Messaging, Directories, Groupware, Wireless – Technology Decisions that Make Sense

Global System Services Corporation (GSS)
650 Castro Street, Suite 120, Number 268
Mountain View, California, U.S.A. 94041
1 (650) 965-8669 telephone
1 (650) 965-8679 facsimile

GSS 2004 IT Survey: E-mail and Messaging, Directory Services, Groupware, Wireless

GSS Research
1 (650) 965-8669
research@gssnet.com
http://www.gssnet.com

Contents

Tables

Figures

Survey Overview and Demographics

Between Q4 2003 and Q2 2004 Global System Services Corporation (GSS) asked companies of all sizes to participate in a survey to assess currently deployed IT infrastructure, technology trends, IT priorities and future plans. The 2004 GSS IT Survey focused on:

1. Server operating systems and Linux
2. E-mail and messaging
3. Mobile and wireless solutions
4. Directory Services, metadirectories and identity management
5. Groupware applications and infrastructure

The goals of the survey were to take a snapshot of deployed infrastructure—what companies are using today—and to determine key trends in each technology category, i.e., where companies are headed from this point.

Survey Participants by Industry and Company Size

Significant business categories in the 2004 survey included financial services, high technology (all categories except software), software, telecom (including mobile operators and Internet service providers), government organizations (US state and Federal), industrial, energy, and publishing/media (see Figure 1).

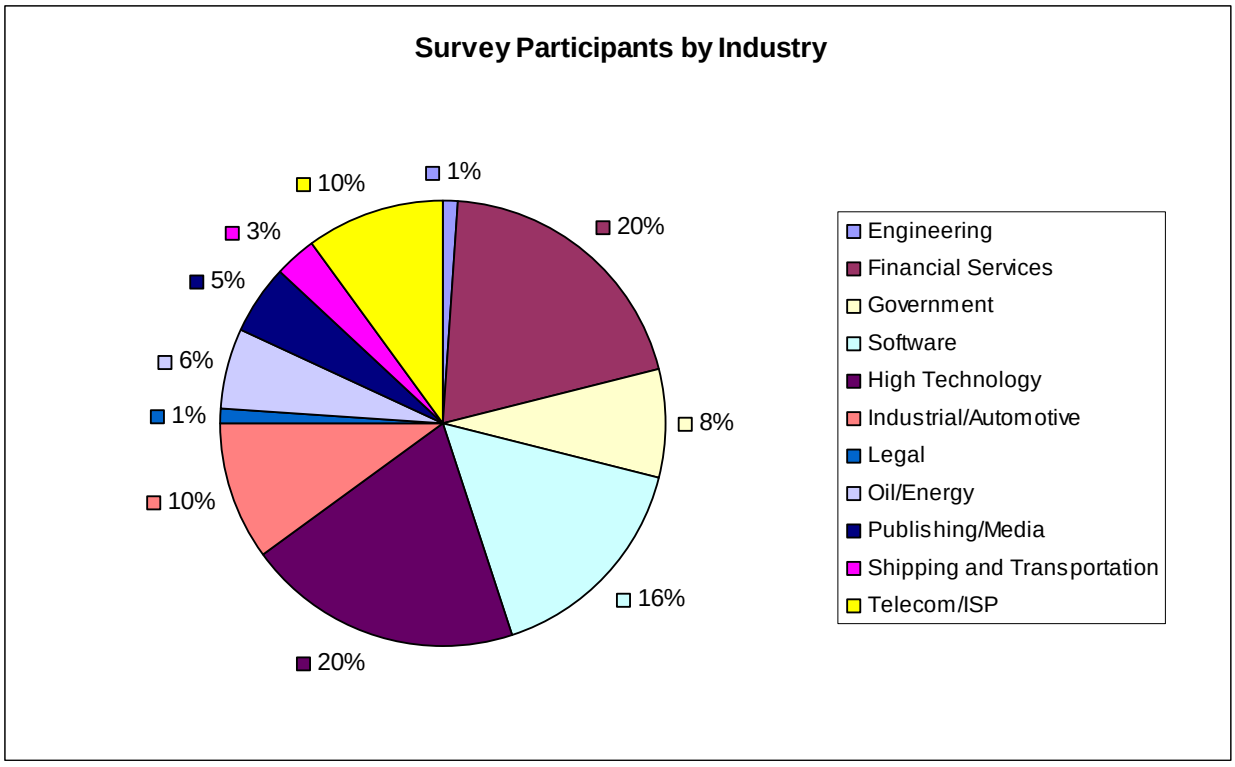

Figure 1. Survey Participants by Industry Category

Roughly 90% of participating companies were based in the US and 10% were based in Europe while 10% of all participating companies operated worldwide. There was no minimum number of employees for survey participation and a significant number of smaller companies (mainly legal firms, engineering firms and software companies) participated. The largest companies

participating in the survey were in the financial services, industrial and automotive, and oil and energy categories. The average number of employees of companies participating in the survey was approximately 10,500 employees. The largest company participating in the survey reported having 125,000 employees while the smallest reported having 20 employees (see Figure 2).

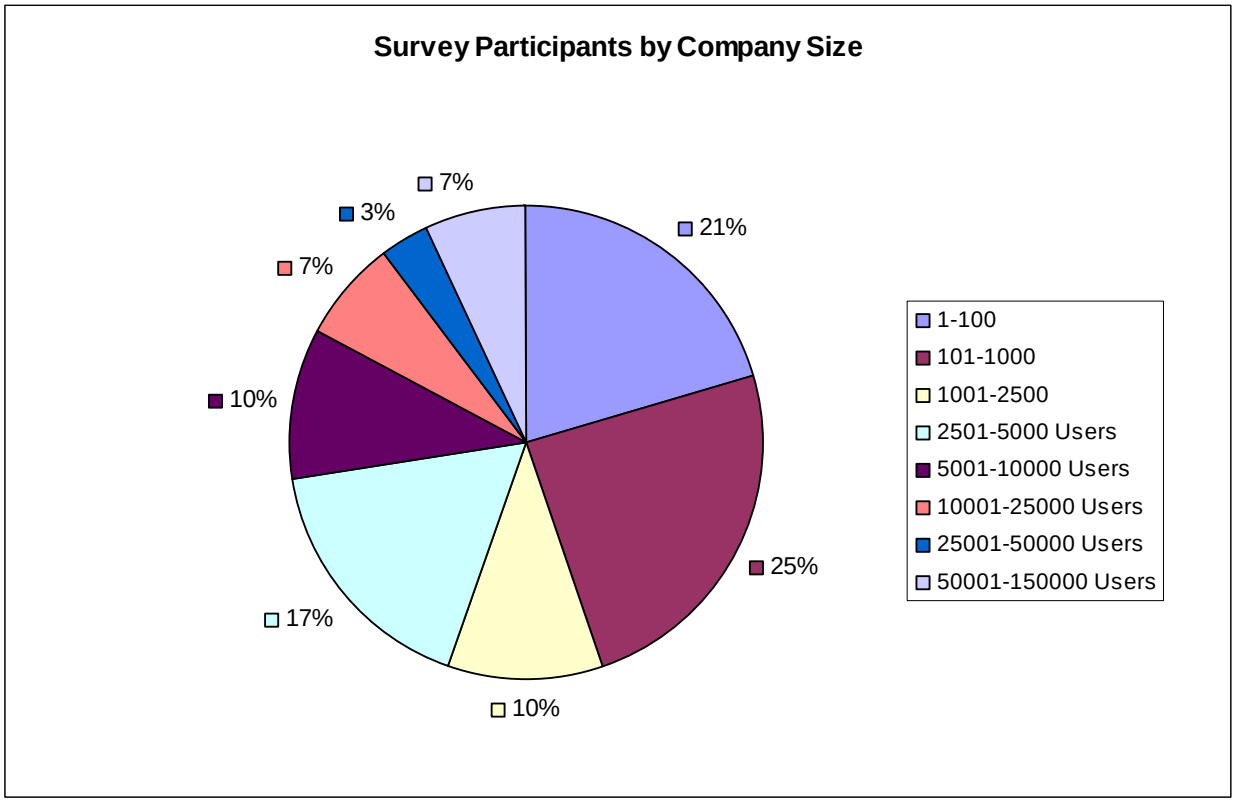

Figure 2. Survey Participants by Company Size

The average number of office locations per company was 234 with an average of 45 employees per facility. The latter number was influenced by the participation of smaller entities in the survey as well as by the relatively large number of local offices in the financial services industry as well as by global companies with numerous relatively small offices around the world. The average number of data centers per company was 21 with an average of 500 employees per data center. For the purposes of the survey a data center is any site with one or more servers. The average number of employees per data center reflects a mixture of smaller companies with very low numbers of employees per data center, and distributed servers within larger companies where servers were placed in regional or international offices. Despite the averages, the larger companies participating in the survey invariably operated a small number of large data centers servicing thousands of users per data center.

Top Ten IT Priorities in 2004

Disaster recovery, cost reduction, server consolidation, and security remain among the top ten IT priorities as they were in 2003. Issues perceived as having been previously resolved or low priority appear to have re-emerged as top ten priorities in 2004. Specifically, anti-spam and anti-virus solutions, which were not in the top ten in 2003, were primary IT objectives in 2004 (see Table 1). Mobile and wireless technologies have been consistently noted as a priority but companies continue to invest conservatively on this category (see Wireless below). A listing of the top 25 IT priorities can be found in Appendix A.

Rank	IT Objective
1	Disaster recovery
2	Cost reduction
3	Collaboration and knowledge management
4	Security solutions
5	E-mail upgrade and migration
6	Anti-spam solutions
7	Anti-virus solutions
8	Server or application consolidation
9	Directory services, metadirectories, identity management
10	Wireless messaging and applications

Table 1. Top Ten IT Priorities in 2004

IT priorities in 2004 reflect ongoing projects aimed at standardization, consolidation (e.g., NT Domain to Microsoft Active Directory migrations, e-mail upgrades, etc.), and overall cost reduction. There is significant new technology adoption taking place, but on a limited scale, e.g., new applications may be deployed only to a small group of users. Spending in different areas of technology seems to be driven by disparate factors rather than by focused enterprise strategies. Sarbanes-Oxley compliance and the threat of global terrorism have resulted in spending in e-mail archiving and content filtering and in disaster recovery planning. The overall budget picture is a tactical, rather than a strategic one, and most of the top ten IT priorities in 2004 have been reactive.

