

The History of Notes and Domino

developerWorks Lotus

November 14, 2007
(First published December 20, 2005)

Notes and Domino began in the work of Ray Ozzie, Tim Halvorsen, and Len Kawell, first on PLATO Notes at the University of Illinois and later on DECNotes. Lotus founder Mitch Kapor saw the potential in Ozzie's collaboration project and the rest is history.

As you might expect of such complex and successful software, IBM Lotus Notes and Domino share a long and rich history. In some respects, this history mirrors the evolution of the computing industry itself -- the development and widespread adoption of PCs, networks, graphical user interfaces, communication and collaboration software, and the Web. Lotus Notes and Domino have been there nearly every step of the way, influencing (and being influenced by) all these critical developments.

This article briefly retraces the history of Lotus Notes and Domino, starting with the earliest conceptual and development stages and continuing through major feature releases. Along the way, it examines:

- Where the idea of Notes originated
- Notes pre-release development
- Release 1.0
- Release 2.0
- Release 3.0
- Release 4.0 and 4.5
- Release 5.0
- Release 6 and 6.5
- Release 7
- Release 8

The early days: The birth of an idea

You may find this a little surprising, but the original concept that eventually led to the Notes client and Domino server actually pre-dates the commercial development of the personal computer by nearly a decade. Lotus Notes and Domino find their roots in some of the first computer programs written at the Computer-based Education Research Laboratory (CERL) at the University of Illinois. In 1973, CERL released a product called PLATO Notes. At that time, the sole function of PLATO Notes was to tag a bug report with the user's ID and the date and to make the file secure so that other users couldn't delete it. The system staff could then respond to the problem report at the

bottom of the screen. This kind of secure communication between users was the basis of PLATO Notes. In 1976, PLATO Group Notes was released. Group Notes took the original concept of PLATO Notes and expanded on it by allowing users to:

- Create private notes files organized by subject
- Create access lists
- Read all notes and responses written since a certain date
- Create anonymous notes
- Create director message flags
- Mark comments in a document
- Link notes files with other PLATO systems
- Use multiplayer games

PLATO Group Notes became popular and remained so into the 1980s. However, after the introduction of the IBM PC and MS-DOS by Microsoft in 1982, the mainframe-based architecture of PLATO became less cost-effective. Group Notes began to metamorphose into many other "notes type" software products.

Ray Ozzie, Tim Halvorsen, and Len Kawell worked on the PLATO system at CERL in the late 1970s. All were impressed with its real-time communication. Halvorsen and Kawell later took what they learned at CERL and created a PLATO Notes-like product at Digital Equipment Corporation.

At the same time, Ray Ozzie worked independently on a proposal for developing a PC-based Notes product. At first, he was unable to obtain funding for his idea. However, Mitch Kapor, founder of Lotus Development Corporation, saw potential in Ozzie's work and decided to invest Lotus's money for its development. Kapor's business acumen, creativity, and foresight were critical in changing Ozzie's vision into reality.

Development on Notes begins

Near the end of 1984, Ozzie founded Iris Associates Inc., under contract and funded by Lotus, to develop the first release of Lotus Notes. In January 1985, shortly after Iris Associates began, Tim Halvorsen and Len Kawell joined Ozzie, followed soon after by Steven Beckhardt. All brought extensive knowledge and vision to the company as well as career-long interests in collaboration and messaging software at a time when such concepts were considered novel at best and impractical at worst. They modeled Lotus Notes after PLATO Notes, but expanded it to include many more powerful features. Alan Eldridge from Digital Equipment Corporation soon joined Iris Associates, contributing to the database and security features of the Notes architecture.

The original vision of Notes included on-line discussion, email, phone books, and document databases. However, the state of the technology at the time presented two serious challenges. First, networking was rudimentary and slow compared to today. Therefore, the developers originally decided to position Lotus Notes as a personal information manager (PIM), like Lotus Organizer, with some sharing capability. Second, PC operating systems were immature, so Iris had to write a lot of system-level code to develop things such as the Name Server and databases. Eventually, as networking became more capable, Iris began to speak of Notes as *groupware*. The term groupware (which eventually grew virtually synonymous with Lotus Notes) refers to

applications that enhance communication, collaboration, and coordination among groups of people.

To meet these goals, Lotus Notes offered users a client/server architecture that featured PCs connected to a LAN. A group could set up a dedicated server machine (a PC) that communicated with other groups' server machines (either on the same LAN or through switched networks). Servers exchanged information through replicated data (that is, there were potentially many copies of the same database resident on different servers, and the Notes server software continuously synchronized them). This made it just as easy for users to exchange information with co-workers in a branch office as with those in their own office.

The vision of the founders quickly evolved into the idea of creating the first virtual community. Tom Diaz, former Vice President of Engineering at Iris, said, "It was eccentric to think about group communication software in 1984, when most people had never touched an email system...the product was very far ahead of its time. It was the first commercial client/server product."

Another Notes key feature was customization. According to Tim Halvorsen, early on there was debate over the structure of Lotus Notes. He said the developers wondered, "Should we build applications in the product or should we allow it to be flexible and let users do it because we don't know what they will want?" They eventually opted for a flexible product that allowed users to build the applications they needed. Thus, Notes architecture used a building block approach; you could construct group textual applications by piecing together the various services that are available. "This was big in the success of the product," stated Halvorsen. "In no case do we say, 'no, this is the only way you can do it.'" Lotus Notes has survived the changes in the industry because it is a flexible product users can customize to fit their changing needs.

Around this time, Apple Computer released the Macintosh with a new easy-to-use graphical user interface. This influenced the developers of Lotus Notes, and they gave their new product a character-oriented graphical user interface.

