schedule.

Deliver Specialized Training as Necessary

The Training team worked closely with the support groups of special users, such as executive administrators. The tight partnership was used to quickly deliver specialized training on the spot, as needed, over a period of two or three weeks. The Training Track team held one-hour workshops with these special users for specific questions and support issues. Special sessions, such as supplemental training on Mail Management and Calendaring were provided.

Improve Training Content Continuously

The sessions created for administrative assistants and executive administrators were around specific issues that had been identified by the support groups. Quick Tips based on those issues were later developed and distributed. Rollout training has different requirements than later training, because it starts from ground zero. After three or four months, the type of training required changed, and the training team launched Fast Learning sessions focused on specific topics for Mail Management and Calendaring.

Screen Carefully the Skills of Local Training Resources

The initial quality of instruction in Sydney and Singapore did not meet Cisco standards, but suitable instructors were quickly found for future training sessions. These were the only two instances of negative feedback. Local instructors should be screened carefully, not only for subject expertise, but also for their facilitation and people skills. Since Cisco-approved vendors provided the instructors, a template or criteria list would have been helpful to better qualify local training agency capabilities. On the other hand, local training was well received. Local training was adapted to the size of the audience and delivered in the local language.

Anticipate Supplemental Training Needs

The request for additional administrative training was not anticipated, but administrative needs were met with informational sessions and workshops. The Training team did not anticipate opportunistic training events or additional client interest and/or demand for training. In spite of some unforeseen emergencies, they had sufficient budget to take care of unexpected events.

Determine Whether Training is Needed on all Platforms

The training developed for this program was Microsoft Windows-dominant. A decision was made not to offer Outlook Web Access (OWA) or Evolution training, based on the number of Cisco users. A Quick Reference Guide was developed for OWA users. The topic was raised multiple times, and the same decision was always made by the Program team. Later, it was determined that this training was needed.

E-mail Migration and Calendar Support Model

This section describes the Support Model objectives, track team, priority levels and process.

Support Objectives

The Global E-mail and Calendar Program team developed a support model process to accomplish the following objectives:

- Provide client migration coordinators that would coordinate with users on their migration schedule, assist Help Desk personnel on migration issues, and record progress and status of migration
- Provide client-side support using the Help Desk—known internally as the Global Technical Response Center, or GTRC—for both the e-mail migration and the calendar cutover
- Provide operation support for the Exchange server, including Exchange and Windows support

Support Model Track Teams

The Support Track included multiple teams that focused on the process around the back-end support and developed the flow between the Help Desk and Level 3 client support.

The Support Track included the following teams:

- Client E-mail Migration Coordinators—managed the scheduling, end user interface, and reporting during the e-mail migration (see "Client E-mail Migration Coordinators" on page 5-9).
- Cisco Help Desk—outsourced to IBM—managed the e-mail migration.
- Operation support—Exchange Level 3—was outsourced as well to a specialized vendor, since this expertise was missing in-house. The team managed contracts and relationships with the Level 3 support vendor and provided an interface with the Vendor Management Office (VMO). Negotiations were completed in three and a half months.
- Windows Hosting support—provided by separate Data Center Systems and Solutions (DCSS) organizations at each of the three regions. This effort set in motion the development of the globalization process for DCSS.
- Active Directory/DNS support
- Storage support

Client E-mail Migration Coordinators

One of the major lessons learned from the European and Emerging Markets migration was that it took a lot of record keeping and interaction with users to negotiate and maintain schedules. The client migration coordinators would start with the baseline schedule for a given site, then deal with questions and rescheduling requests that would invariably come up. By having a team of people dedicated to this interaction with users, two things were accomplished: first, the team was able to adhere to the baseline schedule but still accommodate legitimate requests for special circumstances (such as leave of absence, PTO, or unavoidable conflicts). Secondly, the team was able to prevent scheduling questions and requests from reaching the Help Desk, allowing Help Desk (GTRC) personnel to focus on dealing with post-migration cases.

The client migration coordinators functions included handling case work, interacting with other track teams, and providing reports, as follows:

- Worked minor technical issues such as profile issues, and incomplete installation of Office 2003, thus preventing problems with simple fixes from reaching the Help Desk and increasing wait times
- Actively worked with the Help Desk on handling some of the support calls, for increased client support and satisfaction
- Created FAQs and support/response scripts for voice and e-mail inquiries
- Provided feedback to the Training track on topics that needed more visibility or inclusion in the courses themselves, based upon input from users' calls and e-mail
- Provided feedback to the Communications track on items that the users were not understanding or that needed elaboration.
- Acted as the primary point of contact for escalations, working on the issues and escalating them to the migration lead or to the regional migration project manager, as appropriate.
- Provided reports on all the key migration statistics, as follows:
  - The number migrated per week, reschedules per week, and forced migrations per week
  - A running total and percent migrated to date
  - The number migrated on a particular server type (for example, Mirapoint servers)
  - The number migrated per employee type or organization: Engineering, Technical Assistance Center (TAC), special cases, and power users

Priority Levels

The following table describes the levels of priority for the hardware:

Priority	Item
Highest Priority (P1)	Exchange Mailbox Servers
	More than one Bridgehead is down
	More than one Front-End server is down
	Exchange Free/Busy (Public Folder)
	Backup Servers
Moderate Priority (P3)	Exchange Bridgehead Servers
	Exchange Front-End Servers
Lower Priority (P4)	Hot Spare Servers

Priority Level Definitions

The following table describes the levels of priority for hardware problem or service request resolution:

Priority	Case Type	Definition	Potential Effect
P1	Problem	Loss of this service has the potential for **immediate** and **severe** business effect on Cisco.	• Revenue loss (actual not postponed) • Inability to make or ship product • Inability to develop code or product • Inability to meet contractual, legal, or government-imposed processing deadlines • Effect on external Cisco customers, partners, and/or supplier processes with negative implications to relations, market perception, and/or revenue • Engineering unable to work on a critical customer build or fix or CAP account issue
P2	Problem	Loss of this service has the potential for **adverse** business effect on Cisco.	• Inability of one or more organizations within Cisco to perform their daily operations, such that they are essentially idle • Direct and critical effect on executives within the company • Development, test, disaster recovery, or staging environment for a P1 service or system
P3	Problem Service request	Loss of this service has the potential for **low** business effect on Cisco.	• Inability of multiple users to perform their daily tasks such that they are essentially idle, or effect on a single user under an approved, documented SLA requirement • Development, test, disaster recovery, or staging environment for a P2 service or system

Service Level Agreements (SLA)

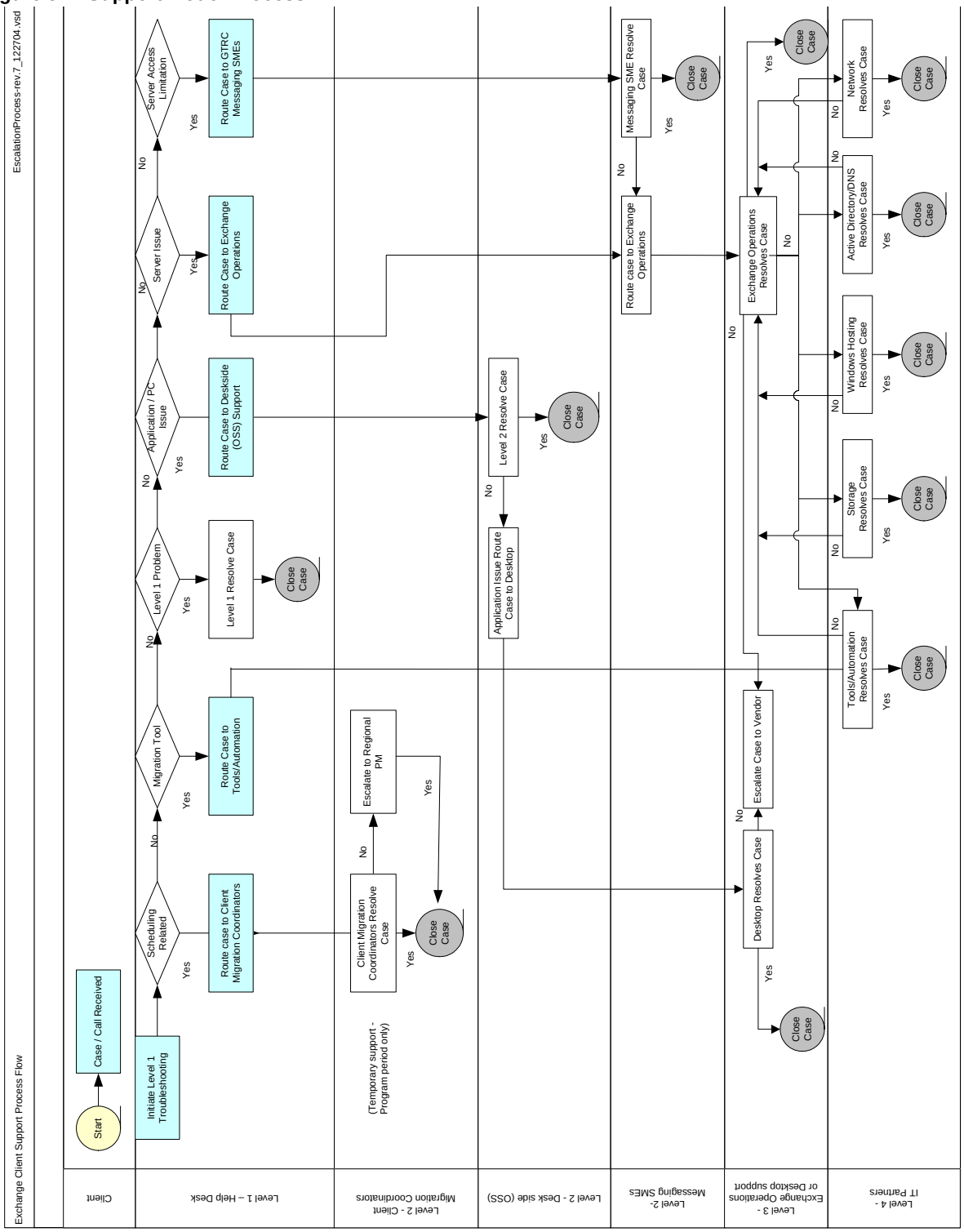
The following table describes the service level agreements (SLA) for each priority level.

Priority	Time to Respond	Time to Resolve
P1	Immediate response	2-hour resolution
P2	Immediate response	4-hour resolution
P3	Four-hour response	24-hour resolution
P4	Call to confirm	48-hour resolution

Support Model Process

Figure 5-2 illustrates the support process flow.

Figure 5-2: Support Model Process



Operation Support

Operation Support provides system and application administration support. This section discusses the Operation Support challenges, solution, and lessons learned.

Operation Support Challenges

Operation support had the following challenges:

- Not sufficient expertise in-house for Exchange hardware and Microsoft Windows required support to be outsourced to a third-party vendor.
- Global support had to be provided by two separate Data Center Systems and Solution (DCSS) groups in three regions. These groups were separate, and not unified, at the time.

Operation Support Solution

The Operation Support solution involved developing a process for hardware and OS support and outsourcing the application administration.

Hardware and OS Support

Process flows were developed by the EMS team to describe support functions between the EMS and the DCSS-WIS and DCSS-APJ teams. For detailed flows, see "Support Processes" on page D-4. The DCSS-WIS and DCSS-APJ teams used their existing processes for Hardware and OS support for Exchange and owned the documentation. The DCSS-WIS and DCSS-APJ teams provided the EMS team with the process flows that would be used for hardware and OS support during the global E-mail and Calendar migration. For location of server functions, see "Server Functions Distribution" on page D-2 and for software configuration, see "Software (Operating System) Configuration" on page D-2.

Outsourced Global Applications Support

The application support was outsourced to a third-party vendor with Exchange support experience, but the Enterprise Messaging Services (EMS) group retained ownership. The Support Model group provided liaison with the Vendor Management Office (VMO). The support agreement also included support for Exchange Unity. For details on application support processes, see "Application Support Escalation Processes" on page D-3.

The applications support parameters were defined as follows:

- Global support delivered 24 hours a day from SJC and RTP for redundancy
- Responsible for all Exchange application support:
  - Tickets to WW-SCH-Duty
  - Reactive support
  - Proactive support
  - Change management

Operation Support Lessons

This section discusses some of the lessons learned for providing operation support.

Create Single Location for all Messaging Issues

To help ensure specialist support for areas such as networking and storage, IT teams were created for this support, but because of their different areas of expertise, they did not work at the same location. This resulted in initial cross-functional team work issues. Co-locating the Tier 3 Exchange support (application support) desk with the Enterprise Messaging Services (EMS) team helped to ensure a consistent one-stop-shop for all messaging issues and allowed leveraging the cross-functional teamwork already in place between messaging and the other IT teams, such as storage and networking.

Provide High Level of Operational Support

To help ensure a high level of operational support, the Support Model for Exchange Operations developed procedures for the following:

- A central repository for support documentation
- Monitoring
- Hot spare solutions
- A 24 hours-per-day follow-the-sun support

E-mail Migration Support

This section discusses the e-mail migration support challenges, solution, and lessons learned.

E-mail Migration Support Challenges

The client migration challenges were as follows:

- Large deployment each week
- Concerns over the Help Desk ability to scale
- Scheduling concerns—too many reschedules or low scheduling would affect the deployment
- Shadow IT rogue mail rollouts

E-mail Migration Support Solution

This section describes the e-mail migration solution.

E-mail Migration Support Pilot

A pilot was conducted to validate the process and tools for the client migration. The pilot results helped identify issues and suggested enhancements. Support team members were involved in the Pilot, which made it possible for them to anticipate client issues.

E-mail Migration Support Rates

This section discusses weekly target migration rates in the US/Canada, Americas International, and Asia Pacific. The migration rates assume the following support rates:

- Call/case rate = 30 percent, average 2 cases per user.

- The wait time exceeded normal service levels and varied, but occasionally the call duration exceeded 20 minutes. Some of these calls were training calls.
- Peak calls = 5000 * 30% = 1,500/week = 300/day

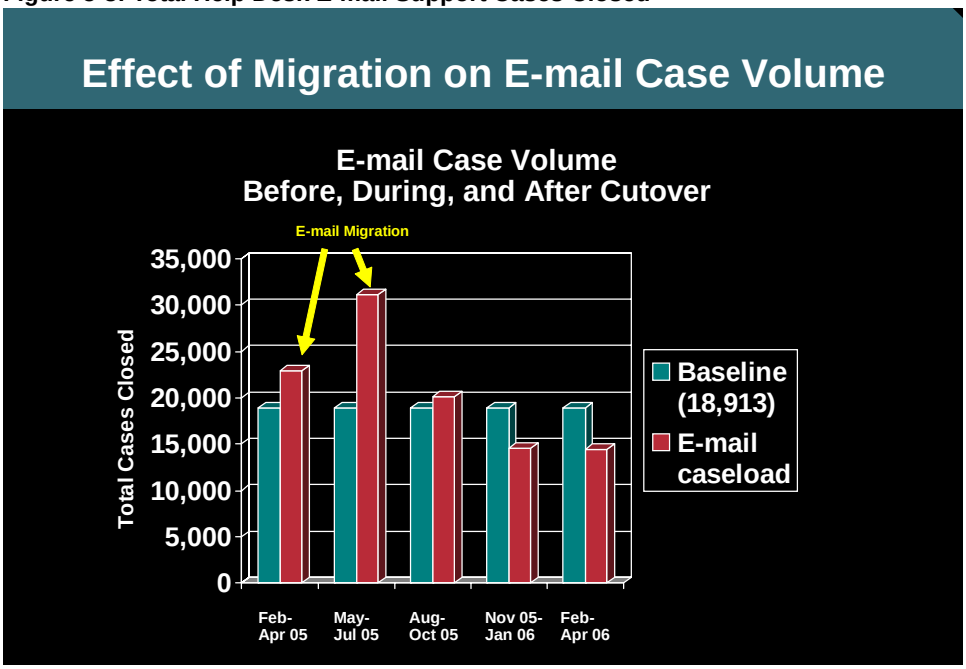
The high weekly adoption rate led to a faster deployment. First-Level support (Help Desk) handled over 85 percent of the e-mail migration support call volume with 1 percent being escalated to Level 3.