1. Disaster Recovery and Business Continuity

The survey did not specifically ask about disaster recovery or business continuity planning, but it is not surprising to find that disaster recovery planning has been the number one priority of IT organizations in 2004. The high priority of DRP indicates that it has taken precedence over other issues. At the same time, vendors offering DRP products and services, e.g., SunGuard, IronMountain and other vendors, have been very active during the past year.

2. Cost Reduction and Operational IT Outsourcing

The majority of IT cost reductions have come from cutting operational IT staff and new technology investments. Outsourcing ranked twenty third among IT priorities, but a staggering 77% of companies indicated that they planned to outsource aspects of IT ranging from software development to IT operations. At the same time, 57% of companies indicated that they do not have adequate staff for ongoing operations and 73% indicated that they do not have an adequate budget for ongoing operations. Despite the apparent lack of operational resources, less than half (47%) have plans to hire additional IT workers. The data indicate that operational components of IT organizations are resource starved while the emerging strategy is to

outsource IT operations. In sharp contrast with the outsourcing trend, companies remain willing to allocate staffing and funding resources to new IT projects. For new technology initiatives, 63% of companies indicated that they have adequate staff for currently planned projects, although only 43% indicated that they had adequate budgets to carry out new projects. Paradoxically, it appears to be more feasible for IT management to obtain funds for new technology initiatives than to increase operational resources for existing solutions.

Although the survey did not ask about customer satisfaction with outsourcing, anecdotal evidence suggests that outsourcing vendors are highly effective in operational areas (e.g., system administration, PC and LAN support, helpdesk, etc.), but that they are consistently weak in carrying out new IT projects. One possible reason for this qualitative difference is that outsourcing vendors do not know the organizations along with their requirements, protocols, procedures and stakeholders as well as in-house IT staff. Outsourcing vendors are apparently suffering from a general lack of consulting expertise needed to develop the organizational knowledge required to successfully carry out new IT projects.

3. Collaborative Computing/Groupware

There appears to be significant renewed interest in collaboration and knowledge management (see Groupware below).

4. Security Solutions

The survey did not specifically ask about security solutions outside of e-mail and messaging security, but security concerns have certainly been a top priority in 2004. Most IT organizations have focused on network security including traditional firewalls, intrusion detection, etc., as well as on improving and managing anti-virus solutions. However, new security initiatives have been based on relatively new technologies such as SSL VPN solutions offered by F5 Networks, Juniper Networks and other networking companies. Since most security attacks currently target the Windows platform, it is worth noting that Microsoft initiated a broad security initiative in 2004, the first fruit of which was Windows XP Service Pack 2 (a collection of security patches and new features that plugs security holes in Windows XP). Perhaps the most interesting new technology introduced in Windows XP SP2 was Data Execution Protection (DEP) which eliminates buffer overrun exploits (a common method of attack). Although a full discussion of security technologies is beyond the scope of the survey, security is likely to remain among the top five IT priorities for years to come.

5. E-mail Upgrade and Migration

As discussed in detail below e-mail migration and upgrade activity has continued at a steady pace with customers generally moving to newer versions within the same product family. Notably absent from the top IT priorities reported by companies participating in the survey were e-mail archiving and attachment management as well as unified messaging (see E-mail and Messaging below).

6. Anti-spam Solutions

Adoption of e-mail anti-spam solutions has greatly accelerated, evidently in response to the deluge of junk e-mail choking Internet service providers and corporate e-mail relays. The total volume of spam currently exceeds legitimate e-mail and far exceeds the total volume of business e-mail traversing the Internet. The year 2004 can perhaps be remembered as the Year of Spam, marked not only by the rising tide of junk e-mail but also by the apparent ineffectiveness of the US CAN-SPAM legislation passed in December of 2003 (see E-mail and Messaging below).

7. Anti-virus Solutions

Over time a growing number of vulnerabilities, mainly in Microsoft operating systems and other Microsoft software products, have been exposed by hackers and security firms. In particular, the Windows OS itself, the Internet Explorer browser, and the Microsoft Outlook e-mail client have been targeted by a mixture of viruses, worms, Trojans, adware and spyware, and by increasingly virulent combinations of these technologies. IT organizations remain on the front lines struggling to keep private networks running smoothly regardless of the hailstorm of Internet-borne threats just outside their firewalls. Anti-virus vendors have made incremental improvements in their products but IT organizations have universally adopted a multi-tier approach, typically involving multiple vendors (Symantec, Network Associates, Sophos, Trend Micro, etc.) blocking viruses at the e-mail gateway, on servers, and at the desktop. A full discussion of anti-virus technology is beyond the scope of the survey; but anti-spam vendors are discussed in the context of anti-spam solutions (see Anti-virus Vendors and Anti-spam below).

8. Server Consolidation

While companies have sought to reduce the number of servers and have indeed consolidated many servers and services to relatively fewer physical computer systems, they have at the same time continued to deploy new servers resulting in a net increase in the total number of servers (see Server Operating Systems below). At the same time, storage consolidation using SAN technology has gained greater acceptance.

9. Directory Services

The directory services area is marked by two significant trends: migration to Microsoft Active Directory and adoption of identity management (see Directory Services below).

10. Wireless Messaging and Applications

The makeup of the wireless landscape is changing with the major players (RIM, Palm and, indirectly, Microsoft) squaring off in head-to-head competition for the enterprise wireless e-mail market (see Wireless below).

Trends in New Technology Adoption

The overall picture that has emerged in 2004 can be described as a conservative one where the majority of IT organizations remain focused on tactical rather than strategic considerations. Despite relatively low levels of new IT investment, there are strong currents of new technology adoption in Linux, instant messaging and wireless, although on a limited scale. New technology adoption is taking place against a backdrop of ongoing and aggressive cost cutting measures such as outsourcing. While companies have forged ahead with new technologies in limited deployments they have simultaneously cut budgets in other areas.

Server Operating Systems

Windows is the most commonly deployed server operating system with approximately 69% of companies running Windows as a part of their core IT infrastructure. In contrast roughly 20% of companies reported using UNIX or Linux (see Figure 3).

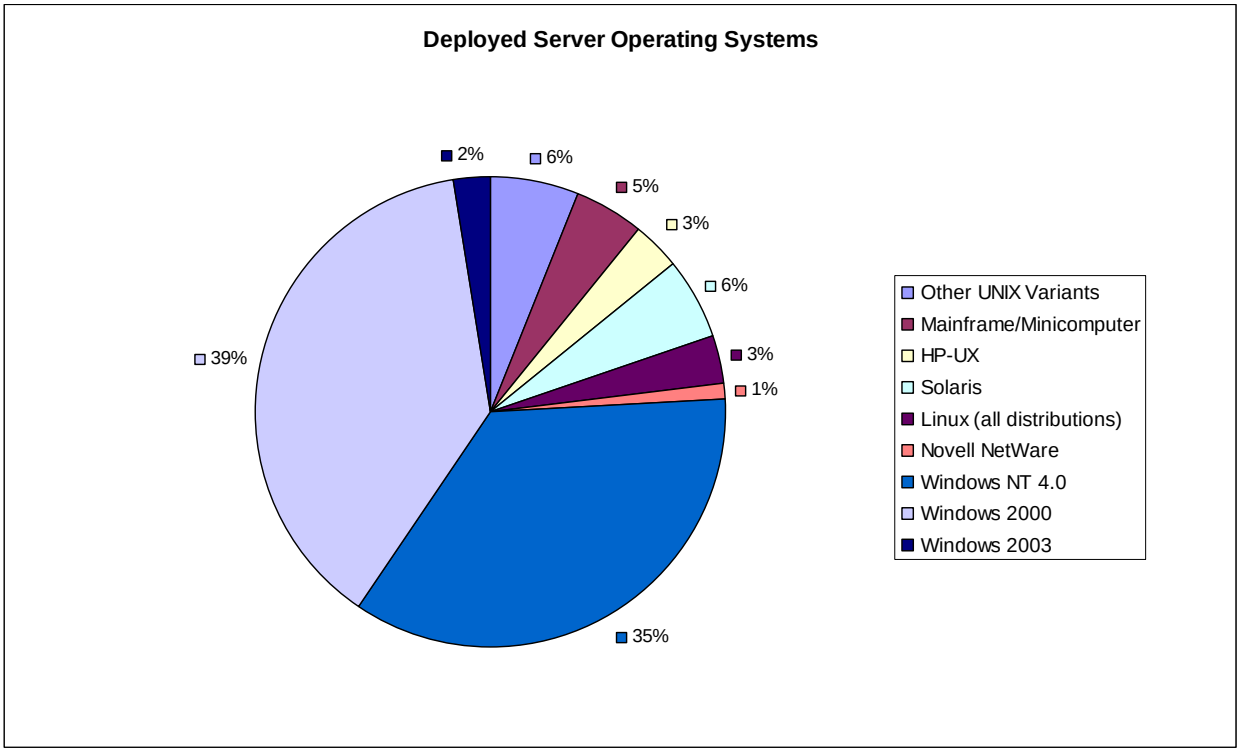

Figure 3. Use of Server Operating Systems

Windows Servers

Most of the companies participating in the survey that are running Windows had not yet completed migrations from Windows NT to Windows 2000 although over half are in the process of migrating from and consolidating servers running earlier versions of Windows. Over half of IT customers are migrating or upgrading Windows servers (from Windows NT and 2000) with the majority of planned future upgrades targeting Windows 2003 (see Table 2).

Server OS	Overall % of Servers	% of Windows Servers
Windows NT 4.0	31.87%	46.40%
Windows 2000	34.63%	50.42%
Windows 2003	2.18%	3.18%

Table 2. Microsoft Server Operating System Deployments

UNIX and Linux

Although roughly 20% of enterprises run UNIX or Linux (see Table 3) the survey did not include Internet service providers (ISPs) or application service providers (ASPs), which overwhelmingly rely on UNIX and Linux. Despite the fact that Windows servers have proliferated in the past few years there has been no apparent reduction in the number of UNIX servers deployed and the overall number of UNIX and Linux servers is certainly increasing. There is no indication of any

statistically significant shift in the use of UNIX or Linux relative to Windows. What is more important is that Linux deployments have increased dramatically relative to mainstream UNIX variants: Solaris, HP-UX, and AIX.