Most of the core development was completed within two years, but the developers spent an additional year porting the code for the client and the server from the Windows operating system to OS/2. During this time, the developers at Iris used Lotus Notes to communicate remotely with people at Lotus. Halvorsen said, "Simply using the product every day helped us develop key functionality." For example, the developers needed to synchronize data between the two different locations, so they invented replication. "This wasn't in the original plan, but the problem arose and we solved it," said Halvorsen.

The development of Lotus Notes took a long time by today's standards. But according to Steve Beckhardt, this extended development period helped ensure the success of Lotus Notes. This made Lotus Notes a very solid product with no real competition in the market.

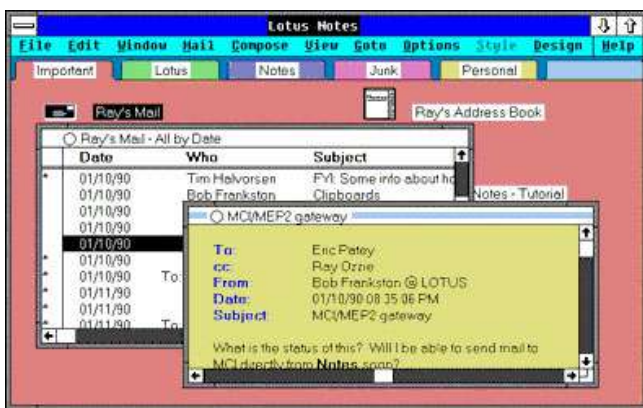
In August 1986, the product was complete to a point it demonstrated all of its unique capabilities and had preliminary documentation. It was ready to ship to the first internal Lotus users. At that time, Lotus evaluated and accepted the product. Lotus bought the rights to Notes in 1987.

Lotus Notes was successful even before its first release. The head of Price Waterhouse viewed a pre-release demo of Lotus Notes and was so impressed he bought 10,000 copies. At that time, it was the largest PC sale ever of a single software product. As the first large Lotus Notes customer, Price Waterhouse predicted that Lotus Notes would transform the way we do business. As we now know, they were right.

Release 1.0: A star is born

The first release of Lotus Notes shipped in 1989. During the first year it was on the market, more than 35,000 copies of Lotus Notes were sold. The Notes client required DOS 3.1 or OS/2. The Notes server required either DOS 3.1, 4.0, or OS/2. Figure 1 shows the Notes client user interface.

Figure 1. Release 1.0 screen



Release 1.0 provided several ready-to-use applications such as Group Mail, Group Discussion, and Group Phone Book. Lotus Notes also provided templates that assisted you in the construction of custom applications. This ability to design customizable applications using Lotus Notes led to a business partner community that designed Notes applications. Today, thousands of companies build their own software products that run on top of Lotus Notes, but the founders didn't expect Lotus Notes to be a developers' product. They envisioned a shrink-wrapped PC communications product that would run right out of the box. In reality, it became both.

Release 1.0 offered the following functionality, much of it revolutionary in 1989:

- Encryption, signing, and authentication using the RSA public-key technology, which allows you to mark a document in such a way that the recipient of the document can decisively determine that the document was unmodified during transmission. Lotus Notes was the first important commercial product to use RSA cryptography, and from that point on, users considered security as a prime feature of Lotus Notes.
- Dial-up functionality, including the ability to use the dial-up driver for interactive server access, the ability to allow users to specify modem strings, support for operator-assisted calling, and automatic logging of phone call activity and statistics.
- Import/export capability, including Lotus Freelance Graphics metafile import, structured ASCII export, and Lotus 1-2-3/Symphony worksheet export.
- Ability to set up new users easily, including allowing system/server administrators to create a user mailbox, to create a user record in the Name and Address database, and to notarize the

user's ID file through dialog boxes. You can also automatically create a user's private Name and Address database, in case that user wants to use private distribution lists.

- An electronic mail system that allows you to send mail without having to open your private mail file, to receive return receipts, to be notified when new mail arrives, and to automatically correct ambiguous or misspelled names when creating a mail message.
- On-line help, a feature not offered in many products at this time.
- Inclusion of the formula language, making the programming of Notes applications easier.
- DocLinks providing "hotlink" access between Notes documents.
- Keyword (checkbox and radio button) features.
- Access Control Lists (ACLs) determining who can access each database and to what extent.
- Ability to administer remote replicas of databases from a central place, if the database manager desired that behavior. You can replicate ACLs as an entire list, not just individual entries, to remote copies of the database.

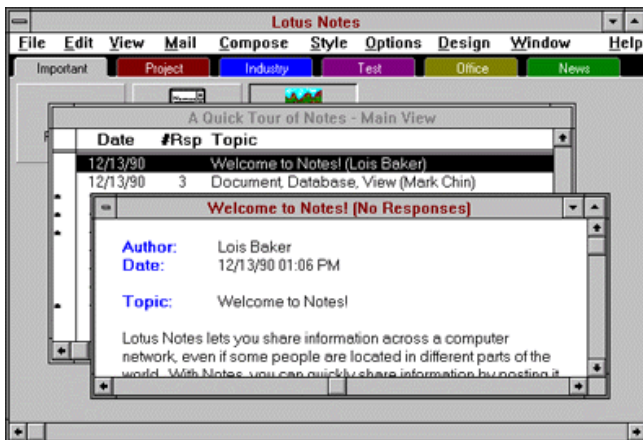
Release 1.1

The first set of enhancements to Lotus Notes became available in 1990. Release 1.1 was not a feature release, but an internal restructuring of the code that included new portability layers. The developers made a large architectural investment in Lotus Notes as a multi-platform product. They wrote a large amount of the product insulating the functional parts of Lotus Notes from the operating system. This means that, although Lotus Notes ran on many platforms, the developers didn't port the code from platform to platform. They developed the code for different operating systems in parallel. Already, this investment began to pay off. In this release of Lotus Notes, they supported additional operating systems: OS/2 1.2 Extended Edition, Novell Netware Requester for OS/2 1.2, and Novell Netware/386. However, their biggest achievement and the focus of this release was the added support for Windows 3.0, which was achieved by working closely with Microsoft as an influential Beta site for Windows 3.0.