The additional staff given to the Help Desk proved insufficient during the peak times. The call handle time was between 18 and 20 minutes, as opposed to the estimated 10-minute handle time per case. The calls took longer because they were more complex; that is, users addressed multiple issues on every single phone call. Most users kept support people on the phone for the whole process. Coupled with the large call volume, this led to long support wait time. Customers would get very frustrated with the wait time and would press any extension to get a live agent. Additional phone redirection messages were added to redirect users to the IT Services Support Webpage.

Help Desk Total Cases for E-mail Migration

Figure 5-3 shows the total Outlook e-mail cases closed by the Help Desk (GTRC) before, during, and after the global e-mail migration period, May to July 2005. The case rate in the last quarter shown was approximately 37 percent less than in the quarter before the migration and 24 percent less than the case load baseline. The case load during the migration was 39 percent higher than the baseline. Over the period shown, the average customer satisfaction (CSAT) score was a very high 4.7, out of a possible score of 5.0.

Figure 5-3: Total Help Desk E-mail Support Cases Closed



E-mail Migration Support Cases by Topic

The following were the major topics of e-mail migration support calls:

- Familiarity with mail on the server (MAPI)
- Management of e-mail quotas
- Client automation

Client E-mail Migration Support Lessons

This section discusses several lessons learned from the e-mail migration support.

Provide Robust Support Training

"The migration support team was very pleased with the in-depth frontline training," says Branson Sossomon Jr., Cisco IT support project manager. "The training was very good and proved valuable, except for preparing them for unanticipated events. A couple of train-the-trainer sessions, including QA, were conducted at a Cisco location. These trainers, in turn, trained the rest of the staff. The Global E-mail and Calendar Program team was very quick in responding to questions."

Spread out the Change over Time

The strategy of performing e-mail migration prior to calendaring migration helped to ensure that the majority of change occurred early in the process, which helped lower the volume of calls.

The Adoption Rate was Higher than Expected

The adoption rate was higher than expected, and the how-to questions needed to be constantly updated as the migration progressed. The overall support effect on the e-mail client migration population was below 30 percent. The program team had expected that 30 out of 100 migrated users would call the migration Support group.

Report Metrics Had to be Compiled Manually

One support resource had to be dedicated to manually scrub cases in order to assign root causes to opened cases. This delayed the metrics reports, and it also kept a valuable resource from providing much needed migration support. It was not good that a full-time resource was required, when this task should either have been handled earlier, or through automation at a higher level.

Provide FAQs through Multiple Media

The Service Request Tool (SRT) and FAQs were created with meaningful questions and tips to either provide client self-help or assist support with troubleshooting steps. This was very helpful, even though it was necessary to keep updating the FAQs as the migration progressed. The FAQs were provided in the Support and IT Exchange Messaging Website, but many users did not read the information. It would have been good to provide phone menu FAQs for those who preferred this method of accessing information.

Calendar Cutover Support

This section discusses the calendar cutover support challenges, solution, and lessons learned.

Calendar Cutover Support Challenges

The calendar cutover support challenges were as follows:

- Meeting Maker had reached end-of-life support
- Scalability for a flash cutover
- Dual bookings of conference rooms
- Any delays will push out calendar migration.

Calendar Cutover Support Solution

During the two months prior to the cutover, the support group made the following preparations:

- Support personnel underwent training.
- Internal tools, such as SRT and Alliance, were set up.
- FAQs were developed by Calendar Support team members working in conjunction with the Calendar track team.
- The phone system (central support room) was set up. Physical central support rooms were set up in Asia Pacific and San Jose, but not in Amsterdam because the European and Emerging Markets had already migrated to Exchange calendaring.

After the e-mail migration and prior to the calendar cutover, the users could set up roomless meetings with Exchange calendar. During this period, support did not receive the expected volume of calls on calendars.

Calendar Conflict Resolution Tool (CCRT)

In addition, the Calendar Conflict Resolution Tool (CCRT) was developed to help resolve room booking conflicts. Once a user entered a calendar conflict case, the Help Desk (GTRC) would route it to the support room, where someone could access CCRT to query the Meeting Maker database for information. This information would allow support room and Help Desk personnel to quickly and smoothly negotiate an amicable resolution of the conflict between the affected parties.

Cutover Weekend Support Plan

The one-day cutover to Exchange calendaring took place several months after Outlook had been installed in the system. Users had been encouraged to start using Outlook for calendar appointments, even though it was not possible to book conference rooms. Before the cutover, most users had had sufficient time to obtain training and to become familiar with the calendar application.

Support Room

The support plan included direct line communications from the support room between the project team and the Help Desk from Day 1 of the cutover. Calendar support calls could be monitored by everyone in the support room, thus avoiding any need for escalation.

"During the cutover weekend, there were sufficient resources to handle all the calls that came in," says Adel Du Toit, Cisco IT calendar cutover project manager. "The main topics of the calls were 'how to' questions. The support calls were typical for the rollout of a new application. Users asked, 'How do I do this now?' or complained about the new interface, 'I don't like how this works.' These were ordinary questions for a rollout. The users did not seem to be as familiar as expected with the calendar information that they had been receiving by e-mail and through other forms of communications. Non-Windows users, however, seemed to be the most affected by the change. They complained about the interface being limited."

Day 2 Support

The Help Desk (GTRC) was ready for the Asia Pacific start of business, and the Global E-mail and Calendar Program team staffed a support room in support of the GRTC in Austin, Texas, San Jose, California, and Sydney, Australia. Updated client support documentation had already been pushed to production in a support database and in the Exchange Website. Despite the one-day cutover event, the number of problem cases was vastly lower than expected. Twenty-four-hour conference calls were open for every region but only fielded a few hundred calls. For detailed metrics for the first five days of support, see "Day 2 Calendar Cutover Support Metrics" on page D-12. Weekly call volume slowly decreased steadily over the first four weeks after the calendar cutover. Figure 5-4 shows the declining rate.

Figure 5-4: Post Cutover Weekly Calendar Case Volume

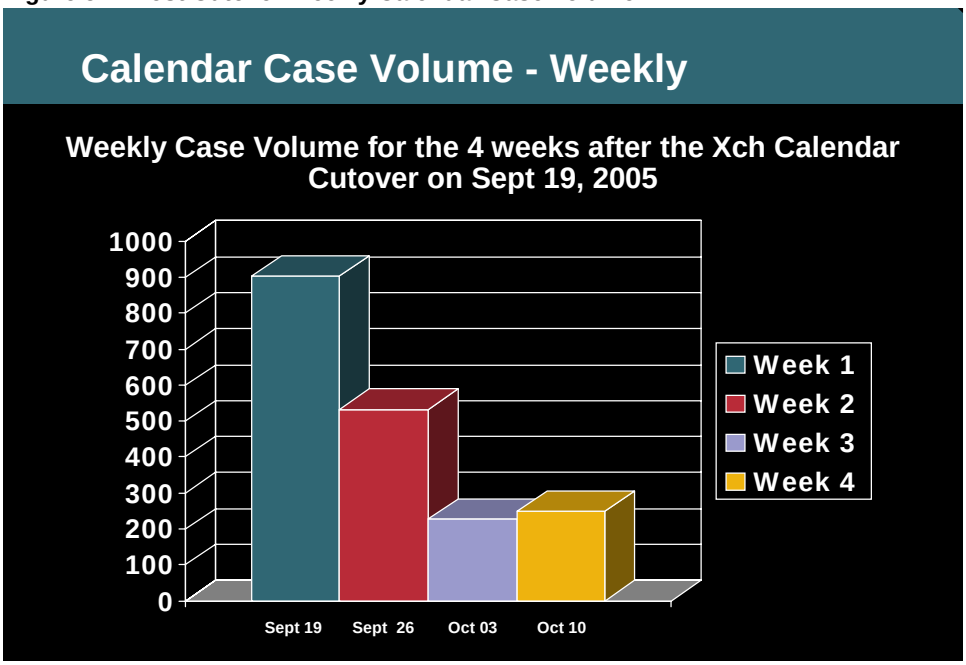
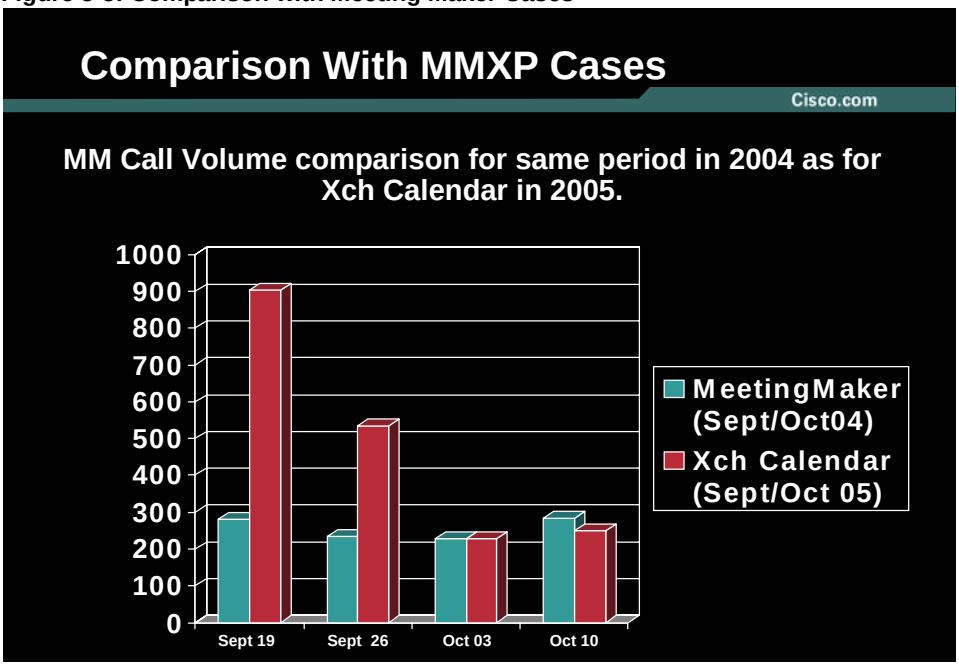


Figure 5-5 compares the call volume with Meeting Maker cases a year earlier. By the third week, the number of calls was equal to that of the previous year, and during the fourth week the number of calls was actually lower than the previous year.

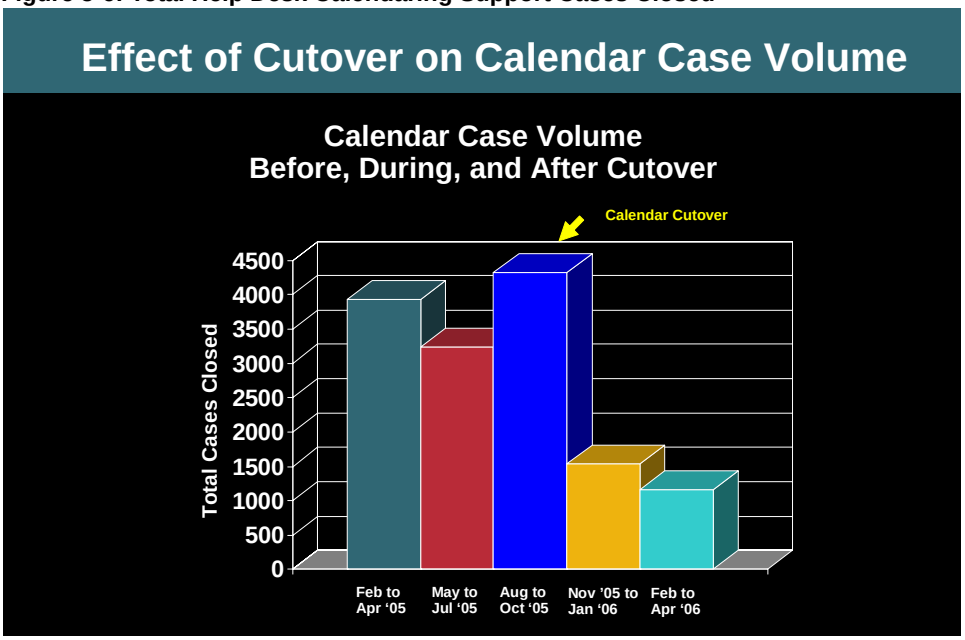
Figure 5-5: Comparison with Meeting Maker Cases



Help Desk Total Calendaring Cases

Figure 5-6 shows the total Outlook calendar cases closed by the Help Desk before, during, and after the cutover date, September19 2005. The case rate in the first quarter of 2006 was 64 percent less than in the quarter immediately preceding the calendar cutover.

Figure 5-6: Total Help Desk Calendaring Support Cases Closed



Calendar Cutover Support Lessons

This section describes lessons learned from the calendar cutover support.

Support Room Setup Days 1 to 5

A support room was set up for Days 1 to 5. Immediately following the cutover, the project team, including track leads and migration coordinators, were gathered in a single room at three locations: San Jose, California, Austin, Texas, and Sydney Australia. A phone bridge and a collaborate (chat) session were set up to connect all three support rooms. Help Desk (GTRC) personnel could call in on this line at any time and talk to everyone in the support room to get their input on how issues should be fixed. Because all the principals were gathered in one place, there was no need to escalate anything. This setup promoted teamwork between Help Desk and the migration team, and was a morale booster for all support staff.

Allow Early Access and Training to Special Users

The migration of special users to e-mail was at the end of the migration schedule, just before the calendar migration. These users did not have sufficient time to get familiar with Outlook before they had to learn the calendar application. The situation could have been avoided if the special user contact and Training had communicated better, to optimize the scheduling. On the other hand, special users were given two weeks lead time to book Exchange conference rooms. This mitigated most of the “mad scramble" to secure Exchange conference rooms on Day 1 and helped reduced the number of support calls.

APPENDIX A

E-mail and Calendar Policies and Features

Content

E-mail and Calendaring Policies

This section contains all the E-mail and Calendaring policies.

Exchange Mailbox Quota Policy

Users need to effectively manage their e-mail due to the quota limits placed on their Exchange mailbox.

The mailbox quotas for Exchange are set as follows:

Mailbox Quota	Message	Consequence
350 MB	Quota warning issued	A warning notification is issued but no restrictions are applied.
400 MB	Prohibit Send Limit	User cannot send e-mail but continues to receive e-mail
450 MB	Prohibit Send & Receive Limit	User cannot send or receive e-mail. Senders receive a delivery failure notice allowing them to send at a later time.

These quotas are neither arbitrary nor variable. The mailbox quota size rationale is dependent on a balance of server resources, current mail volumes, and projected growth. In contrast to the previous mail system, the Outlook/Exchange system makes use of the server much more than point-of-presence (POP) mail servers. Because server resources are finite, each mailbox was allocated a primary quota of server data storage, based on the current mail volume within Cisco and allowing some room for growth.

Exchange Quotas Compared to Current Mailbox Sizes

A recent audit of all current mail servers at Cisco showed that the average mailbox size was slightly less than 100 MB. While some users need to learn how to effectively manage their mailbox size, the Exchange mailbox quota limits are set higher than standard usage today. Users that were on Mirapoint servers had a 150-MB mailbox limit and are now benefiting from increased space.

Mailbox Quota Is a Change for Many Windows Users

Many Windows clients at Cisco used an Internet Message Access Protocol (IMAP)/ POP connection to their e-mail server prior to the Global E-mail and Calendar migration. A POP connection moves all server mail to the user's computer e-mail application and results in a net zero mailbox size. After the Exchange implementation, Microsoft Windows users are encouraged to use Messaging Application Programming Interface (MAPI).