Server OS	Overall % of Servers	% of UNIX/Linux Servers
Solaris	5.02%	24.93%
IBM AIX	3.83%	18.96%
HP-UX	2.99%	14.80%
Linux (all distributions)	2.93%	14.49%
Other UNIX variants	5.42%	26.80%

Table 3. UNIX Server Operating System Deployments

Less than 3% of all companies are running production Linux servers, but the proportion of Linux to other UNIX variants appears to have grown dramatically to 14.5% of all UNIX servers. There has been a sharp increase in adoption of Linux servers, at least doubling the number of production Linux servers compared with 2003. At the current rate of adoption Linux could account for over half of all UNIX servers in approximately three years.

Linux Servers in the Enterprise

The vast majority of Linux servers continue to be used in the context of DMZ applications such as outward facing web applications (including associated application servers and open source database servers) and Internet e-mail servers. Among IT customers relying on Windows servers on their internal networks there is no indication of Linux adoption for core IT or intranet applications over Windows. Companies running a mixture of servers internally, in particular those running UNIX servers indicated increased willingness to deploy Linux servers internally for core IT and intranet applications. A total of 37% of companies indicated that they were considering or willing to consider Linux as a core server platform potentially replacing both UNIX and Windows servers. This bodes well for Novell (see Novell Linux Strategy below) since many Novell customers run a mixture of different servers. The data also suggest that Linux servers are already replacing low-end UNIX servers both in the DMZ and on internal networks.

Companies running UNIX systems today do not perceive significant barriers to Linux adoption and indicate that they have adequate IT staff expertise (approximately 17% of companies indicated that they currently have UNIX/Linux expertise within their staff), and they have not indicated any concerns regarding (a) vendor support, (b) quality of open source software, or (c) legal disputes over Linux and UNIX. The apparently complete absence of these concerns over Linux among IT customers suggests that their wide coverage by the technology industry news media does not reflect reality. Evidently, companies will adopt or not adopt Linux based on traditional and pragmatic IT considerations. Certainly, this will at least create price pressure on Microsoft if not eventually erode their server market share.

Linux on the Desktop

Although the survey did not specifically cover desktop operating systems there has been much discussion of Linux on the desktop. The survey data indicate a handful of engineering-centric desktop Linux deployments. No companies participating in the survey indicated plans to deploy Linux desktops. While it is easy to imagine a mixture of browser based applications and MIT X Window System applications running on low-cost Linux workstations, companies currently using Microsoft Windows on the desktop indicated no plans to migrate at this time. Linux desktop environments such as Gnome, KDE and Sun's Java Desktop System as well as desktop applications such as OpenOffice and Sun's StarOffice have reached the point of viability from a

technical standpoint. A full discussion of potential migration away from Windows is beyond the scope of the survey.

Sun Microsystems Solaris and Linux Strategies

Despite the fact that Sun has not recently gained market share, the company remains the market leader for mid-range UNIX servers compared with HP Compaq and IBM. Solaris 10 will move Sun's SPARC architecture servers up market by introducing a number of new technologies that provide mainframe-like capabilities in key areas such as scalability, workload management, and interchangeability of components. At the same time Sun is building out its N1 Grid data center management solution.

Sun's launch of a new line of Linux servers and workstations (July, 2004) indicates Sun's intent to contend for low-end servers and workstations with Linux because the company can no longer compete with Intel hardware with their more costly SPARC processor technology. Arguably, Sun has correctly predicted the future impact of Linux on the UNIX server market. Sun supports SuSe and Red Hat Linux on its AMD processor based systems as well as Solaris x86 including Solaris 10. On the low end Sun has introduced Java Desktop System aimed primarily at Linux desktops and has also added support for the Gnome v3.0 desktop system to Solaris 10. It seems likely that Sun's moves on the low end (AMD/Linux and Solaris x86) are speculative, i.e., the rising tide of Linux and Intel-based servers may lift Sun's ship along with others. Sun's core strategy appears to be moving up market with Solaris 10 and high-end SPARC architecture servers competing more aggressively with HP Compaq and IBM.

Sun Server Software Strategy

Sun has repositioned its server software offerings (formerly iPlanet and Sun ONE server products) under the label Java Enterprise System (JES). Despite the fact that the JES-branded products are not written in Java, Sun's new marketing and pricing combined with tighter integration of the products (which include a messaging server, directory server, calendar server, application server, and other products) is promising. Since the Sun/Netscape alliance with AOL (which coincided with the iPlanet brand) came to an end, Sun has made little progress in the market with its software products. Software products aimed at large enterprises and service providers have been a secondary priority for Sun.

Novell NetWare

Novell accounts for less than 2% of all currently deployed servers when counting web servers, database servers, application servers, etc., but Novell continues to hold a far larger share of traditional network operating system infrastructure: between 10% and 15% of NOS infrastructure (i.e., file and print services). Servers running Microsoft operating systems or UNIX/Linux are used in a variety of ways (including file and print services and directory services) including applications, e.g., database and web servers, while NetWare servers have remained in the NOS niche since the 1980's. This resulted mainly from the difficulty of attracting developers to the NetWare platform compared to the popularity enjoyed by Windows and UNIX among software developers. At the same time, the fact that NetWare Directory Services (NDS) has not been able to compete with Microsoft Active Directory results substantially from the level of desktop integration and control as well as integration with Microsoft server applications offered by AD (see Directory Services below).

Novell Linux Strategy

Novell's repeated forays into the realm of Intel based UNIX over the past decade have all been attempts to expand the company's offerings outside of the NOS category and to establish Novell

as a player in the client/server application area (e.g., web, database, messaging, etc.). Although the company has simultaneously embraced Internet based standards, Novell has historically been unable to enter new markets where mainstream UNIX variants and Windows have generated stiff competition. Novell was simply too early in attempting to compete with established UNIX vendors, and with Windows, based on an Intel port of the UNIX operating system. At the time Novell was hampered by past hardware limitations of Intel-based servers and by a relative lack of developer support. Novell's developer support problem has certainly now been solved through open source software. With tremendous improvements in hardware, growing acceptance of Linux, rapid expansion of Linux based software, and a growing Linux developer community, Novell's vision can finally be realized. Novell's acquisition of SuSe Linux shows that, while the company can no longer compete in the network operating system category, Novell fully intends to expand beyond the NOS category through Linux. It remains to be seen if the company has the ability to become a leader in the Linux arena but Novell's current strategy is clearly the best way forward for the company.

Other Server Operating Systems

Companies participating in the survey reported that roughly 11% of servers run a mixture of Mainframe and legacy operating systems. No change is apparent compared to recent years, suggesting that existing mainframe and minicomputer systems continue to be used without either increased adoption or migration away from these platforms. It is worth noting that a single year-to-year comparison is unlikely to detect a trend in the mainframe area. The survey did not explore the use of mainframe systems in detail or look at multi-year trends.

Server Consolidation Trend

Server consolidation remains a high priority for IT organizations, but the total number of servers deployed has continued to increase. Consolidation related technologies, specifically blade servers and data center management technologies are apparently being quickly adopted. There is a clear discrepancy between the reported priority of server consolidation and the reality of continued server proliferation. This gap probably indicates the relatively high cost of server consolidation technologies compared with adding less expensive servers to meet tactical needs. At the same time, the current focus on redundancy and disaster recovery (the number one IT priority in 2004) inherently increases the total number of servers despite consolidation efforts.

No companies participating in the survey reported a net reduction in the total number of servers they operate across all applications and services. A more realistic picture could be obtained by evaluating the number of applications and services delivered by the IT infrastructure versus the number of discrete servers. In the latter assessment one would expect to find an improving ratio of applications and services to physical servers regardless of the actual number of servers, which at present continues to increase in spite of consolidation efforts.

E-mail and Messaging

The makeup of the enterprise messaging server landscape has continued to change in favor of Microsoft, which now appears to hold 53% of all enterprise messaging server deployments. Lotus Domino deployments among US companies appear to have declined slightly holding roughly 24% of the US market. Deployments of UNIX-based messaging servers appear to have risen slightly. No companies participating in the survey used Novell GroupWise (see Figure 4).