Release 2.0: Bigger and better

The next major release of Lotus Notes shipped in 1991. For Release 2.0, scalability became the focus. After Release 1.0 sold to large companies, Iris realized Lotus Notes needed to scale to support 10,000 users. Lotus Notes was initially intended for small- to medium-sized businesses. The founders' original vision did not include large companies as users; they only expected 25 or so people logging in to one server. The reason for this was that the PCs of the day didn't have a lot of power. As the PCs and their networks became more powerful, so did Lotus Notes. Figure 2 shows the Release 2.0 user interface.

Figure 2. Release 2.0 screen



Throughout the 1990s, as Lotus Notes accommodated more and more users, larger companies bought it. Sales growth was slow, but steady as Lotus sold the product to high-end customers willing to invest time and effort getting large groups of users up and running. As these early customers used Lotus Notes with great success, the installed user-base grew.

Originally, there was a 200-license minimum for Lotus Notes; Lotus did not sell individual copies. As a result, the minimum purchase price was \$62,000. Lotus targeted big companies because they felt that only those companies would comprehend and exploit the potential of the product. Price Waterhouse and other early test sites showed that the big companies got it.

Tim Halvorsen remembers that as Lotus Notes slowly began to grow, so did the development team. By the second release, there were approximately 12 developers working on Lotus Notes. For the early releases, Halvorsen said, "We were very responsive to the needs of our customers, but then we also tried to build it with the ability to accommodate future changes in the industry."

Release 2.0 included the following enhancements:

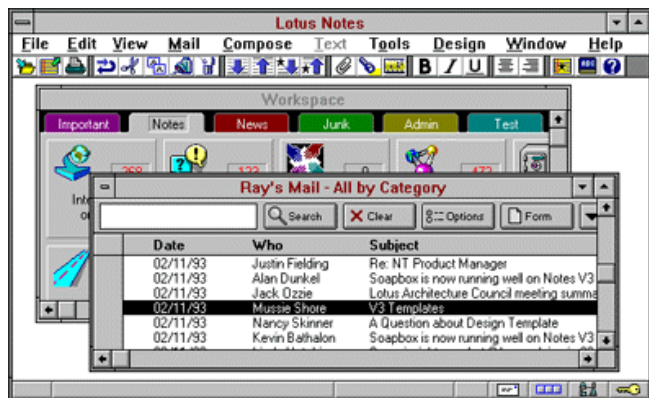
- C API
- Column totals in views
- Tables and paragraph styles
- Rich text support
- Additional formula language @functions
- Address look-up in mail
- Multiple Name and Address books
- Return receipt for mail memos
- Forwarding documents from mail
- Larger databases and desktop files

Release 3.0: Lotus Notes for everyone

Lotus Notes Release 3.0 shipped in May 1993. By this time, Iris had about 25 developers working on Lotus Notes. Release 3.0 was build number 114.3c. This means that it was the 114th successful build of Lotus Notes ever and that it took three tries to complete the final build.

At the time of the release, more than 2,000 companies and nearly 500,000 people used Lotus Notes. The goal of Release 3.0 was to build further on what Lotus Notes already was, to make the user interface cooler and more up-to-date, and to evolve it further as a cross-platform product. Lotus aimed the product at a larger market and reduced the price accordingly. Release 3.0 featured the first of a series of rewrites of the database system, NIF, to make the product scale to even larger user populations. This release was suitable for about 200 users simultaneously using a server. Figure 3 shows the Release 3.0 user interface.

Figure 3. Release 3.0 screen



Release 3.0 also added greater design capability and many additional features, including:

- Full-text search
- Hierarchical names, views, forms, and filters
- Additional mobile features, including background replication
- Enhanced scalability
- Alternate mail capability
- Development of common API strategies for cross-platform Notes applications
- Selective replication
- Support for AppleTalk networks
- Deployment and administrative improvements
- Support for the Macintosh client
- A server for the Windows operating system

Lotus SmartSuite shipped in 1993 with a Bonus Pack, called Notes F/X that allowed applications to share data and still integrate the data in a Notes database using OLE.

In May 1994, Lotus purchased Iris Associates, Inc. This had very little effect on the product itself, but it did simplify some of the pricing and packaging issues surrounding Lotus Notes. In May 1995, Lotus released InterNotes News, a product that provided a gateway between the Internet news sources and Lotus Notes. This was the first project that reflected the growing influence of the Internet on Lotus Notes.

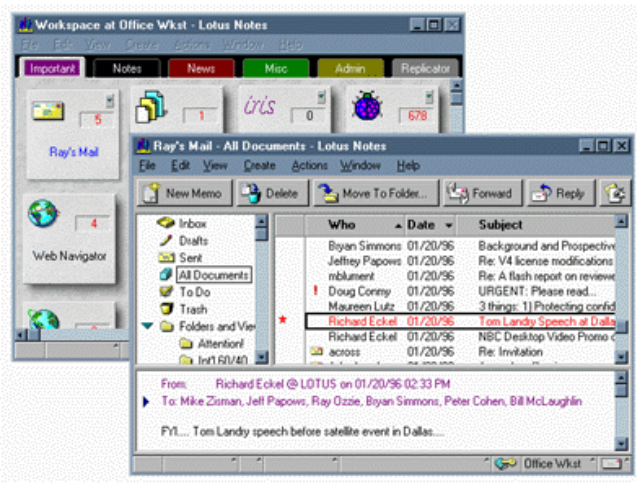
Release 4.0: A whole new look

In January 1996, Lotus released version 4.0. This release offered a completely redesigned user interface based on customer feedback. This interface exposed and simplified many

Notes features, making it easier to use, program, and administer. When the developers gave a demonstration of the new user interface at Lotusphere (a yearly user group meeting), they received a standing ovation from the crowd of customers.