Exchange Data Migration Policy

The items described in this section were not migrated to the users' Exchange mailboxes.

Contacts and Address Book

Due to the complexity of personalized Contacts and Address Book settings across the various e-mail applications at Cisco, it was not possible to programmatically migrate the data accurately to Exchange. Microsoft Windows users were provided with the Mail Import Tool for Outlook 2003 to copy contacts and address books from Qualcomm Eudora, Netscape mail, or Microsoft Outlook Express to Microsoft Outlook 2003.

Server-side Mail

Server-side mail was not copied or moved to Exchange mailboxes during migrations. Users could access their current e-mail server mailbox after completing their migration to Exchange. To retain the server-side mail, users needed to move/copy the server-side mail to a client-side e-mail application.

Server-side Rules

Due to the complexity of rules used on the current e-mail servers, and given that server-side mailbox structures were not replicated in new Exchange mailboxes, it was not possible to migrate users' current server-side rules. All client and server-side rules created are subject to the Exchange Server Rules policy.

Filtering E-mail with Exchange 2003 Server Rules

Following are important facts for using rules in Exchange 2003:

- Rules have a 32 KB limit (including both server-side and client-side rules). This equates to approximately 40 to 50 rules depending on their complexity.
- Server-based rules run even if the e-mail application is not connected.
- Server-based rules are faster than client-side rules. Client-side rules can cause performance issues because they rely upon the network to transfer and process data. (The slower the network connection, the longer these rules take to execute.)
- Rules are server-based unless the user created a rule with one of the following actions:
  - Move or copy a message to a local folder on user's computer
  - Play a sound
  - Open another program
  - Have the server reply with a specific template

Calendar Policies

No new Meeting Maker accounts were created after the calendar cutover date. All Meeting Maker servers were retired during the cutover, but users were still able to access historic Meeting Maker calendar data.

No Meeting Maker Calendar Data Migration

Meeting Maker data was not migrated to Exchange calendaring. Meeting Maker data was stored in a proprietary database, thus making it impossible to accurately replicate the Meeting Maker data in the Exchange database structure. After the cutover, users had to access historic Meeting Maker calendar data in order to migrate it. The Global E-mail and Calendar Program team investigated multiple solutions for data conversion, including server-side and client-side solutions, but found no solution that met the enterprise requirements.

Converting Data to Outlook (Client-side)

Two different client-side utilities were circulating within Cisco at the time of the migration, but these are not supported by IT. For those using these utilities, their meeting attendees are not notified when the user imported the data from Meeting Maker to Outlook. The user has to invite the attendees in Outlook Calendar. In addition, neither of the utilities is easy to manage when trying to import data from more than one calendar into Outlook. This issue is especially challenging for administrative assistants who support multiple managers, directors, or executives.

Non-Conference Room Resources

Non-conference room resources—TVs, VCRs, and projectors—are not available for booking in Exchange Calendaring. These resources require an owner of the global data feed into Exchange, and the global owners have not yet been identified. A follow-up project will be launched after the cutover to determine a global owner or a process to make non-conference room resources available for booking in Exchange.

Multiple Control Units Available in Exchange

The only exception to the NonConference Room Resources policy is videoconferencing equipment or Multipoint Control Units (MCU). MCUs—more commonly known as Video Bridges—are the only group of resources managed by a global owner; therefore, Exchange calendaring permits this.

Online/Offline Meeting Rooms

Workplace Resources (WPR) owns and manages the policies that affect online/offline conference room status. Cisco IT only implements the policies as set forth by Workplace Resources.

Requesting Changes to Conference Room Status

Workplace Resources processes all requests for changes to conference room status.

Online Meeting Rooms

Anyone at Cisco with an Exchange account can book conference rooms with an Online status. If the room is available at the selected booking time, the booking processes automatically with a confirmation of the booking displaying immediately after sending the meeting request.

Offline Meeting Rooms

Meeting rooms marked as (Offline) in Exchange are owned by a proxy. These rooms cannot be automatically booked, and the request is accepted or rejected by the room's proxy owner.

Room Booking

Due to the No Data Migration policy, after the cutover to Exchange calendaring, all users must book the same conference rooms for meetings in Exchange that they previously booked for meetings in Meeting Maker.

- Be respectful of fellow Cisco employees by only booking conference rooms for days and times required for a meeting.
- Only book meeting rooms for a maximum of one year from the initial meeting date, regardless of whether it is for an individual meeting or a recurring meeting.
- Cancel room reservations that are no longer needed.

Summit / Large Conference Room Bookings

To request the replication of a conference room booking in Exchange for a large meeting or event already scheduled in Meeting Maker, users needed to open a support case. This service was available only for the two weeks prior to the migration.

The Support Track team replicated conference room bookings in Exchange Calendar only if all the following criteria were met:

- The user required the conference room in the period from the date of the cutover up to two weeks after the cutover.
- The user required the conference room for a large meeting or event (10 or more people), or for a meeting that includes customers.
- The user had the conference room reserved in Meeting Maker and only required a replication of this booking in Microsoft Exchange Calendar. If the user could not show a booking in Meeting Maker for the same time period as the booking he or she had requested in Exchange Calendar, the booking was not replicated.

To modify an existing support-replicated booking—in case of cancellation or changes—the user must open another support case.

New Feature Functions and Benefits for Users

Table A-1 describes the major feature enhancements and benefits provided by the Global E-mail and Calendar Program. This information was included in the Exchange migration Website.

Table A-1: Feature Functions and Benefits

Enhancement	Description
Enterprisewide global calendaring	• A single global calendar across the enterprise eliminates the redundancy currently required to support multiple e-mail and calendar applications and makes possible group scheduling. • The global calendar is an integrated calendar, e-mail, contact, and task application that allows users to “mix and match” functions. For example, a personal address book list can be used for both e-mail and for proposing meetings. • The calendar solution acts as a base infrastructure for a new set of productivity-enhancing applications, such as Cisco Unified Messaging, PDA synchronization, wireless access, access from anywhere via VPN, and Web access to e-mail and calendar. • The global calendar is a Cisco-on-Cisco solution that allows users to manage and schedule MeetingPlace, voice mail, and videoconferencing, and also provides support for Mobility Mobile Mail. • Applications can be integrated. For example, training invitations become a calendar invite; resources can be embedded in the calendar; and the schedule for training classes can be set, canceled, and rescheduled in real time. • The cost of hardware and software is reduced for Cisco. • Cisco can support its clients with Cisco Unified Messaging products and services.
Integration with antivirus and antispam partners	Cisco continues to work with strategic antivirus partners, such as Microsoft, to improve security technologies. The partnerships help to attack viruses and spam in several layers: • All inbound mail servers—third-party software is installed to create the initial line of defense from Internet borne viruses/worms. • Core server layer—third-party software is installed to provide policy flexibility, such as preventing mail carrying viruses/worms from entering Cisco until a fix becomes available. • All Exchange servers—third-party software is installed with options for blocking certain attachments. At the desktop/laptop level, Cisco Security Agent is installed to detect and prompt users of any malicious behavior on the computer. Antivirus software is installed to detect and clean/delete viruses. For Windows users, Outlook 2003 provides junk mail filtering and attachment blocking. For more information, see OWA & Outlook 2003 Antivirus and Antispam.

Table A-1: Feature Functions and Benefits (Continued)

Enhancement	Description
Flexible support for Windows users	Using Outlook 2003 connected to Exchange via MAPI provides Windows users with a fully integrated e-mail and calendaring solution. Users also benefit from Cached Mode, which synchronizes Outlook 2003 with the Exchange mailbox, yet retains messages on the server. This mode allows users to view mail and calendaring offline, which is not possible when users connect Outlook 2003 to Exchange via IMAP or POP. The connection methods available are as follows: • MAPI—Outlook 2003 • IMAP/POP—Outlook 2003, Netscape Messenger, Mozilla • Eudora—POP (not recommended; has been retired since the migration)
OWA & Outlook 2003 antivirus and antispam	Microsoft improved the antivirus and antispam capabilities of Outlook 2003 and Outlook Web Access (OWA), especially when used on an Exchange 2003 mail server. The security enhancements are as follows: • Web beacon blocking—blocks the download of pictures/attachments, or blocks links with references to external content • Junk e-mail filter—manages “blocked” and “safe” senders lists • Update spam detection—notifies user when e-mail is moved to the Junk E-mail folder • E-mail attachment blocking—associated with unsafe files • Address book blocking—prevents programs from sending e-mail from user’s address book • External content blocking—blocks references to external content
Improved e-mail performance	This upgrade provides performance enhancements for clients such as on-the-fly compression of e-mail between Outlook and Exchange. This feature is of particular benefit to dial-up and remote users. **Note**: The new performance enhancements are only valid when using Outlook 2003 in conjunction with an Exchange 2003 server.
Improved Outlook Web Access (OWA)	Microsoft Office Outlook Web Access (OWA) provided by Exchange Server 2003 was greatly enhanced with major new features, including the following: • Create Rules (server-side)—allows the user to set up simple rules on the navigation pane. These rules also function in the Outlook 2003 client. • Quick Flags—allows the user to visually mark those e-mail items that need further action. These flags also display in Outlook 2003. • Spell Checker—is available in several languages and can be started manually or set up to always check spelling before sending e-mail. • Reply Header and Body Not Indented—to improve readability of e-mails that have been replied to or forwarded many times. • Meeting Requests Enhancements—forward meeting requests, send reply to meeting organizer, edit meeting cancellation notice, set reminders on meeting requests, view schedules from meeting request. • Create Personal Signature—include signature in every message. • For antivirus and antispam features, see OWA & Outlook 2003 Antivirus and Antispam.

Table A-1: Feature Functions and Benefits (Continued)

Enhancement	Description
Flexible support for UNIX/ Linux users	Exchange 2003 offers flexible e-mail options to UNIX and Linux users and allows users to choose a preferred e-mail application and connection method: • IMAP/POP—Netscape Messenger, Mozilla, Pine, fetchmail/procmail • Internet browser—Outlook Web Access (OWA) • Exchange Connector—Novell Evolution on Cisco Linux
Increased mailbox capacity	The Exchange 2003 upgrade increases mailbox capacity from 150 MB to 300 MB. Mailbox quotas were established in a new policy: • 350 MB—a warning is issued. • 400 MB—user cannot send any more e-mail but can continue to receive. • 450 MB—user cannot send or receive any more e-mail. Senders receive a delivery failure notice.
Active Directory integration	User e-mail accounts are held in Active Directory, which is tied to the Exchange system.

APPENDIX B

Communications Details

Content

Messaging Website Information Architecture

This section describes the IT Messaging Services Website Information Architecture (IA). Each bulleted item in the outline below represents a unique Webpage. For additional details, see "Website Information Architecture" on page 3-20.

- IT Services E-mail and Messaging
  - Calendaring
    - Meeting Maker
    - Evolution
      - Best Practices
        - Conference Room Booking
          - Booking Conference Rooms
          - Conference Room Naming Conventions
            - Per Region
          - Viewing Booked Conference Room Details
        - General Calendaring Functions
          - Adding Time Zones
          - Creating a Shared Team Calendar
          - Creating a Group Schedule
          - Sharing Your Calendar
          - Viewing Dates and Days of the Week
        - Roomless Meetings & Appointments
          - Creating Appointments
          - Creating Meetings with Employees
        - Quick Reference Guides
          - Translated PDFs
      - Meeting Maker Comparison Chart
      - Support
    - Outlook 2003
      - Availability
      - Benefits
      - Best Practices
      - Learning
        - Conference Room Booking
          - Booking Conference Rooms
          - Conference Room Naming Conventions
            - Per Region
          - Viewing Booked Conference Room Details
        - General Calendaring Functions

- Adding Time Zones
- Creating a Shared Team Calendar
- Creating a Group Schedule
- Sharing Your Calendar
- Viewing Dates and Days of the Week
- Viewing Specific Days or Date Ranges
- Printing Your Calendar
- Roomless Meetings & Appointments
  - Adding Attendees to Personal Appointments
  - Creating Meetings with Employees
- Quick Reference Guides
  - Translated PDFs
- Meeting Maker Comparison Chart
- Support
  - Support Q&A
- Outlook Web Access (logging into OWA)
  - Best Practices
    - Conference Room Booking
      - Booking Conference Rooms
      - Conference Room Naming Conventions
        - Per Region
      - Viewing Booked Conference Room Details
    - General Calendaring Functions
      - Adding Time Zones (Can it be done in OWA?)
      - Sharing Your Calendar (not possible in OWA)
      - Creating a Shared Team Calendar
      - Creating a Group Schedule
      - Viewing Dates and Days of the Week
    - Roomless Meetings & Appointments
      - Creating Appointments
      - Creating Roomless Meetings with Employees
  - Features: Premium vs. Basic
  - Meeting Maker Comparison Chart
  - Support
    - Support Q&A
- Technology

- E-mail
  - Qualcomm Eudora
    - Enabling Message Headers
    - Support Q&A

- Netscape and Mozilla
  - Enabling Message Headers
- Microsoft Outlook 2003
  - Best Practices
  - Installation & Setup
    - 1. Microsoft Office 2003 Installation
      - Installation Tips
    - 2. Using the Mail Import Tool
    - 3. Creating an Outlook Profile
      - Configuring a MAPI Profile
      - Configuring a POP Profile
    - 4. Adding the Cisco Directory (POP or IMAP Only)
  - Learning
    - Mail Management
      - Checking your Mailbox Size
      - Creating Form Templates
      - Downloading the Offline Address Book
      - Finding Messages with Attachments
      - Managing your Archive files/Personal folders (.pst)
      - Managing Attachments
      - Using the Out of Office Assistant
      - Using AutoArchive
      - Viewing Message Headers
    - Quick Reference Guide
    - Using Rules & Filtering Mail
      - Creating Rules
      - Guidelines for Using Rules
      - Storing Calendar Invitations
  - New Features
  - Performance Improvements
  - Support
    - Support Q&A
- Outlook Web Access (OWA)
  - New Features
- Policies
  - Mailbox Quota Size Rationale
  - Retrieving Old E-mail
    - Qualcomm Eudora
    - Mozilla Thunderbird
    - Mozilla 1.7.3 and Netscape 7.x

            - Microsoft Outlook 2003
    - UNIX & Linux Options
        - Pine
            - Enabling Message Headers
        - fetchmail/procmail
        - Novell Evolution
        - Exchange/sendmail Hybrid
    - Technology
- Exchange Messaging
    - Availability
    - Exchange Benefits
    - Calendaring Cutover
        - IPTV Broadcast Schedule
    - E-mail Migration Overview
        - Availability
    - Policies
        - Calendaring Policies
            - Asset Resources
            - Data Migration (Sumatra)
            - Online/Offline Conference Rooms (WPR)
                - Requesting Offline Conference Room Status
            - Team Calendars
        - E-mail Policies
            - Data Migration
            - Exchange Rules
            - Mailbox Quota
                - Mailbox Quota Size Rationale
    - Security
        - Attachment Blocking
    - Support
        - Support Q&A
    - Technology
        - Client Functionality
        - Hardware Components
        - Software Components
    - Tools
        - Exchange Quota Tool

Communications Plan

The Communications Plan defined the project owners and audiences, the important messages for each audience, the appropriate communication channels, and the timing for communication releases. Planned program communications activities were presented in table form and described in terms of release dates, specific delivery channels, audience, purpose, and authors. For additional details, see "Communications Plan" on page 3-25. The complete communications matrix is shown in the following tables:

- Table B-2, "Communications Schedule," on page B-7
- Table B-3, "Global E-mail Migration Communications," on page B-8
- Table B-4, "Calendar Cutover Communications," on page B-13