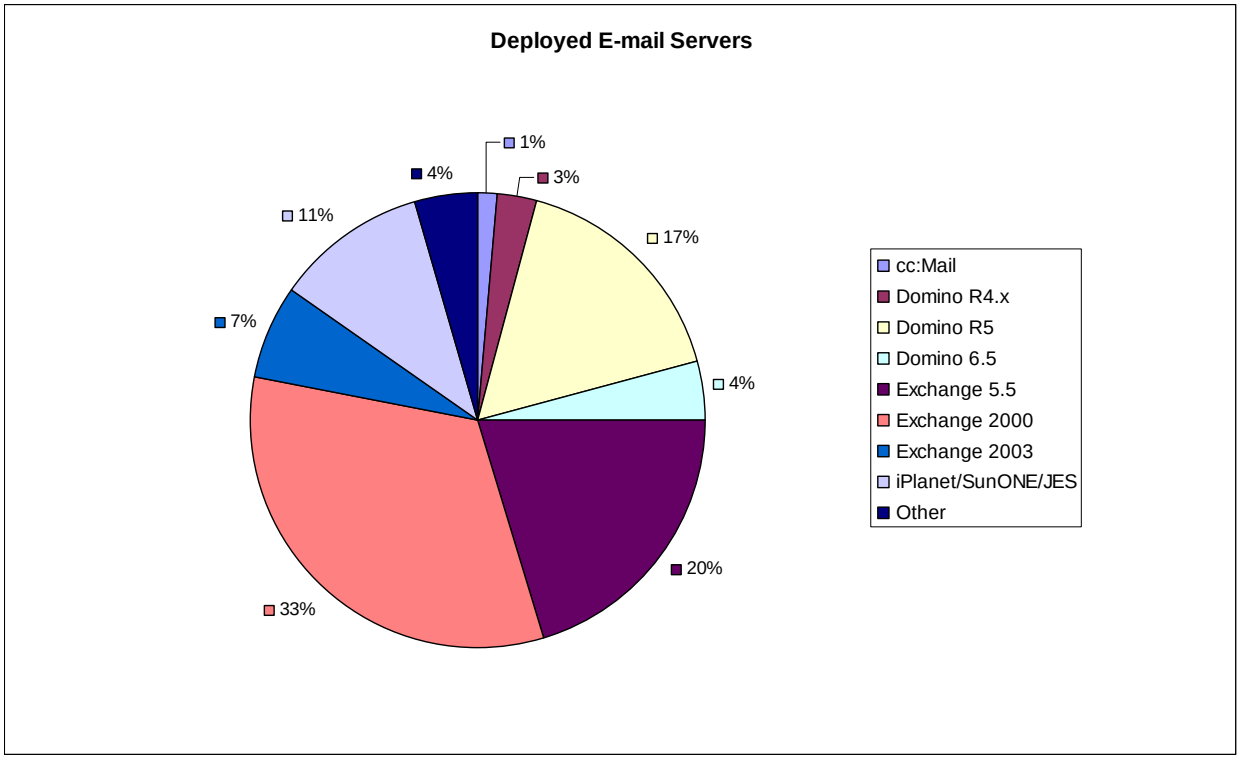

Figure 4. Use of Messaging Servers

Most companies are upgrading or planning to upgrade to current versions of the products that they are already using, e.g., Exchange customers are generally upgrading to Exchange 2000 and 2003 while Domino customers are generally upgrading to Domino 6.5. Switching vendors or products, a common event in the late 1990's, is rare at the present time. Notably absent from the mix of e-mail servers reported by companies participating in the survey were Oracle, BT Syntegra, Samsung Contact, and numerous smaller e-mail server companies.

Microsoft Exchange

Of Microsoft Exchange customers, less than half continue to use Exchange 5.5 while Exchange 2000 upgrade and migration activity has progressed steadily (see Table 4). Some Exchange customers plan to upgrade directly from Exchange 5.5 to Exchange 2003.

MS Exchange Version	% of Deployments
Exchange 5.5	34.11%
Exchange 2000	54.79%
Exchange 2003	11.10%

Table 4. MS Exchange Deployments by Version

The Exchange server product has evolved through successive software architectures from the initial releases from Exchange 4.0 and Exchange 5.x, to Exchange 2000 and Exchange 2003. With each major revision Microsoft has made significant architectural changes. There is an apparent acceleration of upgrade activity moving from Exchange 5.5 to newer versions of Exchange and the majority of IT customers remain committed to Microsoft's e-mail strategy. The apparent acceleration in upgrade activity can be attributed in part to the success of Microsoft's Active Directory technology. With over 50% of Windows servers running Windows 2000 and above (and using AD), moving to the latest version of Exchange is more feasible at present than previously.

IBM Lotus Domino

While the majority of IBM Lotus Domino customers have elected to upgrade existing Domino systems rather than migrating, IBM Lotus has not made progress in migrating Exchange 5.5 customers to the Domino platform. Unlike Microsoft, which has yet to move roughly half of Exchange 5.5 customers to newer versions, IBM Lotus succeeded in moving Domino customers to Domino R5 and is currently making rapid progress moving its customers to Domino 6.5 (see Table 5).

IBM Lotus Domino Version	% of Deployments
Domino R4.x	**11.90%**
Domino R5	**71.09%**
Domino 6.0/6.5	**17.01%**

Table 5. IBM Lotus Domino Deployments by Version

Roughly 17% of Domino customers are running Domino 6.5 compared with 11% of Exchange customers running Exchange 2003 while a third of Microsoft Exchange customers remain on Exchange 5.5. The different rates of migration to newer versions can be attributed to Lotus' consistent architecture and flexible upgrade path (both clients and servers are interoperable and downward compatible) compared to Microsoft's changing product architectures, particularly the dependency of new versions of Exchange on AD.

Sun Java Enterprise System Messaging Server

Given that Sun is not widely recognized as an enterprise e-mail software vendor compared with corporate e-mail heavyweights Microsoft and IBM Lotus, a remarkable number of companies (approximately 11%) reported using Sun messaging solutions. The percentage of companies using Sun messaging reflects a combination of the sendmail message transfer agent (MTA) running on Solaris, e.g., Internet mail relay hosts, and Sun's Java Enterprise System (JES) Messaging Server (formerly both the Sun Internet Mail Server or SIMS and also the Netscape/iPlanet/Sun ONE Messaging Server). The majority of Sun messaging customers are ISPs and telecom companies, but Sun must be counted as an enterprise e-mail server vendor.

Open Source Messaging Servers

No companies indicated that they are using an open source messaging server, e.g., the Cyrus and UW IMAP servers or other e-mail servers available with various Linux distributions. On the one hand, a significant number of companies are willing to consider Linux servers in the enterprise (37%) and various open source messaging servers (standards-based SMTP, POP3 and IMAP4 servers) ship with popular Linux distributions. On the other hand, it seems that messaging, which is a mission-critical business application, is an area where companies require a high degree of vendor support and are unwilling to run unsupported software. There is clearly

an opportunity for Linux-based commercial messaging software. Contenders for this market opportunity potentially include Sun (following a standards-based approach) and SCALIX, which offers a Microsoft Exchange compatible messaging server on the Linux platform. Of course neither of these companies' products are open source software.

Deployed E-mail Client Applications

Various versions of Microsoft Outlook currently account for approximately 65% of all desktop e-mail clients with Outlook 2000 accounting for roughly 50% of all e-mail client applications (see Figure 6). Lotus Notes clients account for roughly 24% of desktop e-mail clients with the majority of these being Lotus Notes R5. Lotus Notes client deployments correspond very closely to IBM Lotus Domino server deployments whereas Outlook e-mail client deployments exceed Microsoft Exchange server deployments. As with e-mail servers companies are upgrading or planning to upgrade e-mail client applications within the same vendor and product line; moving to current releases of products such as Outlook and Lotus Notes.

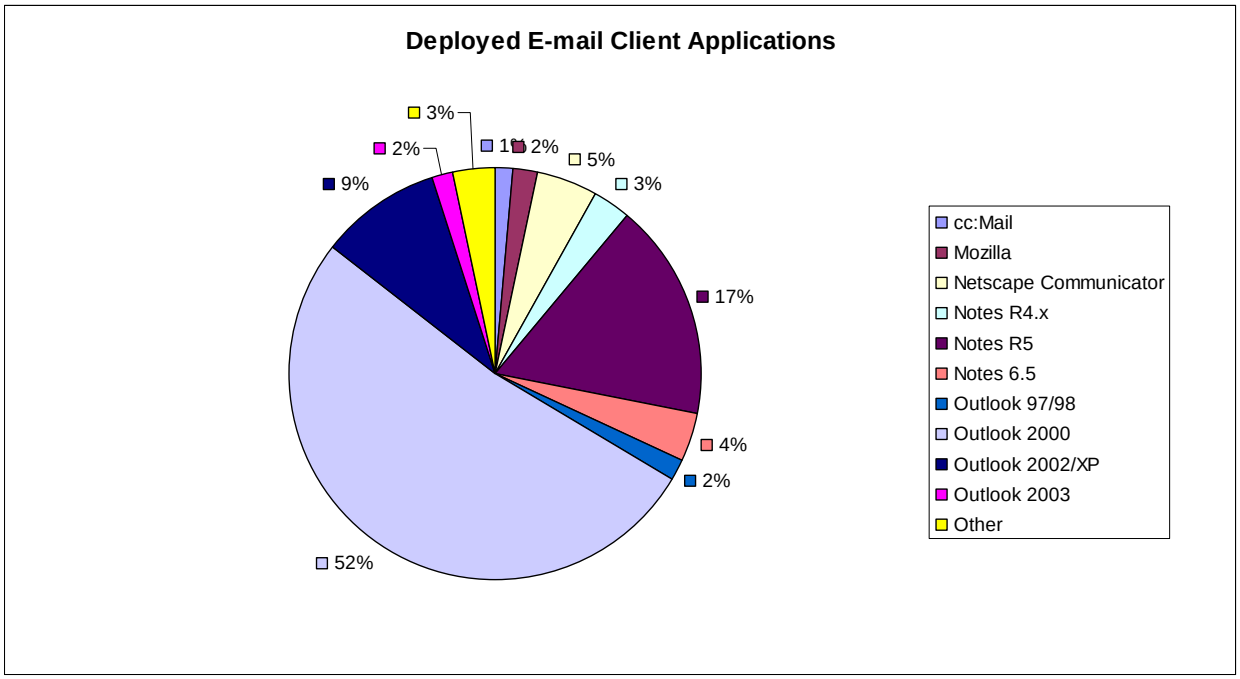

Figure 5. Use of E-mail Client Applications

The dominance of Outlook on the desktop underscores the potential for lower cost Exchange compatible messaging server products running on Linux. While the Outlook client supports open Internet-based standards, the full functionality of the product is reserved for Microsoft Exchange. Messaging server vendors, including IBM Lotus, are coming to terms with the reality of Outlook on the desktop while Linux based groupware clients like Evolution must solve the opposite problem: Exchange on the server side. Client-side Outlook integration with non-Microsoft messaging servers is not a mature solution compared to a single vendor both on the server side and on the client side.

Adoption of Anti-spam Solutions

Anti-spam solutions have grown quickly from a niche application to a major enterprise software category including a number of new software companies and service providers (see Figure 5).