The product continued to become more scalable. It became faster and faster as companies added additional processors to multiprocessor servers. Lotus cut the price of Lotus Notes in half, and thus successfully gained a larger market share. Figure 4 shows the new user interface introduced in Release 4.0.

Figure 4. Release 4.0 screen



In addition, Lotus Notes began to integrate with the Web, and many new features reflected the prominence of Web technology in the industry. Ray Ozzie, the first Notes developer and founder of Iris Associates, saw the importance of the Web before the Web became the phenomenon it is today. This was a key element in the success of Lotus Notes. A new product called the Server Web Navigator allowed the Notes server, connected to the Web, to retrieve pages off the Web, and then allowed users to view the pages in a Notes client.

Another product that leveraged the Web was a server "add-in" called the InterNotes Web Publisher. Now users could take a Notes document, convert it to HTML, and display it in a Web browser. The server could statically take Notes documents and publish them to the Web. It was not yet dynamic because there was a time delay involved in this process. The documents went to the file server and were later published to the Web.

Release 4.0 also offered:

- LotusScript, a programming language built into Lotus Notes
- A three-paneled UI for mail and other applications with document preview ability
- Pass-thru servers
- A new graphical user interface for server administrators
- Built-in Internet integration, including Web browser accessible Notes databases
- Upward mobility, including locations and stacked icons
- An enhanced replicator page

- Rapid application development and programmability as a result of an integrated development environment (IDE), infoboxes, and redesigned templates
- View, folder, and design features, including the ability to create action bars, the ability to create navigators that allow easy graphical navigation among views, and improved table support
- Search features, such as the ability to search a database without indexing it, and the ability to add conditions to a search with the Search Builder without writing a formula
- Security features, such as the ability to keep local databases secure and the ability to restrict who can read selected documents
- Internet server improvements, including SOCKS support, HTTP proxy support, and Notes RPC proxy support

In July 1995, IBM purchased Lotus, primarily to acquire the Notes technology. The buyout impacted Lotus Notes in a positive way. Prior to the buyout, the Notes developers felt that they were facing some strategic uncertainty as a result of the growing prominence of the Web and increasing competition in the market. The IBM acquisition provided solid financial backing, access to world class technology, including the HTTP server that became IBM Lotus Domino, and an increased sales force. Lotus Notes now sold to very large Fortune 500 companies, and it sold to entire corporations instead of just departments. These positive gains gave the developers of Lotus Notes the freedom to invest in long-term projects. In 1996, following the release of Lotus Notes 4.0, the business and technological competition exploded -- for messaging products, for Web servers, and for development systems for these products.

The development of Release 4.0 took more than two years, which in light of the growing competition and the shorter development cycles of competitors using the Web to release products, was now too long. To give large enterprises a highly stable Notes system and to ensure that Iris Associates would continue its tradition of technical leadership, the developers divided the Notes product line into the following two branches:

- A product line of new feature releases, beginning with Release 4.5, offered first-rate new functionality in the fastest development cycle possible while still maintaining good quality. Market competition and the needs of the software vendors building applications on top of Lotus Notes influenced these releases.
- 90-day releases, also called quarterly maintenance releases, contained few or no new features. Maintenance input from existing Notes customers almost entirely drove this second product line. Many of these customers were the large-enterprise users who heavily stressed the server and were among the first to find deployment-blocking bugs. The sole purpose of these releases was to gather up fixes for bugs, test them in an integrated manner, and make them available to licensed customers. These releases were more conservatively managed than the new feature releases, and they were appropriate for large companies who were more interested in a highly stable release of the product than in pioneering brand new technology. A third digit in the product release number designated maintenance releases, such as the 3 in 4.5.3.

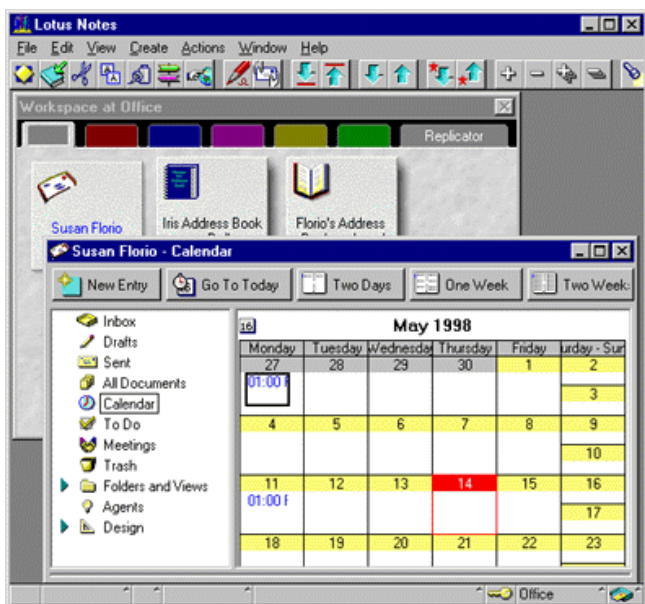
Even today, at any particular time, there are two Notes families (or two code streams) maintained this way, while a third code stream is underdevelopment for the next feature release.

New users had a choice as to the release of Lotus Notes they could buy. Most new users received the current feature release. As time passed, most users began to combine the releases, so that on some machines they took advantage of the new feature release, while other machines ran a maintenance release version. These two releases of the product did merge at certain points in the development process. When coding started for a new feature release, all the code from past releases, including the bug fixes were merged together and a new code stream began. This merging process happened a few times early in the development process of the new feature release. This merging process ensured that the reliability of feature releases was high.