Table B-2: Communications Schedule

Phase	Date	Channel/ Media	Audience	Key Messages	Sponsor(s)	Development Owner	Delivery Owner	Notes
Awareness	Before final decision is reached	Exchange Website; Global page and all region availability pages	All regions	General Exchange 2003 info plus region-specific information, benefits, why we are doing this, sponsorship	None	Comms track Global PM	Comms track	This is a predecessor to all global deployment decision announcements
Awareness	As soon as final decision is reached	Corporate Employee Communications (CEC) Articles **Americas International :** Employee News **Asia Pacific :** CEC News **European and Emerging Markets:** Exec News Channel **Japan:** News headline **US:** CEC Top Story	All regions	Exchange 2003 to be deployed globally. Why, benefits, plan for rollout in each region	Chief Information Officer, Chief Development Officer, VP IT, VP, Commercial Business	Comms track Global PM	Comms track	Japan site requires translation
Awareness	As soon as final decision is reached	E-mail to “estaff”	**Primary:** Executives **Secondary:** Executive organizations	Exchange global deployment and plan for each region; Please forward to your organizations as you see appropriate	Chief Information Officer, VP IT	Comms track Global PM	CIO or executive administrative assistant	None
Awareness	As soon as final decision is reached	Engineering dashboard article	Engineers	Why the move to Exchange 2003, how 75 percent of the workforce already using Outlook 2003,plus the idea of global calendaring, etc. Explains how we are going to help engineers continue their e-mail connectivity through Mirapoint, IMAP, etc.	Engineering executive(s)	Comms track Global PM	Comms track	Need executive(s) prior to submitting on their behalf(s)
Awareness	As soon as final decision is reached	My News Clips article	Sales Force	Basic Exchange 2003 information. Also talks about Unified Messaging, but not really. As many sales staff already use Outlook 2003 with POP client, this will only be change in background. Will able to use global calendaring.	VP, Commercial Business	Comms track Global PM	Comms track	Need executive(s) prior to submitting on their behalf(s)
Awareness	As soon as final decision is reached	PowerPoint slide content	**Primary:** spokespersons **Secondary:** Regional Executives	General Exchange 2003 information plus region-specific information, benefits, why we are doing this, sponsorship	None	Comms track Global PM	Comms track	None
Awareness	June	Client Services Examiner article	All clients in the region	General Exchange 2003 information plus region-specific information, benefits	None	Comms track Global PM	Comms track	None

Table B-2: Communications Schedule (Continued)

Awareness	Sept.	European and Emerging Markets CEC Article	European and Emerging Markets	Thank you, program update, global deployment, client testimonials, install Outlook if you have not	None	Comms track, Adel Du Toit	Comms track	None
Awareness	Sept.	E-mail to EMEA-ALL mailer list	European and Emerging Markets	Personal thank you from Rod, read the recent CEC article	VP, Global Shared Services	Comms track, Adel Du Toit	Comms track	None

Table B-3: Global E-mail Migration Communications

Phase	Timing	Channel	Audience	Key Messaging

Awareness/ Understanding	June 2004, March 2005	CEC Articles	Global	• Global deployment/availability plans
				• Migration overview
				  o Flexible e-mail options
				  o Global calendaring end of FY05/early FY06
				• Client responsibilities
				• Migration policies
				• Exchange supports Cisco product strategy

Awareness/ Understanding	Monthly June 2004-March 2005	IT Services News Articles	Global	• Global deployment/availability plans
				• Migration overview
				  o Flexible e-mail options
				  o Global calendaring end of FY05/early FY06
				• Client responsibilities
				• Migration policies
				• Exchange supports Cisco product strategy

Awareness/ Understanding	June 2004, March 2005	Engineering Dashboard Articles	Engineers	• Migration overview • UNIX/Linux E-mail Options • Links back to CEC articles and Messaging Website
Awareness/ Understanding	Monthly	Global Service Delivery & Support Solutions Implementation (GSDS SI) Newsletter Articles	Global IT Infra Management & Business Client Management	• Program strategy • Deployment/migration statistics per region • Program issues & resolutions per region

Awareness/ Understanding	June 2004, March 2005	E-mail to “estaff” alias	All Executives	• Global deployment/availability plans
				• Migration overview
				  o Flexible e-mail options
				  • Outlook 2003 availability
				  • UNIX/Linux e-mail options
				  o Global calendaring end of FY05/early FY06
				• Exchange supports Cisco product strategy
				• Links to CEC articles and Messaging Website

Awareness/ Understanding	Monthly	Spokesperson Voicemail Script and PowerPoint Slides	Field Sales Management	• Global deployment/availability plans and timelines • Migration overview • Client responsibilities • Migration policies

Table B-3: Global E-mail Migration Communications (Continued)

Phase	Timing	Channel	Audience	Key Messaging

Awareness/ Understanding	June 2004, March 2005	My News-Clips Article	Sales Force	• Exchange supports Cisco product strategy
				• Global deployment/availability plans
				• Migration overview
				  o Flexible e-mail options
				  • Outlook 2003 availability
				  • UNIX/Linux e-mail options
				  o Global calendaring end of FY05/early FY06
				• Links to CEC articles and Messaging Website

Awareness/ Understanding	March-April 2005	IT Support Notices	Global	• US & Americas International migrations started • Asia Pacific & Japan migrations started • Links to CEC articles and Messaging Website
Awareness/ Understanding	February – April	Town Hall Road Show	San Jose, RTP, Boxborough, Austin, Richardson, Petaluma	• Cisco market strategy – product direction • Flexible e-mail environment • Global calendaring • Exchange 2003 features and security improvements • E-mail options for Microsoft Windows, Linux, and UNIX users • Migration Overview • Migration Timeline
Awareness/ Understanding	February	Town Hall Road Show Presentation PDF	Global	• Cisco market strategy – product direction • Flexible e-mail environment • Global calendaring • Exchange 2003 features and security improvements • E-mail options for Microsoft Windows, Linux, and UNIX users • Migration Overview • Migration Timeline
Awareness/ Understanding	April 21	Town Hall IPTV Broadcast	United States and Americas International	• Cisco market strategy – product direction • Flexible e-mail environment • Global calendaring • Exchange 2003 features and security improvements • E-mail options for Microsoft Windows, Linux, and UNIX users • Migration Overview • Migration Timeline
Awareness/ Understanding	April 25	Town Hall Video on Demand (VoD)	Global	• Cisco market strategy – product direction • Flexible e-mail environment • Global calendaring • Exchange 2003 features and security improvements • E-mail options for Microsoft Windows, Linux, and UNIX users • Migration Overview • Migration Timeline

Table B-3: Global E-mail Migration Communications (Continued)

Phase	Timing	Channel	Audience	Key Messaging
Awareness/ Understanding	Prior to Exchange account creation	Phase 1 - E-mail 1	Individual Client	• Cisco is migrating to Exchange as the new standard for e-mail and calendaring • We are creating your Exchange account for you • You do not need to do anything at this time • Do not connect to Exchange until your invited to perform your migration • This will not interrupt your current e-mail delivery • You may begin preparing for your future Exchange migration o Microsoft Windows instructions o UNIX/Linux instructions
Awareness/ Understanding	After Exchange account creation	Phase 1 – E-mail 2	Individual Client	• Your Exchange account was successfully created for you • Your e-mail is now being delivered through Exchange to your current e-mail server • This will not interrupt your current e-mail delivery • You do not need to do anything at this time • Do not connect to Exchange until your invited to perform your migration • Cisco is migrating to Exchange as the new standard for e-mail and calendaring • You may begin preparing for your future Exchange migration o Microsoft Windows instructions o UNIX/Linux instructions
Acceptance/ Adoption	Varying delivery	Systems Engineer Director (SED) E-mail Reminder	United States & Americas International Field Sales	• Please support the Exchange migration process • Look for Exchange Program e-mail notifications
Acceptance/ Adoption	3 weeks prior to migration	Phase 2 – E-mail 1	Individual Client	• Mark your calendar: Exchange e-mail migration starts soon • Your migration week is scheduled to start on {date} • You may perform your migration any day during your migration week • You may reschedule your migration week • Migration overview • You may begin preparing for your future Exchange migration o Microsoft Windows instructions o UNIX/Linux instructions • Support availability
Acceptance/ Adoption	2 weeks prior to migration	Phase 2 – Voicemail 1	Individual Client	• This message is to remind you that you are scheduled to migrate to Exchange e-mail. • Over the next two weeks, the Global E-mail and Calendar Program team will send you important e-mail messages with instructions to help you prepare for your migration and provide information about the e-mail options available to you. • Exchange Calendaring will replace Meeting Maker scheduling when 100 percent of your region has migrated to Exchange e-mail. • Thank you for preparing to migrate to Exchange.

Table B-3: Global E-mail Migration Communications (Continued)

Phase	Timing	Channel	Audience	Key Messaging

Acceptance/ Adoption	1 week prior to migration	Phase 2 – E-mail 2	Individual Client	• Action requested: Prepare to migrate to Exchange e-mail
				• Reminder that your migration week is scheduled to start on {date}
				• You may perform your migration any day during your migration week
				• You may reschedule your migration week
				• Migration overview
				• Prepare now for your future Exchange migration
				  o Microsoft Windows instructions
				  o UNIX/Linux instructions
				• Support availability

Acceptance/ Adoption	Day 1 of migration week	Phase 2 – Voicemail 2	Individual Client	• Your Exchange e-mail migration week starts today • You may perform your migration any day this week. • Please look for an important e-mail message from the Global E-mail and Calendar Program team and follow the instructions to start your Exchange migration. • I encourage you to print the e-mail message for your reference. • The migration process is your opportunity to choose the operating system and e-mail application that you will use to connect to your Exchange mailbox. • Thank you for completing your Exchange migration this week.

Acceptance/ Adoption	Day 1 of migration week	Phase 2 – E-mail 3	Individual Client	• Action required: Please begin migrating to Exchange e-mail now
				• Your migration start today
				• Step 1: Log into the Exchange Migration Application
				• Step 2: You will receive an e-mail with instructions for connecting your e-mail application to your Exchange mailbox
				• Make final preparations, if necessary
				  o Microsoft Windows instructions
				  o UNIX/Linux instructions
				• Support availability

Acceptance/ Adoption	1 week after migration week start	Phase 2 – E-mail 3.a	Individual Client	• Urgent: Please migrate to Exchange e-mail now
				• You were recently invited to Exchange e-mail, but have not started your migration
				• If you do not take immediate action, your delayed migration will be escalated
				• Log into the Exchange Migration application to begin the process
				• Make final preparations, if necessary
				  o Microsoft Windows instructions
				  o UNIX/Linux instructions
				• Outlook Web Access (OWA) availability
				• Support availability

Table B-3: Global E-mail Migration Communications (Continued)

Phase	Timing	Channel	Audience	Key Messaging
Acceptance/ Adoption	2 weeks after migration week start	Phase 2 – E-mail 3.b	Individual Client	• Urgent: Please migrate to Exchange e-mail now • Please be advised that your manager has been copied on this e-mail • You were recently invited to Exchange e-mail, but have not started your migration • If you do not take immediate action, we will automatically migrate you to Exchange e-mail on {date} • Log into the Exchange Migration application to begin the process • Make final preparations, if necessary o Microsoft Windows instructions o UNIX/Linux instructions • Outlook Web Access (OWA) availability • Support availability
Acceptance/ Adoption	2 weeks + 3 days after migration week start	Phase 2 – E-mail 3.c	Individual Client	• Notice: We are migrating you to Exchange e-mail now • Please be advised that your manager has been copied on this e-mail • You have not acted upon the previous migration notifications sent to you, so we are now migrating you to Exchange e-mail • Outlook Web Access (OWA) availability • Support availability
Acceptance/ Adoption	Client completes migration	Phase 2 – E-mail 4	Individual Client	• Action required: Please finish migrating to Exchange e-mail now • Your mailbox is now ready for use • All future e-mail will be delivered to your newly activated Exchange mailbox • Important final migration step: You will receive an e-mail with instructions for connecting your e-mail application to your Exchange mailbox • Support availability
Acceptance/ Adoption	Exchange account configuration complete	Phase 2 – E-mail 5	Individual Client	• Productivity Tips for E-mail on Exchange • Welcome to Exchange – the new Cisco standard for e-mail • All of your e-mail is now being delivered to your Exchange mailbox • Microsoft Windows productivity tips links • Microsoft Windows learning options • UNIX/Linux configuration information • Outlook Web Access (OWA) availability • Support availability
Acceptance/ Adoption	1 week after migration complete	Phase 2 – E-mail	executive administrative assistants and power users	• Enroll in and complete Outlook learning • Learning module contents • Log into Global Learning Management System (GLMS) to enroll today

Table B-4: Calendar Cutover Communications

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
--	July 08	IT Services Newsletter	All users	Global update on e-mail and calendar	• E-mail migration update • Canada FSO success story • Calendaring update o Data migration vendor analysis in progress o Cold cutover possibility	Comms track lead	Delivered
--	July 13	E-mail	MeetingMaker users	• Data purge notification • Awareness of upcoming cutover	• Exchange calendar will replace MeetingMaker • Application options for Exchange calendar • Start using Exchange calendar for roomless meetings and appointments	Comms track team	Delivered
--	July 18	E-mail	MeetingMaker users	• Data purge notification • Awareness of upcoming cutover	• Exchange calendar will replace MeetingMaker • Application options for Exchange calendar • Start using Exchange calendar for roomless meetings and appointments	Comms track team	Delivered
--	July 21	E-mail	MeetingMaker users	• Data purge notification • Awareness of upcoming cutover	• Exchange calendar will replace MeetingMaker • Application options for Exchange calendar • Start using Exchange calendar for roomless meetings and appointments	Comms track team	Delivered
Cutover Decision	August 1	E-mail	• IT senior staff • IT spokespersons • CTaPS managers • Stakeholders	Inform IT executives of cutover decision	• Exchange e-mail migrations near completion • Exchange calendar will replace MeetingMaker • Cold cutover approach • Administrative assistant early access • Open a case for large meetings/summits • Decision criteria	• Mgr, IT Enterprise Messaging Services (EMS) • Director, IS	Delivered
--	August 5	IT Services newsletter	All users	General awareness of cutover	• Exchange calendar will replace Meeting Maker for conference room booking • Cold cutover approach • Employees may choose to use Microsoft Outlook 2003, OWA or Novell Evolution for Microsoft Exchange calendaring. • Start using Exchange calendaring for roomless meetings and appointments • Calendar policies • Outlook 2003 formal learning options • Microsoft OWA and Novell Evolution best practices coming soon		Delivered

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-4 weeks	August 22-24	Staff e-mail	Senior executives	• Quota information and Mail Management Best Practices and Learning • Inform Cisco executives of calendar cutover • Request they cascade e-mail through their organizations	• Quota information and Mail Management Best Practice and Learning • Cutover process • Cutover date • Link to Corporate Employee Connection (CEC) article	VP, IT	
T-4 weeks	August 22	E-mail	• CTaPS managers • Infrastructure Directors • spokespersons	Monthly program update	TBD	Program Manager	
T-4 weeks	August 22-24	CEC article #1	All users (U.S, Asia Pacific)	• Awareness of cutover date • Awareness of cutover process	• Exchange calendar will replace Meeting Maker • Cutover date • Cutover process • Calendar policies • Learning options	Comms track lead	Delivered
T-4 weeks	August 22	E-staff e-mail	Executives	• Inform Cisco execs of calendar cutover • Request they cascade e-mail through their orgs	• Data migration vendor decision/analysis • Cutover process • Cutover date • Link to CEC article	VP, IT	
T-4 weeks	August 22	Engineering dashboard news	Engineers	Inform engineers of CEC article	• Engineering dashboard news link to CEC article	Comms track lead	Delivered
T-4 weeks	August 22	E-mail	Executive administrative assistants	• Awareness of cutover date • Awareness of cutover process	• Early access coming • Cutover date • Cutover process • Calendaring policies • Learning options		Delivered
T-4 weeks	August 29	E-mail	Executive administrative assistants	• Awareness of cutover date • Awareness of cutover process	• Early access now available • Cutover date • Cutover process • Calendaring policies • Learning options		Delivered
T-3 weeks	August 29	Direct E-mail #1	All users – MeetingMaker lists	Awareness of cutover	• Exchange Calendar will soon replace MeetingMaker • Calendaring application options • Start using Exchange Calendar for roomless meetings & appointments • Read the Exchange Calendar Cutover Webpage for details	Comms track lead	Delivered
T-1+ week	Sept. 2	IT Services newsletter	All users	Awareness of cutover	• Exchange calendaring cutover in X days! • Learning options	Comms track lead	Delivered