While new anti-spam products and services are being quickly adopted, over time companies have generally taken one of four basic approaches to the growing spam problem:

1. Buy current (third generation) anti-spam technology
2. Use a hosted anti-spam service (e.g., Postini, eDoxs, etc.)
3. Build an anti-spam solution in-house (e.g., using open source software, RBLs, etc.)
4. Use basic (first generation) e-mail filters built into e-mail servers and anti-virus software

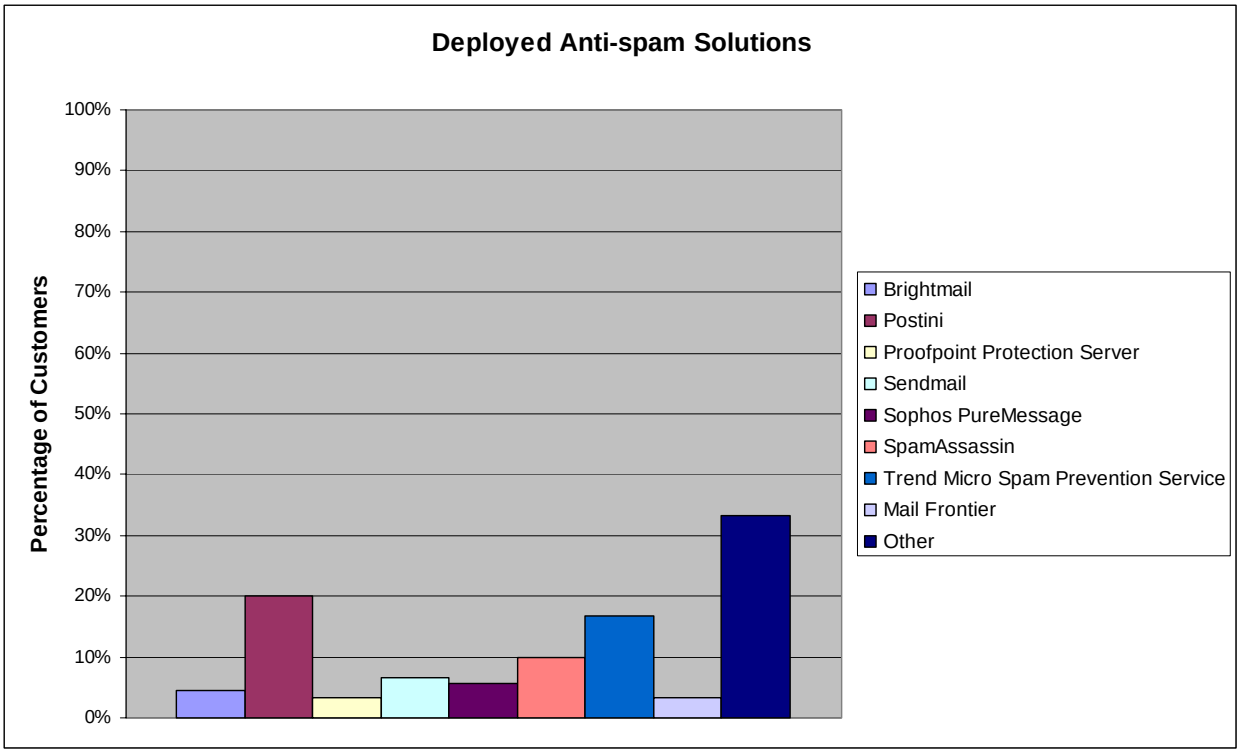

Figure 6. Use of Anti-spam Solutions

There remains no clear leader in the anti-spam software category (see Figure 5) and several significant anti-spam companies, such as CipherTrust, were cited by less than 1% of companies participating in the survey (and are not shown in Figure 5). One third of companies participating in the survey indicated that they were using a solution that accounted for less than 1% of all anti-spam solutions (the 'Other' category shown in Figure 5), thus numerous second and third tier products and services appear to have a foothold in the marketplace.

Hosted Anti-spam Services

Postini appears to have emerged as the dominant provider of hosted anti-spam services with approximately 20% of companies indicating that they are using Postini's services. The percentage of companies participating in the survey that are using Postini reflects the numerically larger number of smaller companies, which are more likely to use a service provider than to use an enterprise software product. Postini enjoys the advantage of not using store and forward technology, thus Postini does not take ownership of customer data but only processes inbound and outbound e-mail connections.

Anti-virus Vendors and Anti-spam

Although anti-virus heavyweights Sophos, Trend Micro and Symantec are among the leading anti-spam companies, leaders in e-mail anti-virus solutions (which also include Network Associates) have yet to enjoy corresponding success in the anti-spam category. Despite the fact that most IT customers would probably prefer an integrated e-mail protection solution, anti-virus vendors have not been able to dominate the anti-spam market because they have simply not been able to offer the best solutions in the past. Recent acquisitions have changed that situation, including the Trend Micro's licensing of the Postini anti-spam engine (March, 2003), the Sophos acquisition of ActiveState (September 2003), and the Symantec acquisition of Brightmail (May, 2004). Of the major anti-virus vendors, Sophos appears to have garnered the greatest market share. Every major anti-virus vendor has announced significant customer wins but none of them have a majority market share overall.

Messaging System Vendors and Integrated Anti-spam

Enterprise messaging system vendors are also integrating anti-spam capabilities into their products, e.g., Sendmail's Mailstream Anti-spam Solution (announced November 2002), Microsoft's Exchange 2003 Intelligent Message Filter (announced November, 2003), and Sun's initiative to integrate Sophos PureMessage with the Sun Java Enterprise System Messaging Server (announced April, 2004). Historically, integrated anti-spam features of message transfer agents (MTAs), such as whitelists, blacklists, and DNS-based Real-time Blacklists (RBLs), have been weak both in terms of technology and in terms of real-world results. Sun, for example, inherited one of the first significant anti-spam technologies from Netscape (the Unsolicited Bulk E-mail or UBE filter of the Netscape/iPlanet Messaging Server) but eventually realized that a new technology approach would be required as spammers became increasingly sophisticated over time. IBM Lotus provides excellent anti-relay functionality and basic MTA controls in the Domino server product that can be used to stop spam, but these capabilities are simply inadequate in the face of the current spam problem. Short of integrating independently established anti-spam solutions, as Sun has done, it seems unlikely that messaging system vendors will provide adequate anti-spam solutions. One possible exception is Sendmail because its anti-spam solution is based on a new, third-generation technology that the company acquired. Unlike the anti-spam software startups, Sendmail is an established messaging infrastructure supplier linked both to the world's most commonly used MTA (sendmail) and to open source software.

Emerging Anti-spam Technologies

New technology standards that interoperate across MTAs from different vendors, such as the Microsoft-backed Sender ID standard, will eventually help to stem the rising tide of spam. A simple but powerful concept, Sender ID guarantees that messages have in fact originated from the Internet domains indicated by the e-mail servers sending them. The technology promises to dramatically reduce Internet-based fraud, such as so-called 'phishing' scams. Sender ID incorporates Microsoft's Caller ID for Email technology and the Sender Policy Framework developed by Meng Weng Wong (Chief Technology Officer at Pobox.com). However, the length of time before new standards like Sender ID are widely deployed and the actual impact they will have on the overall spam problem are difficult to estimate. Certainly, the anti-spam solution marketplace will remain viable for the next three years and perhaps indefinitely.

Anti-spam Software Startups

Startup software companies offering more effective third generation anti-spam technologies, such as Proofpoint, MessageLabs and other startups, are carving out significant market share.

What is more important, however, is that newer technologies are clearly driving the anti-spam market including the acquisitions made by anti-virus solution vendors.

Anti-spam Solution Effectiveness

Reported performance of anti-spam solutions varies widely depending on the approach. By far the best results, e.g., 95% and above spam detection rate, follow from the purchase of current anti-spam products such as Proofpoint Protection Server, Sophos PureMessage, and other cutting-edge products. Similarly the worst results, e.g., a 25% to 50% spam detection rate, follow from using first generation filters and in-house solutions. Reported results from hosted anti-spam services varied widely from 60% to 90% spam detection rates. The data clearly indicate that newer technologies are far more effective.

E-mail Security Trends

While anti-spam solutions entered the top ten IT priorities in 2004, e-mail security in general made little progress. Adoption of PKI technology remains low due primarily to high overall cost as well as inherent technical challenges of successful PKI deployments. Alternative technology approaches such as identity-based encryption (Voltage Security, Inc.) and policy-based e-mail management (Sigaba Data in Motion, Authentica and other software vendors) have not gained wide acceptance despite small numbers of high-profile deployments for each of the key companies in these categories. Roughly 25% of survey participants have deployed PKI technology, predominantly based on VeriSign and Entrust solutions. PKI deployments have been limited in scope, e.g., deployed only to select workgroups or employees. Roughly half of survey participants were aware of PKI and alternative technologies, but only 20% currently have plans to purchase additional products and services in the e-mail security category.

Regulatory Compliance and E-mail

The survey did not ask specifically about regulatory compliance, but compliance is a significant driver of e-mail security products and services. The vast majority of investment in compliance has gone primarily to archiving solutions and secondarily to content filtering rather than to security technologies such as PKI encryption. Briefly, technology cannot fully address regulatory compliance issues, such as HIPAA regulations in the health care industry or SEC and NASD regulations in the financial services industry, because it is as much a question of business processes and procedures as it is a question of technology. IT organizations can only address those aspects of compliance that are directly technological, such as e-mail and instant messaging. IT initiatives commonly stemming from regulatory requirements include e-mail and instant messaging archiving along with discovery (the ability to perform sophisticated searches of archives) and reporting capabilities. Solution vendors such as iLumin, Legato, and other vendors have focused squarely on compliance solutions.

E-mail Archiving

E-mail archiving is generally perceived as a straightforward product selection issue and has not been considered a high priority despite a great deal of activity in this area. Companies required by government regulations to archive e-mail (and instant messaging conversations) have been doing so for some time, thus renewed emphasis on regulatory compliance, e.g., resulting from the US Sarbanes-Oxley Act of 2002, has had a limited overall impact in terms of e-mail archiving. In connection to e-mail archiving (and e-mail systems themselves), IT customers have generally been more concerned about storage than about archiving. Although the survey did not explore trends in storage specifically, anecdotal evidence suggests a growing consolidation trend from distributed disk arrays to SAN technology.

E-mail Attachment and Storage Management

E-mail attachment management products such as IBM CommonStore and Legato EmailXtender are likely to gain increased acceptance since e-mail message and server message store sizes have continued to grow. Legato may be interesting as a vendor because of their acquisition of EMC, a leader in storage technology, in October of 2003. Although storage costs have fallen steadily, managing several terabytes of data is often impractical due to pragmatic considerations such as backup and restore time. Of course companies can impose quotas on e-mail users but most do not unless compelled for technical reasons to do so, e.g., limitations of storage or backup systems.