Release 4.5: The Domino theory

Lotus changed the brand name of the Notes 4.5 server product to "Domino 4.5, Powered by Notes" in December 1996 and shipped the Lotus Domino 4.5 server and the Lotus Notes 4.5 client. Lotus Domino transformed the Notes Release 4.0 server into an interactive Web applications server. This server combined the open networking environment of Internet standards and protocols with the powerful application development facilities of Lotus Notes. Lotus Domino provided businesses and organizations with the ability to rapidly develop a broad range of business solutions for the Internet and for intranets. The Domino server made the ability to publish Notes documents to the Web a dynamic process. Figure 5 shows the Release 4.5 calendar user interface.

Figure 5. Release 4.5 screen



Release 4.5 provided the following improvements:

- Messaging, including native Notes calendar and scheduling, SMTP/MIME support (SMTP MTA), cc:Mail network integration (cc:Mail MTA), POP3 support (on the Notes server), and a Mobile corporate directory
- Internet server, including Domino.Action, and multi-database full-text searching

- Personal Web Navigator, including client-side retrieval of HTML pages over HTTP, Personal Web Navigator database, Java applet execution, Netscape plug-in API support, and HTML 3.2 support
- Scalability and manageability, including Domino server clusters, directory assistance, Administration Process enhancements, new database management tools, Windows NT single logon support, and Notes/NT user management
- Security, including Execution Control Lists and password expiration and reuse
- Programmability, including Script Libraries, OLE2 support on the Macintosh, extended OCX support, LotusScript enhancements, and IDE enhancements
- Enhanced application development capability with support for Java 1.1 agents and Java-based access to Notes objects
- Seamless Web access from the Notes client
- Ability to hide design elements from a Web browser or a Notes client if necessary

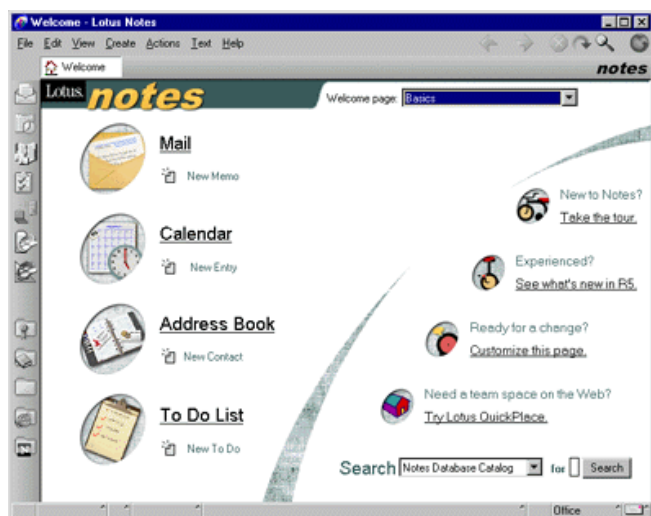
Release 5.0: Web integration by design

Lotus Notes and Domino Release 5.0 shipped in early 1999 as the 160th build since 1984. The Release 5 code was a direct descendent of Release 1.0 and parts of its architecture still supported Release 1.0 clients. But, while backwards compatible, Release 5 was definitely moving into the future.

With Release 5's continued Web integration, it was no longer a question of Lotus Notes versus the Internet -- they became inseparable. The new user interface for Release 5 illustrated this by taking on more browser-type characteristics. Release 5 also supported more Internet protocols and extended its reach to include access to information stored in enterprise systems as well as Notes databases.

Figure 6 shows the improved Lotus Notes Release 5 Welcome page.

Figure 6. Release 5.0 screen



For application developers, Lotus Domino Designer, the successor to Lotus Notes Designer for Domino, offered significant enhancements that make development more productive. Lotus Domino

Designer is an integrated development environment with the tools needed to rapidly build and deploy secure e-business applications.

The new Lotus Domino Administrator made Domino network administration easier with a redesigned user registration and new tools for server monitoring and message management. Important enhancements to the Domino server included:

- Internet messaging and directories, including full-fidelity messaging, native MIME and SMTP support, the new Directory Catalog, and LDAP features
- Expanded Web application services, including CORBA-standard distributed objects, Java, JavaScript, Web clusters, and Microsoft Internet Information Server (IIS) HTTP services
- Database improvements, such as transaction logging and a new on-disk structure (ODS)

Release 5.0. was available on Windows NT, Windows 95, Windows 98, OS/2, Netware, and UNIX. This wide availability, combined with its ability to entwine Lotus Notes with the Internet, set a new standard for:

- Easy access to all the information that is important to you, be it personal or public
- Server independence because of the ability to use Lotus Notes with Lotus Domino Release 5 as well as other Internet-standard servers
- The ability to read and send messages to any Internet mail server without needing to know about Internet standards, thanks to one, consistent interface
- The latest innovations in Internet messaging with native support for all the major Internet standards

On the Notes client-side, Release 5 provided easy access to all the information that is important to you -- whether that information is personal (such as your email and calendar) or public (such as your favorite Web sites and Internet newsgroups). The Notes client included a new browser-like user interface with a customizable Welcome page for tracking your important daily information. It also included improvements to the applications you use in your daily work, such as mail, calendar and scheduling, Web browsing, and discussions. As interface designer Robby Shaver said when discussing the Release 5 client, "The number one goal is to just make the client easier."