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-4 weeks	August 22	E-mail	Executive administrative assistants	• Awareness of cutover date • Awareness of cutover process	• Early access follow up • Cutover date • Cutover process • Calendaring policies • Learning options		Delivered
T-2 weeks	Sept. 7	Calendar Invite	All users – MeetingMaker lists	• Awareness of cutover date • Understanding how to accept a calendar invite • Understanding how to view calendar	• Meeting Maker will be retired on September 16		
T-2 weeks	Sept. 7	Calendar Invite	All users – MeetingMaker lists	• Awareness of cutover date • Understanding how to accept a calendar invite • Understanding how to view calendar	• Exchange will replace Meeting Maker on Sept. 19		
T-2 weeks	Sept. 5	Cisco@Work Success Story	Global sales force	Awareness of cutover	• Cutover date and process • Data migration policy • Canada FSO now using • Exchange for roomless meetings and appointments • Learning options	Comms track lead	
T-2 weeks	Sept. 5	My News-clips article	Global sales force	Awareness of cutover	• Read the latest Exchange success story	Cisco @ Work	
T-2 weeks	Sept. 5	Direct V-mail #1	All users – MeetingMaker lists	Understanding of cutover	• Cutover date • Read important e-mail sent from Cisco IT—Exchange Calendaring Team • Printed Outlook 2003 QRG sent to mailboxes • OWA QRG PDF available online	• CIO • Director, IS, Japan	Delivered
T-2 weeks	Sept. 5	E-mail	Administrative assistants	• Awareness of cutover to Exchange calendaring • Awareness of QRG distribution • Forward to group aliases as appropriate	• Printed QRG sent to mailboxes • Cutover date • Cutover process • Calendaring policies • IPTV broadcast schedule • Learning options	Comms track lead	Delivered
T-2 weeks	Sept. 5	Printed QRG & Cover Letter	All users	• Awareness of cutover to Exchange calendaring • Calendaring basics learning	• Cutover date • Cutover process • Calendaring policies • Learning options • Translated QRG guides available online • OWA QRG is available online	• Training track • Comms track lead	Delivered
T-2 weeks	Sept.5	E-mail	OWA user list	Awareness of OWA QRG	• TBD	Comms track lead	

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-2 weeks	Sept. 5	E-mail	Full-time telecommuters	Send out QRG PDF (or link to PDF)	• E-mail body per the QRG cover letter	Comms track lead	From ECT mailer lists
T-2 weeks	Sept. 5	E-mail	Offline room owners	Target offline room owners about pending change	• Calendaring policies • Owner actions to request offline status via WPR		Delivered by WPR
T-2 weeks	Sept. 5	IT Support Notice	All users	Awareness of cutover	• Exchange Calendar to Replace MeetingMaker • Cutover date • Start using Exchange calendaring • Learning options	Comms track lead	Delivered
T-2 weeks	Sept. 5	IT Support Notice	All users	Awareness of cutover	• MeetingMaker will be Retired • Cutover date • Start using Exchange calendaring • Learning options	Comms track lead	Delivered
T-1 week	Sept. 12	E-mail	Lobby Ambassadors	Awareness of cutover	• Early access	Comms track lead	Target list via WPR
T-1 week	Sept. 12	E-mail	Buildings where LAs book rooms for all users	Awareness of cutover	• Lobby ambassadors to send the e-mail to the buildings		
T-1 week	Sept. 5	E-mail	All Administrative assistants		• Early access coming	Comms track lead	Delivered
T-1 week	Sept. 8	E-mail	All Administrative assistants		• Early access now available	Comms track lead	
T-1 week	Sept.12	Direct E-mail #2	All users – MeetingMaker lists	Acceptance of cutover to Exchange calendaring	• Exchange Calendar will replace MeetingMaker on Sept. 12 • Calendaring application options • While many employees are looking for to this change, everyone needs to take action to help ease this transition • Take action! Read the • Exchange Calendar Cutover Webpage for details • IPTV Broadcast Schedule	Comms track lead	DRAFTED
T-1 week	Sept. 12	CEC article	All users (US, Asia Pacific)	Understanding of cutover to Exchange calendaring	• Exchange calendaring will replace Meeting Maker • Cutover date – take note of this date • Cutover process • Calendaring application options – Outlook, OWA and Evolution • Required user actions • Calendaring policies • IPTV broadcast schedule • Learning options • Printed QRG sent to mailboxes	Comms track lead	

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-1 week	Sept. 12	GTRC Welcome Message	All support users	Understanding of cutover	• Exchange calendaring will replace Meeting Maker on September 12 • Your Meeting Maker calendar will not be migrated to your Exchange calendar • You will still be able to access your Meeting Maker calendar by using the "Work Offline" button when logging into MeetingMaker	• Comms track lead • E-mail migration Support track lead	
T-1 week	Sept. 12	GTRC On-Hold Message	All support users	Understanding of cutover		• Comms track lead • E-mail migration Support track lead	
T-4 day	Sept. 12	IPTV broadcast (1hr)	All users	Acceptance of cutover to Exchange calendaring	• Calendaring cutover overview • Basic Outlook and OWA functionality learning • Formal learning options	• Comms track lead schedules • Mgr EMS / PM present	• 10am PT • 1am Singapore • 2am Japan • 3am Sydney
T-3 day	Sept.14	IPTV broadcast (1hr)	All users	Acceptance of cutover to Exchange calendaring	• Calendaring cutover overview • Basic Outlook and OWA functionality learning • Formal learning options	• Comms track lead schedules • Mgr EMS / PM present	• 1pm PT • 4am Singapore • 5am Japan • 6am Sydney
T-3 day	Sept. 15	IPTV broadcast (1hr)	All users	Acceptance of cutover to Exchange calendaring	• Calendaring cutover overview • Basic Outlook and OWA functionality learning • Formal learning options	• Comms track lead schedules • Mgr EMS / PM present	• 4pm PT • 7am Singapore • 8am Japan • 9am Sydney
T-2 day	Sept. 15	IPTV broadcast (1hr)	All users	Acceptance of cutover to Exchange calendaring	• Calendaring cutover overview • Basic Outlook and OWA functionality learning • Formal learning options	• Comms track lead schedules • Mgr EMS / PM present	• 6pm PT • 9am Singapore • 10am Japan • 11am Sydney
T-1 day	Sept. 16	Direct E-mail #3	All users – MeetingMaker lists	Adoption of Exchange calendaring	• Today is Meeting Maker's last day at Cisco! • Cutover this weekend • Calendaring application options • Take action! Read the Exchange Calendar Cutover Webpage for details • IPTV Broadcast Schedule	Comms track lead	
	Sept. 19	**Cutover Weekend**					
T-0	Sept. 19	CEC article	All users (including European and Emerging Markets)	Acceptance that conference room booking now only available in Exchange calendaring	• Global calendaring now a reality • Learning options • QRG availability • Accessing local Meeting Maker data—Work Offline	Comms track lead	Update content in previous article; especially the headline
T-0	Sept. 19	Engineering dashboard news	Engineers	Inform engineers of CEC article	• Engineering dashboard news link to CEC article	Comms track lead	

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-0	Sept. 19	Conference room poster	All users	Conference room booking available in Exchange calendaring	• Conference room booking now only available in Exchange calendaring • URL to Exchange Calendaring Website • Learning reference – "Take learning to maximize your expertise of calendaring."	• Comms track lead • WPR	
T-0	Sept. 19	E-mail	IT Senior Staff IT spokespersons	Awareness of cutover success/ failure	• Cutover update TBD		
T-0	Sept. 19	E-staff e-mail	Executives	• Inform Cisco execs of calendar cutover • Request they cascade e-mail through their orgs	• Data migration vendor decision/analysis • Cutover process • Cutover date • Link to CEC article	VP, IT	
T-0	Sept. 19	E-mail	European and Emerging Markets users	Understanding that global calendaring finally here	• All regions now using global calendaring • Thanks to European and Emerging Markets users for early adoption that paved the way towards global deployment • Start using Exchange calendaring for all meetings—across all regions	• Comms track lead draft • European executive	Edzard Overbeek
T-0	Sept. 19	Direct E-mail #4	All users – MeetingMaker lists	Adoption of Exchange calendaring	• Welcome to Exchange calendaring • Calendaring application options • Live IPTV Broadcast Learning Schedule • Learning and Best Practices by calendaring application • Support availability	Comms track lead	
T-0	Sept. 19	Direct V-mail #2	All users—MeetingMaker lists	Adoption of Exchange calendaring	• The cutover to Exchange Calendar was successful • MeetingMaker is now retired at Cisco • Read the BP and complete formal learning • Thank you for supporting Cisco in the overall migration to Exchange messaging, including e-mail and calendaring	• CIO • IS Director, Japan	Work with executive administrators to record .wav file
T-0	Sept. 19	IT Support Notice #2	All users	Understanding that cutover is complete	• Conference room booking now available in Exchange calendaring • Calendaring best practices • Learning options	Comms track lead	Exchange Global Calendaring Now Available
T-0	Sept. 19	IT Support Notice #3	All users	Understanding that Meeting Maker is unavailable	• Meeting Maker has reached its end of life at Cisco • Servers now permanently unavailable • Conference room booking now available in Exchange calendaring • You may still access your local Meeting Maker calendar by signing in with the "Work Offline" button • Link to cutover page	Comms track lead	Meeting Maker servers now permanently offline – Start using Exchange calendaring

Table B-4: Calendar Cutover Communications (Continued)

Relative Date	Delivery Date	Channel	Audience	Objectives	Key Messaging	Delivery Owner	Notes
T-0	Sept. 19	IPTV broadcast (30 minutes)	All users	Adoption of Exchange calendaring	• Core calendaring function demonstration • Formal learning options • Include Connor for major support issues	• Comms track lead schedules • Training PMs present	• 10:30 am PT • 1:30 am Singapore • 2:30 am Japan • 3:30 am Sydney
T-0	Sept. 19	IPTV broadcast (30 minutes)	All users	Adoption of Exchange calendaring	• Core calendaring function demonstration • Formal learning options • Include Connor for major support issues	• Comms track lead schedules • Training PMs present	• 1 pm PT 4 am Singapore • 5 am Japan • 6 am Sydney
T-0	Sept. 20	IPTV broadcast (30 minutes)	All users	Adoption of Exchange calendaring	• Core calendaring function demonstration • Formal learning options • Include Connor for major support issues	• Comms track lead schedules • Training PMs present	• 6 pm PT • 9 am Singapore • 10 am Japan • 11am Sydney
T-0	Sept. 21	IPTV broadcast (30 minutes)	All users	Adoption of Exchange calendaring	• Core calendaring function demonstration • Formal learning options • Include Connor for major support issues	• Comms track lead schedules • Training PMs present	• 1 pm PT • 4 am Singapore • 5 am Japan • 6 am Sydney
T+1 week	Sept. 26	E-mail	• CTaPS management Infrastructure Directors • spokespersons	Monthly program update	TBD		
T+x weeks	N+	Direct e-mail: learning reminder	All users – MeetingMaker lists	TBD by Training track	TBD	Training	Reminder
--	October 7	IT Services newsletter	All users	Ongoing learning and understanding	• Calendar best practices • Mail management best practices • Learning options • Exchange paving way for Mobile Mail	Comms track lead	Talk with Martha
T+x weeks		CEC article	All users	Ongoing awareness	• Calendar best practices • Mail management best practices • Learning options • Exchange paving way for Mobile Mail	Comms track lead	To be worked out with CEC team

APPENDIX C

Migration Data Details

Content

E-mail Migration Details

This section describes the client tasks to prepare for the migration, the e-mail migration pilot, and the migration schedule.

Expected Client Actions to Prepare for E-mail Migration

The following table lists the expected client actions during the first two steps of the migration. Frequent and timely communications to users prepared them to take these actions.

Exchange Migration Steps	Microsoft Windows Clients			UNIX/Linux Clients
	Qualcomm Eudora	**Microsoft Outlook**	**Netscape**	**Pine/Elm/etc.**
Step 1: Outlook 2003 Availability	• Clean up old mail • Install Microsoft Office 2003 • Import legacy mail • Use Outlook 2003 for e-mail • Take Outlook 2003 training • Continue Outlook 2003 training	• Clean up old mail • Upgrade to Microsoft Office 2003 • Take Outlook 2003 training • Continue Outlook 2003 training	• Clean up old mail • Install Microsoft Office 2003 • Import legacy mail • Use Outlook 2003 for e-mail • Take Outlook 2003 training • Continue Outlook 2003 training	• Install and evaluate Evolution • Review connection method options on IT Services site • Continue Evolution evaluation
Step 2: Exchange Mailbox Creation	• Respond to migration invitations • Adhere to migration schedule	• Respond to migration invitations • Adhere to migration schedule	• Respond to migration invitations • Adhere to migration schedule	• Respond to migration invitations • Adhere to migration schedule

E-mail Migration Pilot

Before starting such a large-scale migration, the team decided to conduct a pilot involving 2000 e-mail migrations for randomly selected participants scattered in the Asia/Pacific and Americas International regions. The first few hundred participants were selected from IT groups. The participants were drafted from specific areas or volunteered. For instance, the Toronto Management Support group was one of the first to agree to stop using Meeting Maker and cut over to Exchange. The goal of the migration pilot was to help ensure that there was adequate support for the migration.

Pilot Schedule

The pilot was conducted from December 2004 to February 2005. The pilot had initially been targeted to start in October 2004, but a series of delays pushed the start date to December 2004. One of the reasons that the pilot could not start in October was that the Client Migration Management (CMM) tool was not ready yet. The automation of the migration process provided by CMM was considered critical, because support actually set the pace for the migration. Also, the RTP server needed to be up and running, and the system environments needed to be ready and stable.

Because the pilot was delayed, the start date for the migrations slipped to March 2005, thus shortening the original timeframe from October-July to March-July. The migration had to be completed in half the originally estimated time.

US/Canada Wave 1 Phase 1 Mailbox Account Creation (Pilot)

The first set of notices began to be sent three weeks before the pilot started.

Amer Wave 1	Phase 1 = Mailbox creation			
Regulars Only	Pilot			
Week of:	6-Dec	13-Dec	20-Dec	27-Dec
Mbx/week:	1000	10000	15000	0
cumm totals:	1000	11000	**26000**	**26000**

US/Canada Wave 1 Phase 2 Connect to Exchange (Pilots)

The first set of notices began to be sent three weeks before the pilots started.

Amer Wave 1 Phase 2 Connect to Exch	13-Dec	20-Dec	27-Dec	3-Jan	10/Jan	17/Jan	24/Jan	31/Jan
	Pilot	Pilot	holidays	Pilot	Pilot	review& adj	review	**Begin**
Target Mig per Week:	***200***	***200***	***0***	***500***	***1000***	***0***	***0***	***2000***
cumm totals:	200	400	400	900	1900	1900	1900	3900

Asia Pacific Wave 1 Phase 2 (Pilot)

The “catch up” and RC (Special Handling) phase allowed time for reducing the backlog and adjusting schedules. The first set of notices began to be sent three weeks before the pilots started.