Instant Messaging

There was limited interest in Instant Messaging in 2003 on the part of enterprises, but IM gained far greater acceptance in 2004. Approximately 35% of companies are either deploying or planning to deploy IM solutions. At the same time over half (53%) of all companies currently seek to block or otherwise control IM activity, e.g., through IT policies. This situation suggests that users are adopting IM as a business tool regardless of support from their IT organizations. The type of IM solution used varies widely with no clear leader in terms of enterprise software or public IM services. Companies using Lotus Notes and Domino that deploy IM solutions tend to deploy Lotus Instant Messaging (formerly Sametime) substantially because of its tight integration with the Lotus Notes client, while companies using Microsoft Exchange are typically using or planning to deploy a Microsoft IM solution (Live Communication Server, formerly Exchange 2000 IM), which integrates with Active Directory and SharePoint servers, as well as with Outlook and Windows Messenger on the desktop. The vast majority of corporate IM use today derives from public IM services such as AOL rather than internally hosted IM servers.

For several reasons IM proxy servers (IM Logic, FaceTime, etc.) have been quickly adopted in certain industries, i.e., financial services and health care, and this class of products can be expected to grow in the future. Microsoft is in a good position to eventually control this market by tying its IM offering to Windows and Exchange. Certainly, this is one reason why AOL has withdrawn from the enterprise IM software market (June, 2004) effectively abandoning its technologically interesting federated authentication product and choosing instead to cooperate with IM proxy server vendor IM Logic.

Effective Business Use of IM

With the integration of IM into desktop e-mail/PIM client applications like Notes 6.5 and Outlook, as well as server-side integration with enterprise portals and similar applications, the facility to use IM will certainly become ubiquitous but perhaps not its actual use as a business application. Acceptance of IM by enterprises (and IT organization) depends not only on the ability of IT to control and support IM but also on its proper and effective use. IM is most beneficial when used in the context of workgroups or projects that are limited in scope as compared to use of IM as a general purpose tool like e-mail. The current situation indicates continued growth of enterprise IM use and adoption of new products in the IM category.

Some IT and business managers do not view IM as an enterprise application and they remain skeptical regarding the business benefits of IM. Specifically, critics cite the fact that most users of IM do not use it for business purposes and that IM simply distracts employees from focusing on their work. Critics also maintain that IM poses a security risk through features such as peer-to-peer file transfer, although enterprise IM products and other security products can block this functionality. Despite the potential for misuse, the effective use of IM as an enterprise application has been established and IM will undoubtedly continue to gain acceptance as a business tool. IM vendors cite presence awareness as the greater benefit of IM and presence

awareness, when properly used, certainly can accelerate business processes. Each organization must evaluate the appropriateness and benefits of IM based on their own user population and business processes.

Unified Messaging

Unified Messaging has been available for over a decade, but has yet to enjoy significant adoption. Among the key reasons is the fact that the added cost of UM over e-mail and voice mail is difficult for companies to justify. At the same time, fax technology, which is an established component of UM, has become less important than e-mail and newer communication technologies such as Internet based fax and Adobe's portable document format, not to mention instant messaging and wireless messaging. Wireless e-mail solutions independently provide seamless integration with desktop e-mail, thus UM offers no specific added value for wireless users. Hindering adoption of UM is a quickly evolving mix of communications technologies combined with the lack of a perceived need on the part of IT customers.

Wireless

The wireless landscape is changing quickly and adoption of wireless devices and related software on the part of enterprises has increased sharply. However, wireless e-mail; and mobile applications have limited scope in companies where they are deployed. While approximately 43% of companies are using wireless devices and software, wireless solutions have been deployed to only 12% of users within these companies. Additionally, only 20% of companies are using wireless applications although all are using wireless e-mail, which continues to be the key application of wireless.

Wireless E-mail Remains the Key Application

Wireless e-mail has been a category dominated by Research in Motion. In previous years RIM held the majority of the enterprise wireless e-mail market and RIM remains the market leader by a wide margin. Support of Palm OS and PocketPC devices on the part of IT organizations has increased substantially relative to RIM but RIM holds an overall market share of roughly 50% (see Figure 7). A significant development in 2004 is the increased ownership of Palm OS and PocketPC wireless solutions on the part of IT organizations (compared to individual users bringing unsupported devices into the organization), which indicates that these solutions have matured and therefore are now more competitive with RIM in the enterprise wireless e-mail category. It follows that IT organizations have assumed greater control over devices that had been previously used unofficially by individuals.

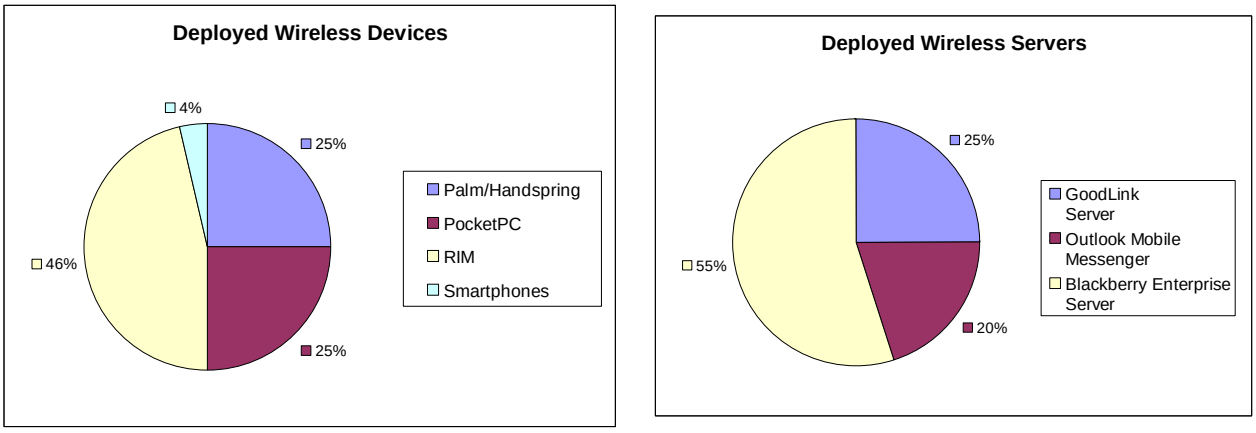

Figure 7. Use of Wireless Devices and Related Software

Wireless Server Software

Adoption of wireless server products follows development of new devices and Good Technology seems to be emerging as the server-side leader for Palm OS based wireless solutions compared with Microsoft for the server side of PocketPC solutions or RIM for Blackberry solutions. Good Technology seems to have made significant progress in transforming Palm OS devices into a solution that can compete with RIM, which is surprising for a company that does not control the device. Microsoft's combination of the PocketPC OS and mobile extensions to Exchange and Outlook (Microsoft has incorporated its Mobile Communications Server into Exchange 2003) is a serious threat to RIM and to Good Technology and Palm. It is worth mentioning that other wireless device vendors such as Danger Research (with its messaging oriented Hiptop device) have also taken aim at the enterprise e-mail market by focusing on Microsoft Outlook integration, obviously hoping to gain a foothold in the shadow of industry heavyweights: RIM, Palm, and Microsoft. Notably absent from the data on wireless servers reported by companies participating in the survey were Domino Everyplace from IBM Lotus and

JP Mobile's SureWave Enterprise Server. IT customers using IBM Lotus Notes and Domino have generally adopted RIM as their wireless e-mail solution. Since JP Mobile's traditional strength is in the wireless application category it is not a significant product in the wireless e-mail category, despite the product having a strong wireless e-mail feature.

Wireless Applications and 3G

Wireless devices in a business setting are viewed as communication tools and as extensions of the corporate desktop computing environment. E-mail is the key application and other mobile applications have not been widely adopted despite the fact that a number of products and services have been available. One major reason for low adoption of mobile applications has been the delay in deployment of 3G wireless data services by mobile operators. Another significant reason is the general failure of WAP technology and the so-called 'wireless web' as an enabler for wireless applications for enterprises. Currently, 2.5G GPRS services (AT&T, T-Mobile, and other mobile operators) and 3G services such as 1XRTT (Verizon) are available in major metropolitan areas and are being quickly expanded. Wireless e-mail vendors like RIM have moved to capture the emerging mobile application market. Clearly, established vendors of wireless e-mail servers are in the best position to expand from e-mail to a portfolio of wireless applications for enterprises. Indeed, RIM and other vendors have developed software and partnerships to deliver enterprise applications on wireless PDA devices and, for the foreseeable future, this is likely to remain the dominant paradigm.

Impact of WLAN/802.11 Technology

With more hotspots coming on line and with improving performance and range, WLAN technology is obviously a major feature of the overall wireless landscape. WLAN technology has been readily adopted and widely deployed, thus WLAN hotspots and home office wireless networks (combined with DSL or broadband Internet access) are replacing dial-up for notebook computer users. Due to inherent limitations in coverage compared with 3G, WLAN technology will not have a significant impact on the trend towards 3G wireless PDAs. WLAN is certainly the technology of choice for notebook computer users such as business travelers, e.g., due to the growing deployment of WLAN hotspots in airports and hotels.

Directory Services

The directory services category includes not only user-facing address books or white pages and back office authentication and access control, but also identity management and single sign-on as well as metadirectories. Unlike messaging, where companies tend to standardize on a single product, companies often use more than one directory service. Companies participating in the survey reported using different directories for file and print services and messaging, i.e., AD and NDS, versus applications where LDAP is the protocol of choice and where a mixture of LDAP directory servers are used in addition to AD and NDS.

Microsoft Active Directory

Approximately 37% of companies are using AD (roughly two thirds of all Microsoft customers) while another 19% are using NT Domains (roughly one third of all Microsoft customers), including those already migrating from NT Domains to AD. While 69% of companies are running some version of Windows as a server operating system, 56% of companies are using either NT Domains or Active Directory (see Figure 8).