Release 6.0: Doing things faster, better, and cheaper

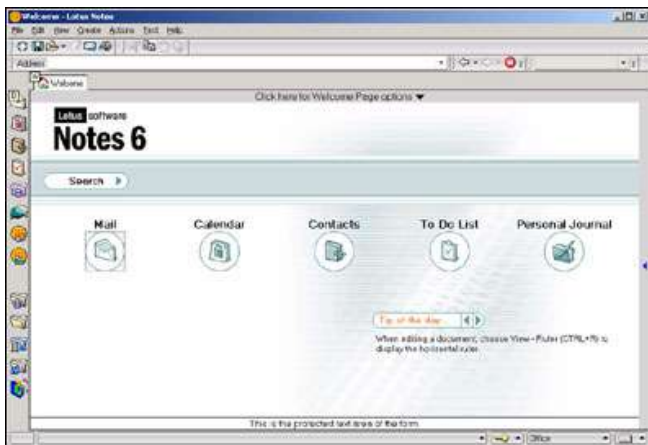
When Lotus Notes 6 and Lotus Domino 6 were introduced in October, 2002, the business world was dominated by talk of lower cost of ownership, increased productivity, and faster deployment and turnaround. This reflected both the direction of business software as well as each corporation's need to perform more efficiently in the face of ever-increasing time and financial pressures. The message from our customers was clear: We need to do more with less, and we need to do it faster.

As usual, Lotus Notes and Domino were in the forefront of this trend. The Domino 6 server offered improved installation as well as scalability and performance enhancements designed to streamline maintenance and lower administration overhead. Lotus Domino Designer 6 made it easier to create complex applications and to reuse code, reducing development and deployment time. And

Lotus Notes 6 remained the collaboration tool of choice for tens of millions of users worldwide with enhanced calendar and scheduling as well as other personal productivity improvements.

For example, the Notes 6 default Welcome page was redesigned to increase ease of use and to make more functionality accessible:

Figure 7. Notes 6 Welcome screen



The Notes 6 Welcome page had many new features, including:

- Welcome page action buttons, for example, to create a new mail memo or calendar entry
- A preview pane similar to standard Notes databases
- A wizard for customizing and personalizing your Welcome page
- The Launch Pad for quick access to applications, tasks, and links
- A Tip of the Day about using the Notes client
- Quick Notes interface to create mail, contacts, journal entries, and reminders without having to open the respective databases

One of the more significant Notes 6 enhancements was improved calendar and scheduling, offering new functionality to help manage your time more effectively. For example, the new mini-view, colors, and summary features help to quickly identify the most pressing items. Lotus Notes 6 offered multiple options for creating and editing meetings and other calendar entries. Rescheduling could be done primarily through a new point-and-click interface. These and other Notes 6 C&S features are described in detail in the article, "[Saving time with Notes 6 Calendar and Scheduling](#)." And for a complete rundown of new Notes 6 features, see the article, "[Notes 6 Technical Overview](#)."

Lotus Domino Designer 6 also focused on the trend of doing more with less, offering enhancements in the following areas:

- Reusability features that allow designers to take code written for one application and to reuse it in another.
- Agent design and management with a redesigned agent interface and enhanced agent properties along with the ability to attach and debug agents running on the server.

- Presentation development, introducing new features that bring the creation and management of new presentation elements, such as layers and style sheets, into the integrated design environment.
- Managing complex applications with better support both for applications that span multiple databases and that include objects that aren't traditional elements of an NSF file and for third-party tools for use on the design elements of these applications.
- Database development, making it easier for developers to do the basic work of building an application -- from small UI changes to major additions like type-ahead for @functions, HTML in the programmer's pane, the Data Connections resource type, and features to support mobile applications.

These and other Lotus Domino Designer 6 features are described in the article, "[Domino Designer 6 Technical Overview](#)."

But perhaps the most significant enhancements in Lotus Notes/Domino 6 were in the Domino server. As with the Notes client and Lotus Domino Designer, our primary theme was helping you work more efficiently. For example, installation and setup offered more options and an improved interface to allow administrators to get servers up and running faster. And we made it easier for an administrator to centrally manage multiple remote servers through features such as policy-based management. Policies help you maintain standard settings and configurations for registration, setup and desktop, archiving, and security. For more information about policy-based management, see the article, "[Policy-based system administration with Domino 6](#)."

Server scalability and performance was another major issue. To address these needs, Lotus Domino 6 introduced features such as network compression, which can reduce the number of bytes sent during transactions by up to 50 percent, and statistics monitoring and analysis to help you plan and run individual systems (as well as your whole domain) more efficiently. In Lotus Domino 6, you can monitor performance statistic profiles using charts that display the statistics in real-time or historically. And the Domino Server Monitor includes server profiles that monitor tasks and processes specific to a certain subset of servers.

Of course, security remained an overarching concern for all administrators. Lotus Domino 6 boasted new security functionality, such as the new certificate authority, delegated server administration, and improved password management. And you could push Admin ECLs to clients dynamically on an as-needed basis, making it easier to deliver timely updates and to update clients who received the default ECL during setup.

Other new Lotus Domino 6 features included:

- Messaging enhancements, including iNotes Web Access and Domino Everyplace servers, extending access to Domino's messaging infrastructure. And new features for the Web server expanding the capabilities for Web application development and deployment.
- Changes to directories, for example the ability to use LDAP, NameLookup, or both to serve up directories, and a directory indexer task that updates views in the Domino Directory.
- Domino hosting features that allow multiple organizations to be transparently hosted by a single logical Domino server.

- Server cluster enhancements, including making the Cluster Administrator a server thread, adding new settings to control the number of active Cluster Replicators, and adding new Cluster Replicator commands for better control over cluster replication and information gathering.
- Domino Off-Line Services (DOLS) enhancements.

The article, "[Domino 6 Technical Overview](#)" describes these and all other new Lotus Domino 6 features.

Release 6.5: Everybody's talking

In September 2003, IBM released Lotus Notes/Domino 6.5. This version offered tighter integration with other IBM/Lotus technologies, such as IBM Lotus Sametime instant messaging and IBM Lotus Domino Web Access (formerly iNotes Web Access). And we expanded on the "faster, better, cheaper" theme of release 6.