		10-Jan	17-Jan	24-Jan	31-Jan	7-Feb
Asia/Pac Ph 2			Pilot	Pilot	**review**	**review**
phase 2/wave 1			100	100	0	0
running totals:		0	100	200		

Lessons Learned from the E-mail Pilot

The Global E-mail and Calendar Program team learned valuable information:

- Transend, the mail-importing utility, generated more trouble cases than had been expected.
- The number of expected user queries had been underestimated. As a result of the pilot a list of FAQs was generated.
- Most of the queries were from users who were not following instructions or who did not understand the migration process. The team realized that they needed to have adequate support and improve communications.
- The migration team learned that scalability was not about process but about the ability to support users. They could successfully scale 1000 users a week.
- A high percentage of users had unofficial versions of Microsoft Office that were not compatible with the automated migration process. The automation routine was adjusted to notify these users that they had to download the official version before starting.

Calendar Cutover Details

This section describes in detail each of the three steps followed during the calendar cutover: preparation, cutover weekend, and Day 1 and beyond.

Step 1: Calendar Cutover Preparation

This step covered the time period from August 29, 2005 until the cutover, September 16, 2005. During these two weeks, support was added for the calendaring functionality within Exchange for roomless meeting requests and appointments.

Decision not to Convert Calendar Data to Exchange

Cisco IT investigated multiple solutions for converting data from Meeting Maker servers to Microsoft Exchange servers—including the major vendors in this niche solution market and the solution used for the European and Emerging Markets data conversion process in FY'04.

Given that both Meeting Maker and Exchange use proprietary database structures, a solution had to meet the following server-side data conversion requirements:

- Accurate data mapping from Meeting Maker to Microsoft Exchange calendaring
- Predictable and reliable confirmation of actual data injected with robust exception handling
- Demonstrated ability to complete data transforms and injections within 30 hours

No vendor was able to provide a solution that met all of the requirements. One vendor could convert the user data but not the calendar data and there was no time to resolve the problem. As a result, the team determined that a reliable solution did not exist to move or copy Meeting Maker data into the Exchange free/busy database.

The team also reviewed the option of using the Microsoft Exchange server import process to import data, an option that requires a very lengthy server downtime. Using the timeframe required for the European and Emerging Markets data conversion as a baseline for the required downtime, the Exchange import process would require at least seven days of Exchange server downtime to complete the data conversion for the remaining regions. Due to the importance of e-mail on Cisco employee productivity, this too was not a feasible option.

A decision was made to proceed with a cold cutover using a three-step approach, rather than delay for additional research, which would have pushed the cutover out for an additional two to three months. The original date selected, September 12, was pushed to September 19 due to an IT management meeting off site.

Enabling Conference Room Import Process

The conference room nightly update import process from the facilities (WPR) database was enabled by inserting the conference rooms from the WPR feed (WINS) into Exchange, thus bringing all rooms online. Conference rooms were imported as Exchange mailboxes without any booking data. At this time, conference rooms were invisible to everyone except power users (executive administrators, administrative assistants, and a select number of receptionists). This was accomplished by creating a separate Active Directory group to which only those users that fell into the "early-access" group were added.

Creating and Configuring Mailboxes

Conference rooms were imported into Exchange about four weeks before the cutover date of September 19. Mailboxes were created for each conference room and then configured to accept reservations. The conference rooms were not visible to the general user population at this time; only users added to the “early-access” Active Directory group could view the conference rooms.

During the one-week period prior to granting access to the power users, the project team helped to ensure the accuracy of the data, and all updates from facilities (WPR) were frozen.

Early Access to Power Users

Power users received training and added to the “early-access” group three weeks prior to the general cutover. This helped to ensure that the power users could secure special purpose conference rooms.

IPTV Calendar Precutover Training Broadcasts

Users were encouraged before the cutover to receive an overview of the calendar cutover process, available calendaring applications, and learning options. The 60-minute segment was broadcast four times from September 12 through 16.

Calendar Invitations

The calendar invitations sent included the following information:

1. Monday, August 29, 2005—Start using Outlook, OWA, or Evolution calendar today to schedule roomless meetings and invite attendees. Use Meeting Maker to book conference rooms, and then add room details to the Exchange meeting. Outlook users were prompted to take formal training. Links were provided to calendar policies and best practices.
2. Friday, September 16, 2005—Today is the last day for using Meeting Maker. Log into Meeting Maker before 6:00 p.m. PT to accept/deny all outstanding meeting requests. Print Meeting Maker schedule for September 19-23 to help ensure that you do not miss any meetings. Use “meeting tracker template” to identify all Meeting Maker meetings that you own and need to recreate after the cutover. Review calendar policies.
3. Monday, September 19, 2005—Use your preferred application for Exchange conference room booking. Use your completed “meeting tracker template” to recreate your Meeting Maker calendar in Exchange. Attend a live IPTV broadcast to receive a demonstration of core calendaring functions. Review the calendaring policies. For more details, see “Postcutover Communications” on page C-11.

Step 2: Calendar Cutover Weekend

This step covered the cutover weekend, from Friday, September 16, 2005, to Sunday, September 18, 2005, at 4 p.m. PT. The main support room was located in San Jose, California.

Support Room Setup

The support room for step 2 was set up in San Jose, California. The support room activities are described in Table C-5.

Table C-5: Calendar Cutover Weekend Tasks

Item	Task Name	Duration	Day	Start	End
1	**Meeting Maker**				
1.1	**Asia Pacific**				
1.1.1	Turn Meeting Maker Servers off	10 minutes	Friday	09.00	09.10
1.1.2	Create .dat files	2 hours	Friday	09.10	11.00
1.1.3	Place .dat files on share for development of CCRT Tool	10 minutes	Friday	11.00	11.10
1.1.4	Confirm with developer that files are placed on share	5 minutes	Friday	11.15	18.00
1.2	**US/Canada and Americas International**				
1.2.1	Turn Meeting Maker Servers off	10 minutes	Friday	18.00	18.10
1.2.2	Create .dat files	3 hours	Friday	09.10	11.00
1.2.3	Place .dat files on share for development of CCRT Tool	10 minutes	Friday	11.00	11.10
1.2.4	Confirm with developer that files are placed on share	5 minutes	Friday	11.15	18.00
1.2.5	Convert files for CCRT	9 hours	Fri/Sat	21.15	07.00
1.3	**Conflict Resolution Tool (CRT)**				
1.3.1	Make available to Help Desk (GTRC) and support room		Sunday		
2	**Exchange**				
2.1	**Conference Rooms**				
2.1.1	Data Provision all Rooms/ Change Attribute 8	2 hours	Friday	18.00	20.00
2.1.2	Implement private tag as part of data provision	0			
2.1.3	Security Reset	14 hours	Friday	will run overnight	
2.1.4	OWA Event Sink Registration Note: We will leave the EA address book set up in place.	1 hour	Friday	20.00	21.00

Table C-5: Calendar Cutover Weekend Tasks (Continued)

Item	Task Name	Duration	Day	Start	End
2.2	**Testing**				
2.2.1	Execute full testing of all Calendar functionality associated with Conference Room Booking per Test Plan	3 hours	Saturday	13.00	16.00
2.3	**GO / NO GO DECISION**				
2.3.1	Discuss any issues encountered during cutover and identify show stoppers (if any) for back out.	1 hour	Saturday	16.00	17.00
3	**Support—Help Desk (GTRC—Global Technical Response Center)**				
3.1	**Update Phone Wait Message to Include:**				
3.1.1	Conference Rooms are found in the Global Address List (GAL) under Conference Rooms and then US/Canada and Americas International, Asia Pacific, or European and Emerging Markets. If you cannot view the rooms or receive and invalid bookmark error, please download the Offline Address Book by selecting Tools, then Send and Receive, and then Download Address Book.	30 minutes	Sunday		
3.1.2	Attend an IPTV session this week to learn how to resolve the top Outlook Calendar issues. Read the CEC article for the IPTV broadcast schedule.	N/A	Sunday?	?	?
4	**Communications**				
4.1	**E-mail and Voicemail**				
4.1.1.	Send Calendar “now available” e-mail	1 hour	Sunday	13.00	14.00
4.1.2	Send Brad Boston voicemail	30 minutes	Sunday	13.00	13.30

First Leg Completed: Saturday, September 17, 4:17 a.m. PT

Completed all the activities associated with the first leg of the cutover from Meeting Maker to Exchange Calendar, as follows:

- Meeting Maker:
  - Turned Off /Disabled all Meeting Maker Servers globally on Friday evening. Users can still reference their historical records.
  - Created .dat files and placed them on a share in preparation for the creation of the Conflict Resolution Tool (CRT).
- Exchange:
  - Data-provisioned all rooms. Changed Attribute 8 to bring all rooms to the correct status—Online, Offline, or Private—for booking after cutover. The conference room names were made visible in a global address list (GAL).
  - Security reset was initiated to allow all Cisco users to see the conference rooms. The estimated run time was approximately 16 hours starting on Saturday, September 17, 7 p.m. Pacific Time.

— OWA Event Sink Registration is complete.

Second Leg Completed: Saturday, September 17, 11:40 p.m. PT

Completed all the activities associated with the second leg of the cutover from Meeting Maker to Exchange Calendar, as follows:

- Meeting Maker:
  - All .dat files had been imported to be visible in the CRT, which was at that moment in the development environment. The initial testing was successful.
  - System was ready to push the CRT to production and grant permissions to conflict resolution personnel.
- Exchange:
  - Security Reset was completed for Online, Offline, and Private rooms.
- Issues Encountered
  - Security reset for conference rooms could not be performed from a server that had not allowed MAPI connections to set the security of the rooms.
  - Security reset for Offline and Private Rooms had to be redone due to vendor display name change.
  - The address book setup for conference rooms was not displaying the conference rooms when filtering down to the United States, Canada, and Americas International, as well as Asia Pacific.

Third Leg Completed: Sunday, September 18, 3:40 p.m. PT

All server-side activities associated with the readiness for go-live with Exchange Calendar had been completed. Client notifications were scheduled for September 18, at 4 p.m., prior to start of the Asia Pacific business day. The Go / No Go decision point was 4:00 p.m. PT, at which time the team had a readiness indication.

- Summary of Changes
  - All Meeting Makers were offline.
  - Global conference rooms could be reserved by all Exchange users in the global address list (GAL)
  - Test bookings had been completed for Novell Evolution, and Microsoft Outlook and OWA clients.
  - The Offline address book replication would complete before the start of business day in Asia Pacific.
- All Issues Resolved
  - Security reset for conference rooms could not be performed from a server—server restart resolved the issue.
  - Vendor display name change required changing the scripts and testing to help ensure that the issue was resolved.
  - Address book view not displaying the conference rooms—reset of security for the address book resolved the issue.

Step 3: Day 1 and Beyond

The final step covered the post-cutover time period beginning with the start of business in Australia corresponding to Sunday, September 18, at 4 p.m. Pacific Time (PT). Because of the global time zones, the team had to help ensure that the system was in place and running on APAC Monday morning. Users could start recreating their scheduling and conference bookings in Microsoft Outlook, Microsoft OWA, or Novell Evolution.

Support Rooms Setup

Support rooms for step 3 were set up at three locations: Sydney, Australia; Austin, Texas; San Jose, California. Eight-hour shifts were staggered in order to cover the schedule allocated to each location. The time shown in the following table is in Pacific Time (PT). Each support room was connected to a bridge that was opened daily by the Austin support room. The bridge ran the whole time that the support rooms were staffed. The Chair Pin was assigned to the designated support room lead. During the cutover weekend, the Chair Pin was assigned to the Calendar Cutover project manager.

Date	Location	Staff	Start			End		
			SYD	AST	SJ	SYD	AST	SJ
Sunday 18 September	Sydney (SYD)	1	9am	4pm	6pm	5pm	12am	2am
	Austin (AST)	3	2pm	5am	12am	6pm	9am	4pm
	San Jose (SJ)	3			6pm			9pm
Monday 19 September	Sydney	1	9am			5pm		
	Austin	4		7am			6pm	
	San Jose	10			9am			6pm
Tuesday 20 September	Sydney	1	9am			5pm		
	Austin	4		7am			6pm	
	San Jose	10			9am			6pm
Wednesday 21 September	Sydney	1	9am			5pm		
	Austin	4		7am			6pm	
	San Jose	10			9am			6pm

Support Rooms Responsibilities

The support room personnel had the following responsibilities:

- Handled escalations
- Created FAQs as needed
- Created communications/website updates as needed
- Responded to daily questions coming in from IPTV viewers
- Monitored and responded to xch-calendaring-feedback alias
- If needed, set up ad-hoc QA sessions for groups of users

Recreate Schedules and Bookings

Users were encouraged to migrate their own calendar data from Meeting Maker to the Exchange calendar, and to recreate their conference room bookings in Exchange. The Calendar Cutover team used strategic communications to convey this message to the users.

Postcutover Communications

The following announcements were scheduled to be delivered or available at start of business, Monday, September 19:

- A pre-recorded IPTV broadcast, set up to run daily from September 19 through 22, provided information on how to migrate calendar data and recreate bookings in Outlook 2003 and Outlook Web Access (OWA).
- “Exchange Calendar now available” e-mail message was sent on Day 1.
- A pre-recorded voicemail from Brad Boston, Chief Information Officer, was sent on Day 1.
- An e-mail from Edzard Overbeek, vice president of European Markets, was sent to all European and Emerging Markets users on Day 1.

APPENDIX D

Support Details

Content

Operational Support

Server Functions Distribution

The following table lists the total server hardware components located at the hubs (San Jose, RTP, Hong Kong, and Bangalore). The hardware configuration is described in the Architecture module.

Component	Total
Number of Pods	7
Mailbox Servers	71
Bridgehead Servers	9
Free/Busy Servers	7
Front-End Servers	14
Hot Spare Servers	7
Backup Servers	7
Total Server Count	115

Software (Operating System) Configuration

The basic operating system (OS) components and software are listed in the following table.

Component	Description
Operating System	• Microsoft Windows 2003 Standard Edition
Installation	• WINES
Additional Components	• IIS Admin, NNTP, WWW • Terminal Services in Administration mode • ASP.NET
Additional Software	• Third-party server protection software • Netbackup 4.5 • EMC Powerpath (only servers that attach to the SAN) • EMC Navisphere (only servers that attach to the SAN) • NETIQ agent (or replacement monitoring solution) • Windows support tools • Windows Resource kit

Application Support Escalation Processes

This section describes escalation process defined in different regions.

Escalation Process in the United States and Canada

The DCSS-WIS team used their existing processes for hardware and OS support for Exchange and owned the documentation.

The escalation path was as follows:

1. Alliance Assignment Group
2. Contact/Escalations e-mail
3. Duty pager
4. DCSS-WIS manager
5. Biz/Hosting manager
6. DCSS manager

Escalation Process in Bangalore (Asia Pacific)

The support process for engaging DCSS-WIS for all Hardware and OS support in Bangalore was done through the Global DCSS-WIS team. This means that all interaction from the EMS team (or in the event of P1s, via the Operations team) took place via the DCSS-WIS team.

The following escalation rules applied:

- All OS issues were handled by the global DCSS-WIS team.
- If the DCSS-WIS team determined that the issue was hardware-related, it would be escalated to the India IT Hosting team.
- The India IT hosting team utilized their onsite process to cover hardware support 24 hours a day.
- In the event that the India Hosting team needed to get HP onsite, they would utilize the HP escalation matrix.

The escalation process for Bangalore Support was set up as follows:

1. Duty Pager
2. On-call duty cell number
3. Escalation manager e-page

Escalation Process in Hong Kong (Asia Pacific)

The DCSS-APJ team used their existing processes for hardware and OS support for Exchange and owned the documentation. The DCSS-APJ team provided the Enterprise Messaging Services (EMS) team with the processes that they would use for hardware and OS support. The processes included onsite process to cover P1/P2 scenarios, as well as P3 to P6 scenarios. This process includes how the interaction works between the outsourced vendors and DCSS-APJ.