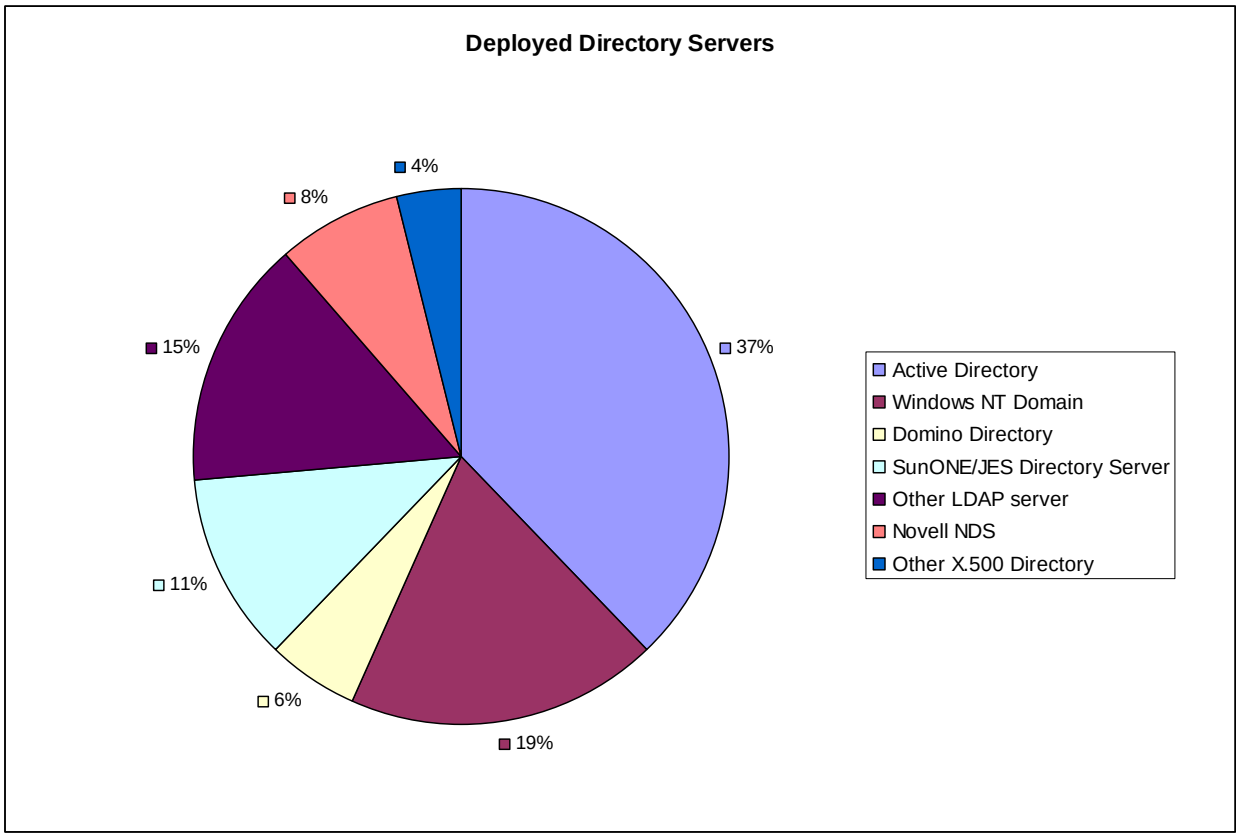

Figure 8. Use of Directory Services

Microsoft customers continue to move from NT Domains to AD and AD is currently replacing NT Domains more quickly than in the past. As is true for directory services in general, AD plays more than one role, e.g., network authentication, e-mail, support of Microsoft applications or applications based on Microsoft technologies, etc. In terms of (a) adoption on the part of enterprises, and (b) the diversity of the roles it plays, AD has emerged as a major heavyweight in the directory services arena.

NetWare Directory Services

Less than 2% of companies reported running Novell NetWare as a server OS platform (compared with 69% running Windows servers, and 20% running UNIX or Linux servers), but 13% of directory services are provided by NDS. Novell NetWare servers account for between 10% and 15% of NOS infrastructure (traditional file and print services) despite Novell's weak position in terms of the total number of deployed servers. Novell's NOS market share has declined in the face of competition from Microsoft and Novell is not in a position to win back directory services market share. Microsoft's tight integration of workstation OS's with AD and Microsoft administrative tools gives Microsoft a significant advantage. The combination of Microsoft Windows servers and AD provides a solution not only for NOS infrastructure, such as authentication and file and print services, but also for applications. Relatively few applications, e.g., database servers, run on NetWare. Historically, Novell has never solved the problem of attracting developers (and server applications) to the NetWare platform, whereas a large number of developers write software for Microsoft Windows server operating systems.

Domino Directory

While perhaps 20% of US companies use IBM Lotus Domino for messaging, only 10% (half of IBM Lotus Domino customers) use the Domino Directory as a directory service outside the scope of core Domino services such as e-mail. Domino Directory is not a significant contender in the directory services arena compared with AD or NDS even in Domino environments. Outside of existing Domino environments, it would not be intuitive to deploy Domino servers to address directory services requirements despite the fact that it is entirely possible to do so (Domino supports the LDAP protocol and sports an extensible X.500 based directory schema). Fundamentally, IBM Lotus has not positioned the Domino Directory as anything other than the native directory service of Notes and Domino which means that in most cases it is used almost exclusively as an e-mail directory.

Sun JES Directory Server and Other LDAP Servers

Approximately 26% of companies are using LDAP directory services other than AD, NDS, or Domino. Of these companies, roughly 43% are using Sun's Directory Server (formerly known as the Netscape, iPlanet, or SunONE Directory Server). The remaining 27% of LDAP directory server users are using a variety of directory servers ranging from the open source LDAP servers such as OpenLDAP to Aphelion LDAP, to IBM Directory Server (associated with WebSphere), and other LDAP server products. Other than Sun, however, there is no clear leader in the LDAP server category. Unlike AD and NDS, other LDAP servers are most often deployed to support applications, for example customer-facing or extranet web applications. Applications of this type frequently run on a Java application server platform, and therefore Sun is a natural choice. Sun offers web and application server products as well as a plethora of Java development tools and APIs in addition to their popular Java Virtual Machine and related SDKs. Sun's deep integration of LDAP across product lines (including Java, Solaris, the JES server products, and Sun development tools), has expanded the market share of JES Directory Server and established a leadership position in an otherwise fragmented category.

Metadirectories

Approximately 20% of companies are using metadirectories to reconcile directory information from different sources and an additional 10% of companies are either deploying or planning to deploy metadirectories. Despite the fact that Sun, Microsoft, Novell, Oblix, BT Syntegra and other significant companies offer metadirectory solutions, there is no clear leader in this product category. The reason for this is that (a) metadirectory implementations are invariably highly customized based on the needs of each organization, and (b) companies have looked to

standardization on a single technology, such as Microsoft Active Directory, to solve directory management and synchronization problems. Identity management has taken precedence over metadirectory solutions. Between enterprise provisioning solutions and identity management solutions, metadirectories have been relegated to the unglamorous task of directory synchronization. Specifically in the synchronization area, there are a number of relatively simple and relatively low cost point-to-point directory synchronization solutions as compared with the capabilities of metadirectory products to reconcile disparate identities and attributes across multiple directories.

Identity Management and Federated Directories

Roughly 17% of companies participating in the survey are using identity management solutions and an additional 10% are either deploying or planning to deploy identity management solutions. As with the metadirectory category, Sun, Microsoft, Novell, Oblix, Waveset Technologies and other companies offer identity management solutions but, for different reasons, there is no clear leader in the identity management category. The emerging industry solution, which promises to eventually make metadirectories obsolete or rather to incorporate them within larger solution framework, integrates authoritative sources of directory information, provisioning, directory integration (e.g., synchronization, LDAP referrals, etc.), and federated directory management.

Federated directory management and authentication have the potential to change the directory landscape so that the problems solved by metadirectories no longer exist. Currently available identity management solutions, like metadirectories, involve a variety of software components and require extensive customization for each company. Companies offering identity management products are not only software companies but solution providers as well as systems integrators. Standards, primarily those of the Liberty Alliance, are very promising in terms of eventually creating standards-based federation between otherwise disparate directory technologies.

Groupware

Groupware refers to integration of e-mail, directories, group calendaring and scheduling, workflow, corporate data, business processes and a variety of collaborative tools such as discussion forums and instant messaging. Integrated groupware products are offered by IBM Lotus, Novell, Microsoft and other software vendors. Products such as Exchange and Domino are generally used for simple e-mail rather than groupware. Group calendaring and scheduling is the first step away from simple e-mail to groupware; but applications that incorporate corporate data and workflow (modeling business processes) represent the true goal of groupware. Groupware provides companies with the ability to manage corporate knowledge and to re-engineer or automate business processes. Groupware solutions have been in the marketplace for over a decade, but groupware has yet to become ubiquitous like e-mail or directory services.

In the late 1990's the IT industry observed an eclipse of groupware applications and collaborative computing in general by a combination of simple e-mail and group calendaring (e.g., Microsoft Outlook and Exchange), basic intranets, and first generation enterprise portals. As the technologies have matured two things have become apparent: (1) simple e-mail and calendaring is inadequate in terms of collaboration and knowledge management; (2) intranet applications have become a communications channel rather than a rich collaborative computing platform. Traditional elements of groupware such as forms, workflow, integrated corporate data (via middleware or workgroup databases), and company initiatives involving re-engineering of business processes have not been a top priority in recent years. However, companies have realized that simple e-mail and intranets do not deliver the value of groupware. Stimulated partly by the emergence of business instant messaging, companies are currently taking a fresh look at collaborative computing.

Currently Deployed Groupware

Approximately one half of all companies (53%) participating in the survey are using groupware but the majority of these organizations (roughly 77% of groupware users or 41% of all companies) are using only calendaring and scheduling capabilities while a minority (roughly 33% of groupware users or 18% of all companies) are using groupware applications. Of the major groupware vendors (see Figure 9), Microsoft holds the greatest market share with its Microsoft Exchange product, although Exchange is rarely used for groupware beyond the scope of group calendaring and scheduling or shared folders. Companies have developed and deployed few groupware applications on Exchange.