In keeping with the Notes/Domino release plan of alternating between focusing on the server in one release and the client in the next, much of the effort around Release 6.5 involved end-user productivity enhancements for the Notes 6.5 client. One of the more significant of these enhancements (the one that inspired the title of this section) was Lotus Sametime instant messaging integration. From within the Notes 6.5 client, you could now log into Lotus Sametime, check whether a user was online, start a chat with one or more users, and conduct online meetings. This significantly extended the reach of the Notes client, allowing you to instantly communicate and collaborate with others. The inclusion of instant messaging at no additional charge remains a unique advantage of Lotus Notes in Release 6.5 and beyond.

Another example of the Notes 6.5 commitment to productivity was its expanded calendar and scheduling functionality. You could now create a calendar entry or To Do item from a mail message, simply by dragging and dropping the message from any view in your mail file onto the Calendar or To Do bookmark. You could also use drag and drop to create a mail message out of a calendar entry, or a calendar entry out of a To Do item. Other calendar and scheduling improvements included the ability to reschedule one or more instances of a repeating meeting without affecting the other meetings, and printing distribution lists in mail messages or calendar entries.

In Notes 6.5 mail, you could now mark a mail message with the Follow Up flag to indicate that you need to take future action on that message. Icon indicators helped you determine more quickly whether or not you have already replied to a message or forwarded it. You could also specify that mail received from a specific sender be automatically sent to your Junk mail folder. And you could more easily create QuickRules.

The Lotus Domino Web Access client was improved to help bring its level of functionality closer to the Notes client experience. New Notes-like features included Lotus Sametime integration, better calendar and scheduling, the ability to copy messages into calendar entries or To Do items, template customization, one-click sending and filing of messages, adding a person to a Contacts list, and local archiving.

For Lotus Domino Designer 6.5, Domino application developers could now add Lotus Sametime person awareness to their applications by enabling a names field in a form to show online status. You could also add awareness to views by enabling columns to show online status. Another application development feature was Lotus Domino Toolkit for WebSphere Studio 1.1, a set of Eclipse plug-ins for creating JavaServer Pages (JSPs) with Domino Custom Tags. Lotus Domino Designer 6.5 also offered LotusScript classes for Java/CORBA and COM bindings and an enhanced LotusScript NotesRegistration class.

The Lotus Domino 6.5 server expanded the number of supported platforms on which Lotus Domino runs. New platforms included Linux on zSeries (S390) and Windows Server 2003. And Lotus Domino 6.5 added support for the Mozilla 1.3.1 browser on Linux, including support for offline access in Lotus Domino Web Access on a Linux client.

Of course, performance was as important as ever. To address this need, Lotus Domino 6.5 added new Server.Load workloads, including workloads for Lotus Domino Web Access, Mail, and IMAP. Linux administrators welcomed the ability to monitor platform statistics for Linux and Linux on zSeries platforms. And you now had better control over database replications. Lotus Domino 6.5 for iSeries added support for multiple versions of Lotus Domino on one partitioned machine. And Lotus Domino for z/OS added hardware cryptography capability to reduce CPU rates when SSL is enabled.

Other server-related enhancements included the Unified Fault Recovery/Cleanup Scripts interface, the ability to enable/disable NSD to collect diagnostic and other data, free-running Memcheck to validate in-memory data structures, timestamps in SEMDEBUG.TXT, and the ability to collect and record system and server data at startup.

Simultaneous with the ship of Lotus Notes/Domino 6.5 was the release of Lotus Enterprise Integrator 6.5. New Lotus Enterprise Integrator 6.5 features included the ability to assign reader-level access to Activity documents and Connection documents; a dependent activity report for showing subordinate relationships for all activities in the Lotus Enterprise Integrator Administrator; support for Linux Red Hat 7.2, United Linux 1.0, Windows 2003, and Sun Solaris 9i; the ODBC Connector for iSeries; and improved performance for Virtual Documents.

On final note: In Release 6.5.1, we synchronized the release of Lotus Notes/Domino with the Lotus extended products, including Lotus Sametime, IBM Lotus QuickPlace, and IBM Lotus Domino Document Manager.

Release 7.0: New horizons

Lotus Notes/Domino 7 was released in August, 2005, and customers' expectations were never higher. They wanted us to continue the trend of making Lotus Notes and Domino easier to deploy and manage with fewer resources. At the same time, users increasingly looked at Lotus Notes and Domino as critical components of an all-encompassing on-demand workplace, fully integrated with other IBM technologies, such as IBM WebSphere Portal and IBM DB2.

Many of the most significant enhancements in Release 7 were for the Domino 7 server. For example, Domino 7 server administration tools now supported DB2 databases. In addition, Lotus Domino 7 offered better integration with IBM WebSphere Application Server and WebSphere Portal. And Lotus Domino 7 provided better integration for Web standards.

The new Domino Domain Monitoring (DDM) feature provided administrators one location within the Domino Administrator to view the status of multiple servers across a domain or multiple domains. DDM used probes to gather information across multiple servers, checking for any issues. This information was then collected and presented in a special database (DDM.NSF). DDM provided ongoing, 24/7 monitoring of all your servers with fast recognition and reporting of critical server and client issues.

Another important addition to server management in Lotus Domino 7 was Activity Trends. This feature collected and stored statistics on activities involving the server, databases, users, and so on. This information allowed you to review Activity Trends information to better judge how database workload was distributed among the servers in your environment. Activity Trends even provided recommendations for balancing database workload, based on resource goals that you specified, and included a workflow to help implement these recommendations.

Lotus Domino 7 offered autonomic diagnostic collection, allowing you to evaluate call stacks generated when a Notes client or Domino server crashed, using the automatic diagnostic collection functionality introduced in Lotus Notes/Domino 6.0.1. Autonomic diagnostic collection extended the capability of automatic data collection by analyzing call stacks located in the Fault Report mail-in database, and then evaluating this data to determine whether or not other instances of the same problem had occurred.