The escalation process to the Asia Pacific Support team was set up as follows:

1. Alliance Assignment Group
2. Contact/Escalations e-mail
3. Duty pager

Support Processes

Process flows were developed by the EMS team to describe support functions between the EMS and the DCSS-WIS and DCSS-APJ teams. The DCSS-WIS and DCSS-APJ teams used their existing processes for hardware and OS support for Exchange and owned the documentation. The DCSS-WIS and DCSS-APJ teams provided the EMS team with the process flows that would be used for hardware and operating system (OS) support during the Global E-mail and Calendar migration, as follows:

Figure D-1: Communication and Interaction Process Flow

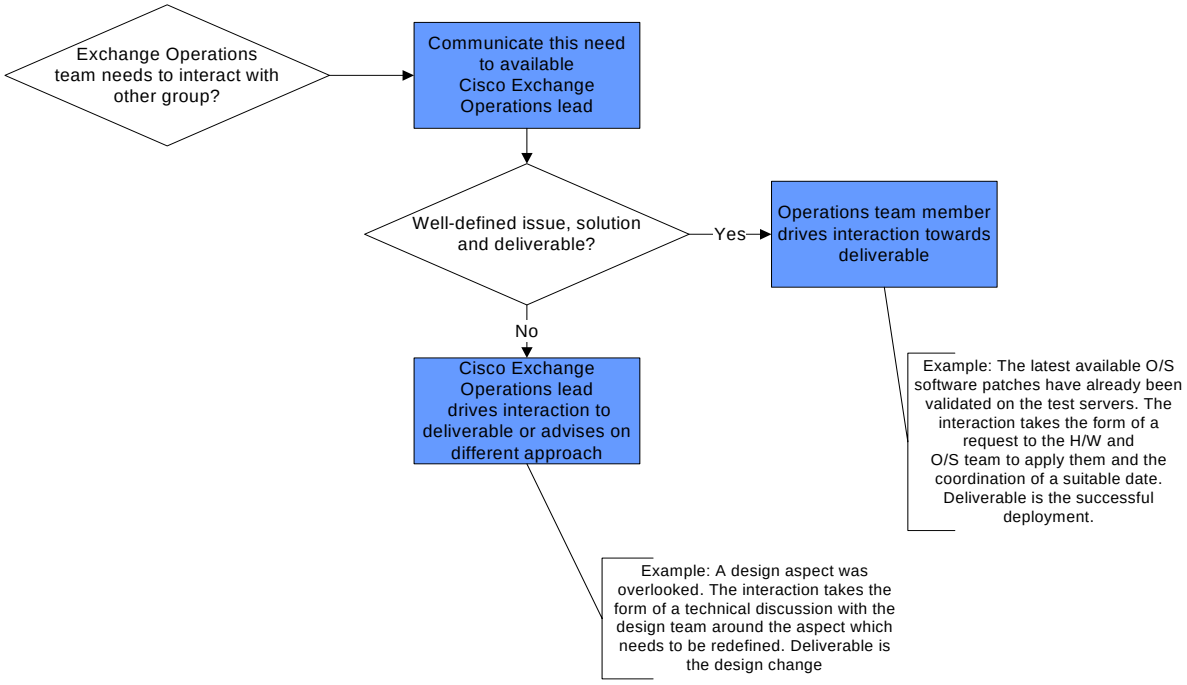


Figure D-2: Incident Start Process Flow

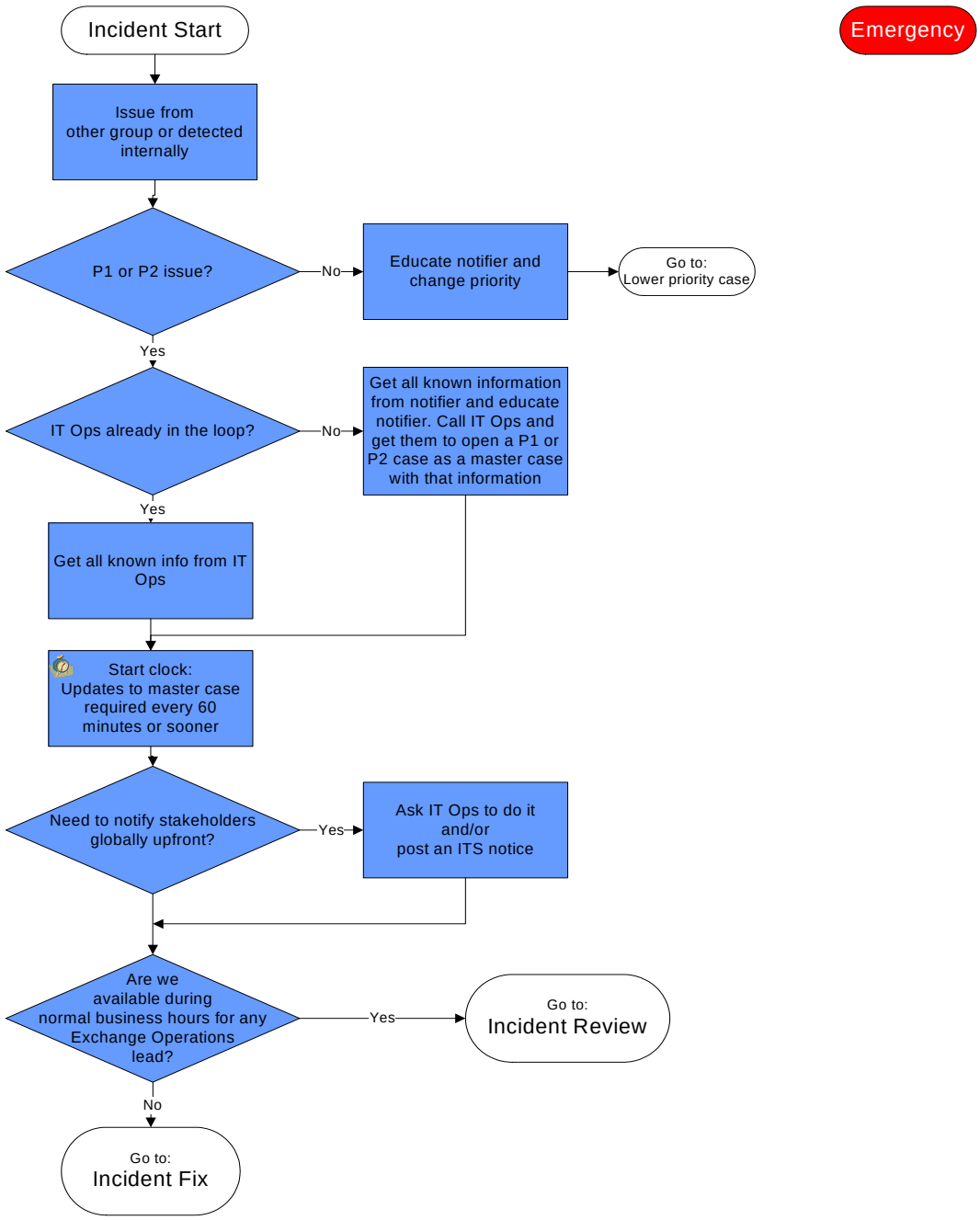


Figure D-3: Incident Review Process Flow

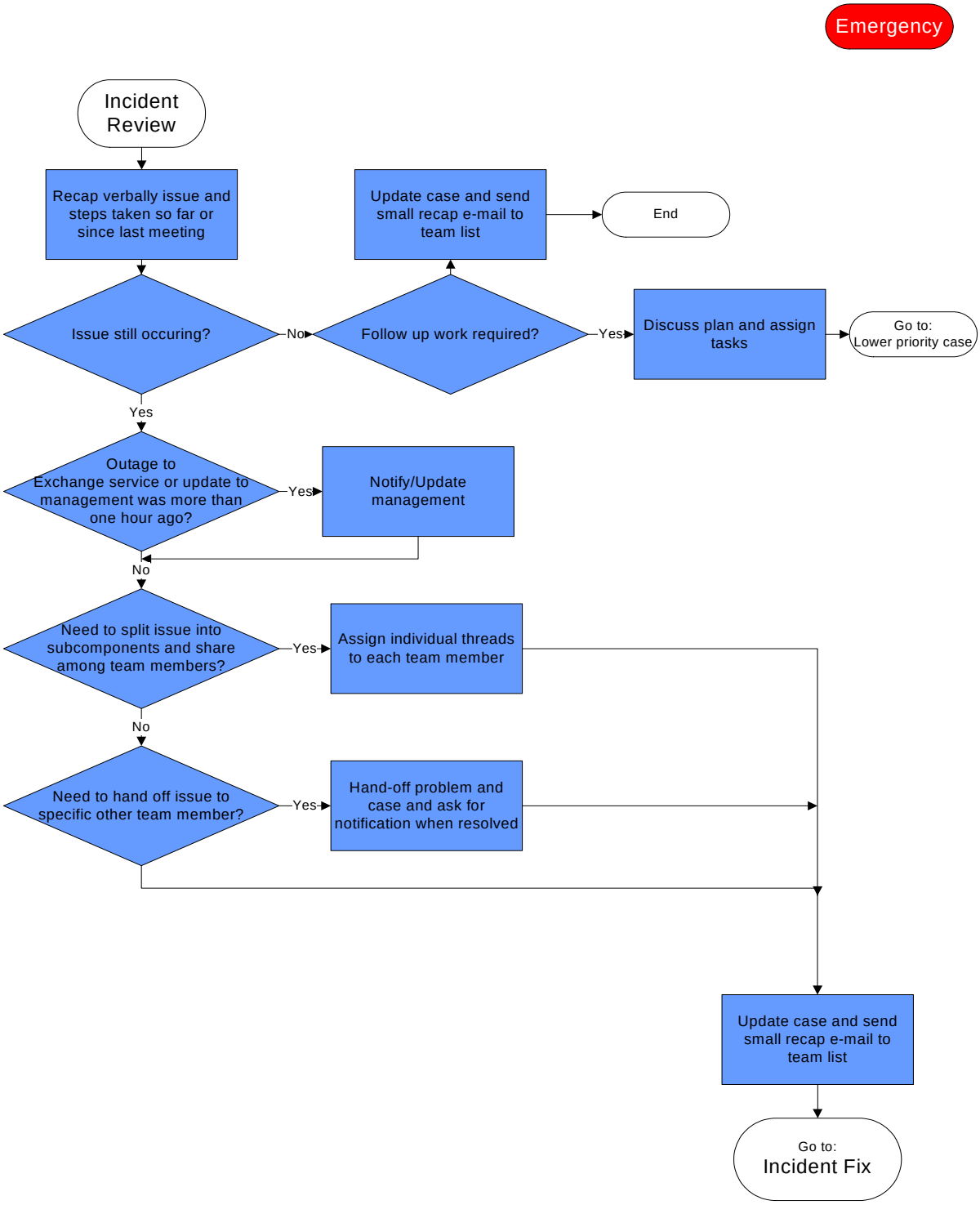


Figure D-4: Incident Fix Process Flow

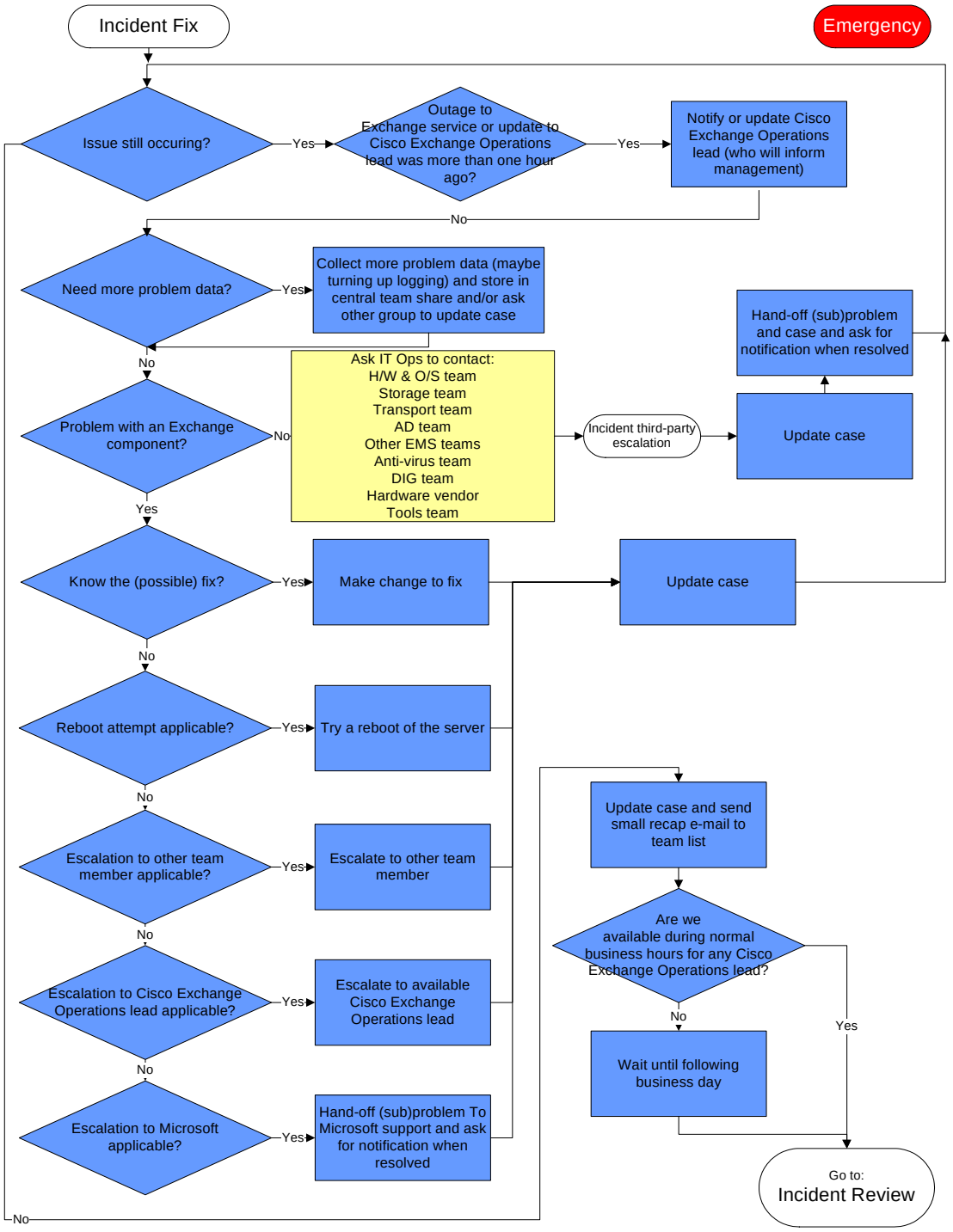


Figure D-5: Lower Priority Incident Process Flow

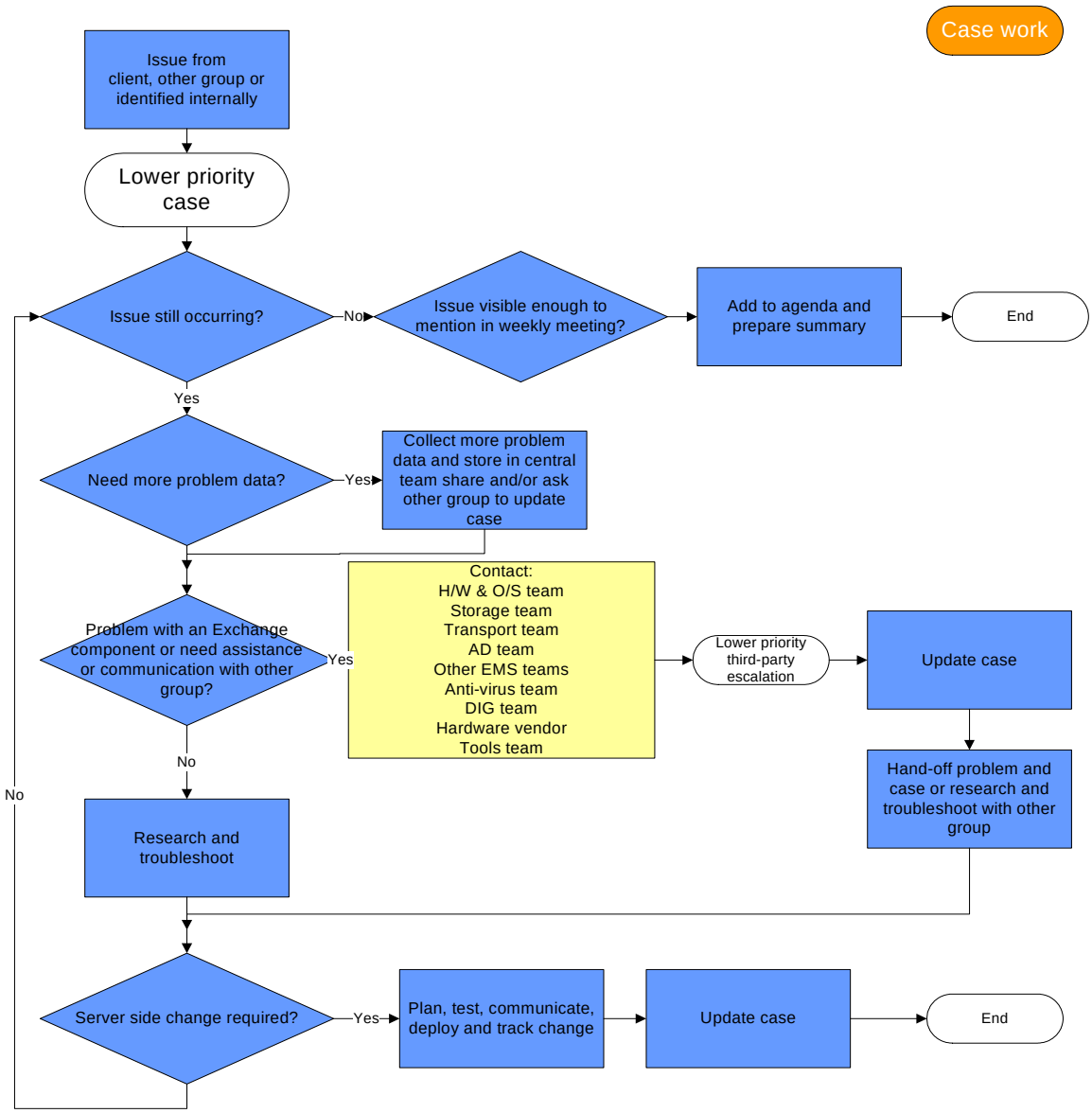


Figure D-6: Third-Party Escalations

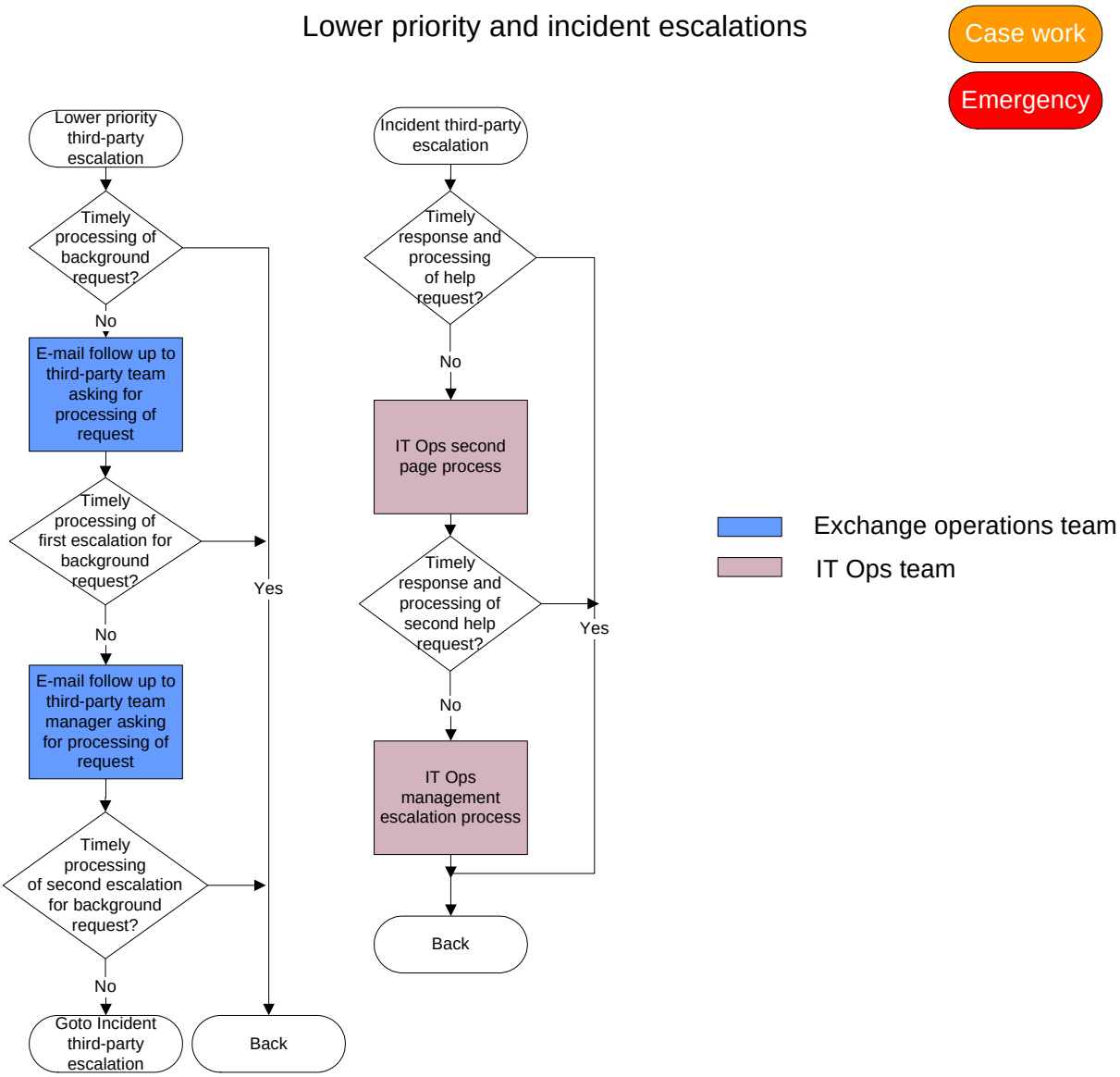


Figure D-7: Software and Firmware Upgrades

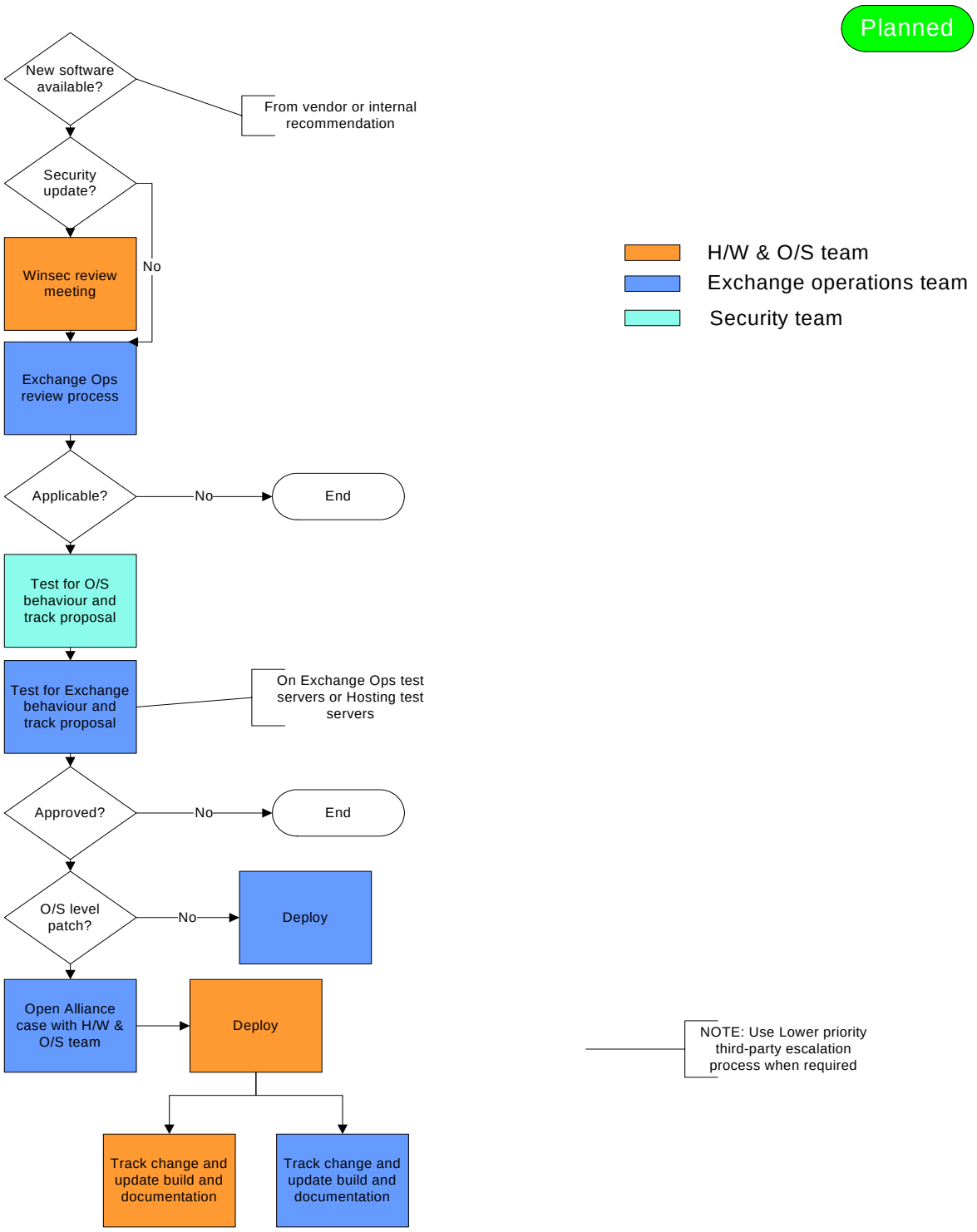
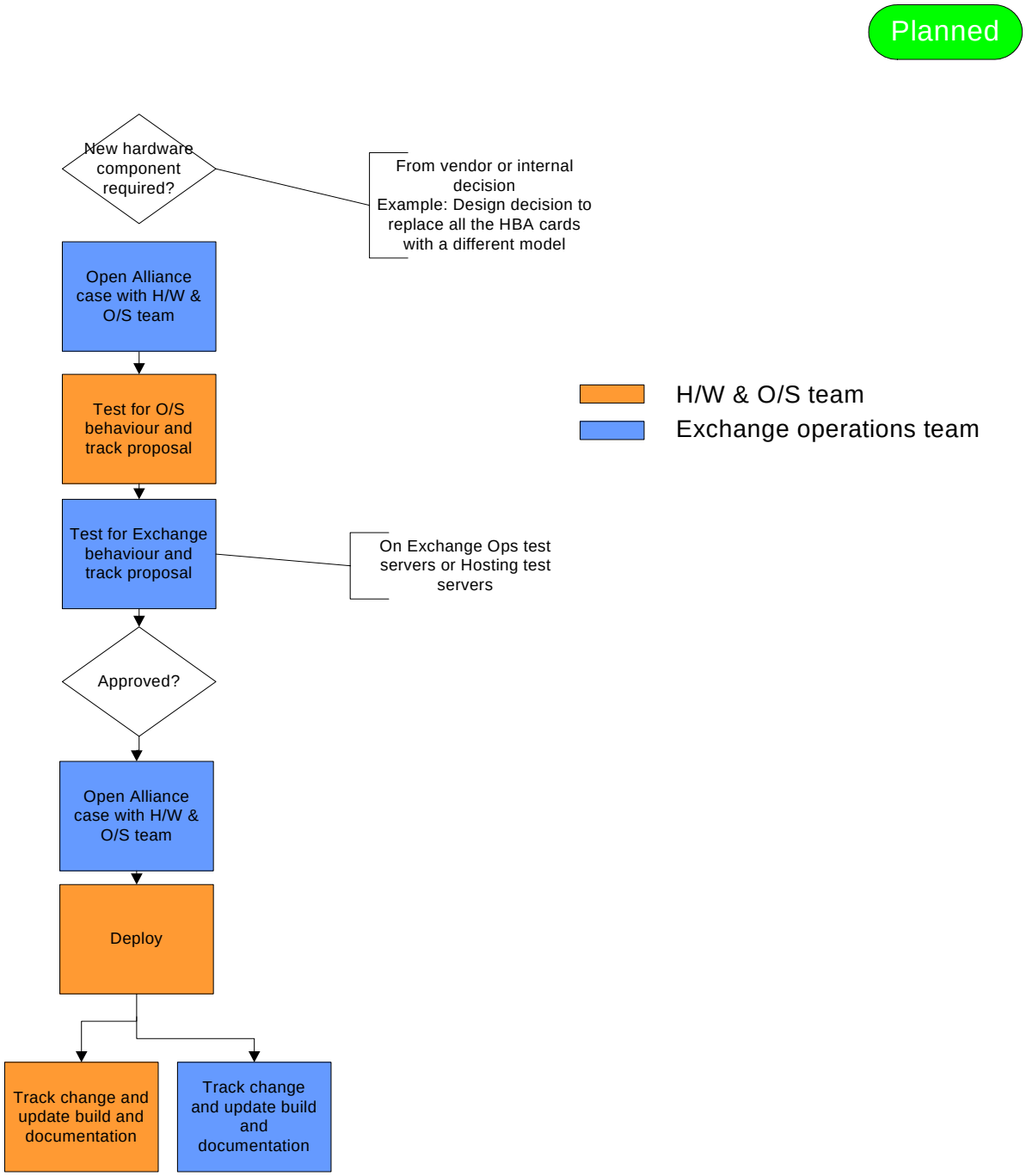