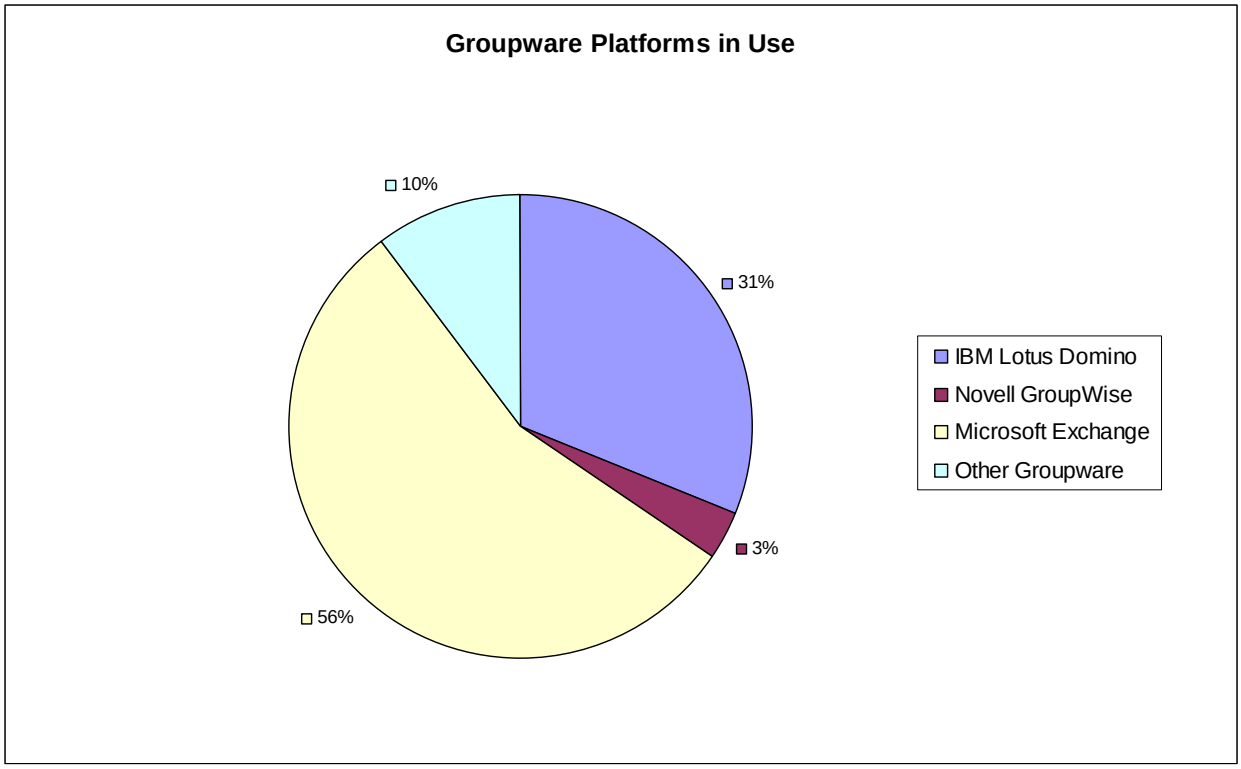

Figure 9. Use of Groupware Platforms

IBM Lotus Domino holds a greater share of the market than it does as an e-mail solution alone and the majority of groupware applications beyond the scope of group calendaring and scheduling run on Domino. The main reason for the disproportionate use of Domino over Exchange for groupware applications is the availability of groupware specific capabilities in the Domino platform along with related tools and APIs specific to groupware. Companies that are currently using groupware are either upgrading or planning to upgrade to newer versions of the same products, i.e., Domino customers are upgrading to Domino 6.5 while the majority of Exchange customers (using the groupware functionality of Exchange) are either upgrading or planning to upgrade to Exchange 2003.

Novell Customers Abandon GroupWise

Novell GroupWise accounts for 3% of groupware deployments but Novell GroupWise customers appear to be moving away from GroupWise. Approximately two thirds of Novell customers migrating to alternative groupware platforms are moving to Exchange while the remaining one third are moving to Domino. In theory, Novell's Linux strategy could reinvigorate GroupWise were Novell to offer its groupware server on Linux (see Open Source Messaging Servers above), but this seems unlikely with customers already moving away.

Other Collaborative Products

Approximately 10% of companies reported using a mixture of alternative collaborative computing products from vendors other than IBM Lotus, Microsoft, Novell, or Sun. While the survey did not ask specifically about alternate groupware products it is likely that the majority of these collaborative solutions are intranet portals.

New Collaborative Computing Landscape

While many IT customers reduced their use of groupware after the 1990's, interest in collaborative computing and knowledge management has risen in priority in 2004. There is no reason to believe, however, that new IT investment will go toward traditional groupware platforms. Since the late 1990's, intranets and enterprise portals, which are not typically based on existing groupware platforms, have been widely deployed. Groupware vendors have responded by exposing existing groupware applications and data through web technologies, e.g., Microsoft's WebDAV interface to Exchange and IBM Lotus' Domino Toolkit for WebSphere Studio. It is likely that new IT investments in collaborative technologies will be focused almost entirely on a combination of web-based applications, such as IBM Lotus Workplace, Microsoft SharePoint Portal, and instant messaging. IBM Lotus has foreseen this technological and IT investment transition and has anticipated the current trend with its focus on WebSphere and with the introduction of its Lotus Workplace product line. In contrast, Microsoft has, with the exception of instant messaging, continued to rely on its strong overall solution portfolio and development tools to meet customer needs in the collaboration area rather than focusing specifically on groupware.

Implications for 2005 and Beyond

IT Priorities in the Coming Year

The data indicate that modest increases in IT spending can be expected focused mainly on new technology adoption but not on IT operations where costs have been aggressively cut. At the same time, outsourcing will continue to increase. Adoption of instant messaging, wireless e-mail solutions, and Linux (at the expense of UNIX) will continue. At the same time, IT organizations will continue to focus on security and disaster recovery.

Outsourcing

A likely scenario is that IT operations will eventually be outsourced in most companies but that internal IT organizations will persist focusing on strategic initiatives. It remains unclear if outsourcing IT operations will result in a net reduction of IT expenditures and it is probable that outsourcing will result in different levels of cost savings for different size companies and in different industries (IT requirements vary significantly across industries even for companies of the same size in terms of the number of employees). For example, companies with less than 5000 users may not find outsourcing profitable, but companies between 7500 and 15000 users may find it very profitable, while companies with over 25,000 users may not find it profitable. As a practical matter, it will take some time to develop objective case studies in order to show the financial results of the outsourcing trend for different size companies and in different industries.

Server Operating System Trends

While wireless and IM can be expected to continue gaining acceptance at a steady rate, Linux may be viewed as a wildcard with disruptive potential, e.g., continuing to double the number of deployed servers year over year. While the implications of Linux adoption are both relatively clear and very significant for the UNIX server market, it remains less clear when and to what extent Linux will impact Windows as a server operating system. Pricing pressure on Microsoft is inevitable as Linux gains acceptance and as more applications become available on Linux.

E-mail and Messaging Trends

Anti-spam solutions will certainly be ubiquitous and 2005 is likely to bring record sales to companies in the anti-spam category. Smaller companies are likely to purchase services such as Postini or anti-spam appliances while larger companies are likely to operate their own enterprise anti-spam software solutions. The e-mail security area is unlikely to accelerate in 2005 although companies are likely to continue to deploy solutions related to regulatory compliance. As with Linux in general, Exchange compatible messaging servers running on Linux could eventually put pricing pressure on Microsoft.

Wireless Trends

While adoption of wireless technologies, and specifically wireless e-mail, can be expected to continue at roughly the same pace in 2005, Palm OS and PocketPC will probably continue to gain ground relative to RIM. There is every reason to believe that RIM will continue to dominate the wireless e-mail category for the foreseeable future.

Directory Services Trends

As Active Directory becomes pervasive in companies using Windows, identity management can be expected to see a modest increase in adoption while it expands its assimilation of metadirectories and enterprise provisioning. Federated directory technologies and related standards are likely to have the greatest overall impact in the directory category.

Groupware Trends

Renewed interest in collaborative technologies will certainly be followed by new spending in 2005 but there is little reason to believe that new investment will be made in established groupware platforms. For a number of reasons, the majority of future collaborative applications are likely to be based on web technologies.

Appendix A: Complete Listing of 2004 IT Priorities

1. Disaster Recovery
2. Cost Reduction
3. Collaboration and Knowledge Management
4. Security Solutions
5. E-mail Upgrade and Migration
6. Anti-spam Solutions
7. Anti-Virus Solutions
8. Server and Application Consolidation
9. Directory Services, Metadirectories and Identity Management
10. Wireless Messaging and Mobile Applications
11. Managing Reliability and Uptime
12. Standardization of IT Processes and Procedures
13. IT Productivity
14. Operational Support
15. CRM Implementation or Upgrade
16. Desktop OS or Application Upgrade
17. Standardization of Technology or Configurations
18. Order Processing Implementation or Upgrade
19. Accounting Software
20. ERP, e.g., SAP, Implementation or Upgrade
21. Database Solutions
22. Web Services
23. Outsourcing
24. Managing Performance and QoS
25. Human Resources Implementation or Upgrade

Appendix B: Index of Technology Companies

Ron Herardian has worked with collaborative communications infrastructures for over 15 years, including e-mail and messaging, directory services, metadirectories and identity management, calendaring and groupware, as well as wireless messaging and mobile applications. As Chief Systems Architect at Global Systems Services Corporation (GSS) Mr. Herardian works with enterprise customers and technology companies on strategy and architecture. Mr. Herardian, who speaks at seminars and industry events, is frequently quoted in the press and is the author of numerous technical papers as well as a contributor to the Webmaster's Guide to the Wireless Internet (Syngress Media, 2001) and other books. Mr. Herardian has served as Senior Technical Editor of DominoPower Magazine since 1996 and his articles appear regularly in industry publications.

Global System Services Corporation (GSS) is a provider of services, software, and solutions for e-mail and messaging, directory services, groupware, and wireless to customers worldwide. GSS provides a full spectrum of IT services to enterprises and technology companies ranging from technology strategy and solution architecture to project planning and management as well as technical implementation. Founded in 1995, GSS is based in Mountain View, California, in the heart of Silicon Valley. Additional information is available on the Web at http://www.gssnet.com, via e-mail (info@gssnet.com), or by telephone at 1 (650) 965-8669.