Figure D-8: Hardware Upgrades



Day 2 Calendar Cutover Support Metrics

The following table provides details on the total cutover support calls handled.

Post-Cutover	Metrics	US	APAC	Total
Day 1: Monday, September 19, 2005	Total Number of Calls	270	26	296
	Answered Calls	264	25	289
	Abandoned Calls	6	1	7
	Average Speed to Answer (sec)	47.0	9.2	43.7
	Average Service Time (min)	13.1	14.0	13.2
Day 2: Tuesday September 20, 2005	Total Number of Calls	180	41	221
	Answered Calls	175	40	215
	Abandoned Calls	5	1	6
	Average Speed to Answer (sec)	45.0	54.0	46.7
	Average Service Time (min)	12.5	15.0	13.0
Day 3: Wednesday September 21, 2005	Total Number of Calls	149	22	171
	Answered Calls	143	22	165
	Abandoned Calls	6	0	6
	Average Speed to Answer (sec)	18.7	108.0	30.6
	Average Service Time (min)	12.3	15.0	12.7
Day 4: Thursday September 22, 2005	Total Number of Calls	98	21	119
	Answered Calls	98	21	119
	Abandoned Calls	0	0	0
	Average Speed to Answer (sec)	4.8	60.0	14.5
	Average Service Time (min)	14.5	27.0	16.7
Day 5: Friday, September 23, 2005	Total Number of Calls	82	14	96
	Answered Calls	82	14	96
	Abandoned Calls	0	0	0
	Average Speed to Answer (sec)	21.0	60.0	26.7
	Average Service Time (min)	12.4	14.0	12.6

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