Lotus Notes Smart Upgrade was another area of improvement. Lotus Domino 7 provided a mail-in database to notify administrators of the status of Smart Upgrade status (success, failed, or delayed) by each user and machine. If a server in a cluster failed, Smart Upgrade could switch to another member of the cluster. To avoid excessive server load, the Smart Upgrade governor limited the number of downloads from a single server. Other Domino 7 administration enhancements included InstallShield Multiplatform (ISMP) installation and Linux/Mozilla support for the Web Administration client.

New security functionality in Lotus Domino 7 included stronger keys for encryption (1024-bit RSA keys and 128-bit RC2). Lotus Domino 7 also provided better support for single sign-on (SSO) and new security-related APIs for handling of encrypted mail. (See the developerWorks Lotus article, "[Security APIs in Notes/Domino 7](#).") Other security features included private blacklist/whitelist filters for SMTP connections, and DNS whitelist filters for SMTP connections. Whitelist filters could be enabled on the client and at the DNS level. Mail Rules allowed users to select blacklists.

Some of the most important work in Lotus Domino 7 was done behind the scenes to improve server performance, and this work paid off. In tests done with the NotesBench R6Mail and R6iNotes workloads on one Domino partition on all platforms, server scalability improved by a whopping 80 percent compared to Release 6.5 (and a *400 percent* improvement on Linux). Our tests also showed that Lotus Domino 7 reduced server CPU utilization (up to 25 percent). Other

performance-related enhancements included Linux thread pools, IIOp performance improvements, networking performance improvements, better mail rule scalability, and improved scalability for Lotus Domino Web Access mail servers. All these were designed to help reduce the cost and overhead of maintaining your Lotus Notes/Domino environment.

Lotus Notes 7 provided users with enhanced calendar and scheduling, better Lotus Sametime integration, and improvements to mail, desktop, and interoperability. For calendar and scheduling (C&S), Lotus Notes 7 added a Calendar Cleanup feature for calendar maintenance. Calendar Cleanup let you delete entries based on creation/last modified dates. You could also select the type of entries (Calendar or To Do) to delete. You could have your calendar accept a meeting even if it conflicts with an existing meeting, and cancel C&S workflow when responding to a meeting invitation. Lotus Notes 7 also significantly improved Rooms and Resources functionality to better manage your rooms and resources. (For more on this topic, see the developerWorks Lotus articles, "[Rooms and Resources design in Lotus Notes/Domino 7](#)" and "[New Rooms and Resource features in Lotus Notes/Domino 7](#).")

Lotus Notes 7 further expanded Lotus Sametime integration. Presence awareness was added to C&S views, Team Rooms, Discussions, To Do documents, the Personal Name and Address Book, the Rooms and Resources template, and the Domino Directory. In addition, Notes instant messaging chat windows were now in a separate thread. Notes instant messaging meetings provided features such as screen sharing, whiteboard, audio, and video. And you could now paste Notes URLs into chat windows.

For mail users, Lotus Notes 7 offered a Quick Follow Up feature, allowing you to select one or more mail messages and mark them for follow up without displaying the Follow Up dialog box. Follow Up actions were also available from the right-click mouse menu. Mail Rules now supported the Stop Processing action and blacklist/whitelist spam. A new status bar icon indicated whether email you receive was digitally signed, encrypted, or both. You could also work with Notes mail through the Smart Tags feature in Microsoft Office XP. (For more information, see the tip, "[Using Smart Tags in Lotus Notes/Domino 7.0](#).")

Other Notes 7 enhancements included improved archiving, enhanced Meetings view, and AutoSave (see the developerWorks Lotus article, "[All about Autosave in Lotus Notes/Domino 7](#)").

As we mentioned earlier, Lotus Notes/Domino 7 provided the ability to use DB2 as a data store. To support this, Lotus Domino Designer 7 featured two new types of views for DB2-enabled databases: DB2 Access views and DB2 Query views. DB2 Access views define how your data is organized, and DB2 Query views use an SQL query to populate its data (instead of a view formula that selects documents from within the NSF file). You could define fields to be accessed relationally on a per-form or per-database basis.

A new design element let you maintain the function of a Web service. This design element includes all the attributes typically expected of a Web service. For more information, see the article, "[Lotus Notes/Domino 7 Web Services](#)."

Lotus Domino Designer 7 offered several new usability features to its interface. For example, you could now sort the Comments column. You could also define the name, alias, and comment directly in the design list and add view actions to right-click menus. Lotus Domino Designer 7 also provided a toolbar icon to toggle the LotusScript debugger state (on or off). Lotus Domino Designer 7 also included programmability enhancements, including new functions, properties, and methods.

Lotus Domino Designer 7 added support for JVM 1.4.2 and the Java debugger. Other new features included WebSphere Portal integration improvements, View Shared Column support, and support for multiple User Profile columns in a view.

Lotus Domino Web Access 7 provided a number of new features, including a new Lotus Domino Web Access client template (dwa7.ntf). Lotus Sametime instant messaging awareness integration now more closely matched the Notes client awareness features. Productivity enhancements included single-click Follow Up, Quick Mail Rule, and forwarding any Lotus Domino Web Access object in an email.

Release 8: Built on Eclipse

Looking ahead

Read the special paper, [IBM Point of View on desktops of the future and How to Get Started Today](#).

Lotus Notes and Domino 8, first announced at the IBM Lotus Technical Forum in Hannover, Germany, in June, 2005, was released in August, 2007. This latest version of Lotus Notes and Domino shows significant changes over earlier versions and builds on the strengths of the collaboration and messaging product with a new user interface, powerful new functionality, innovative productivity tools, and expended support for business solutions.

The Lotus Notes 8 client is based on the Eclipse framework, making it possible to run Eclipse-based code within Lotus Notes. This fundamental innovation facilitates a significant leap: Eclipse plug-ins can be wired together with Lotus Notes applications as composite applications. And by building composite applications, you can get quick access to your business information in one view. Similarly, you can extend the client program and customize the user interface.

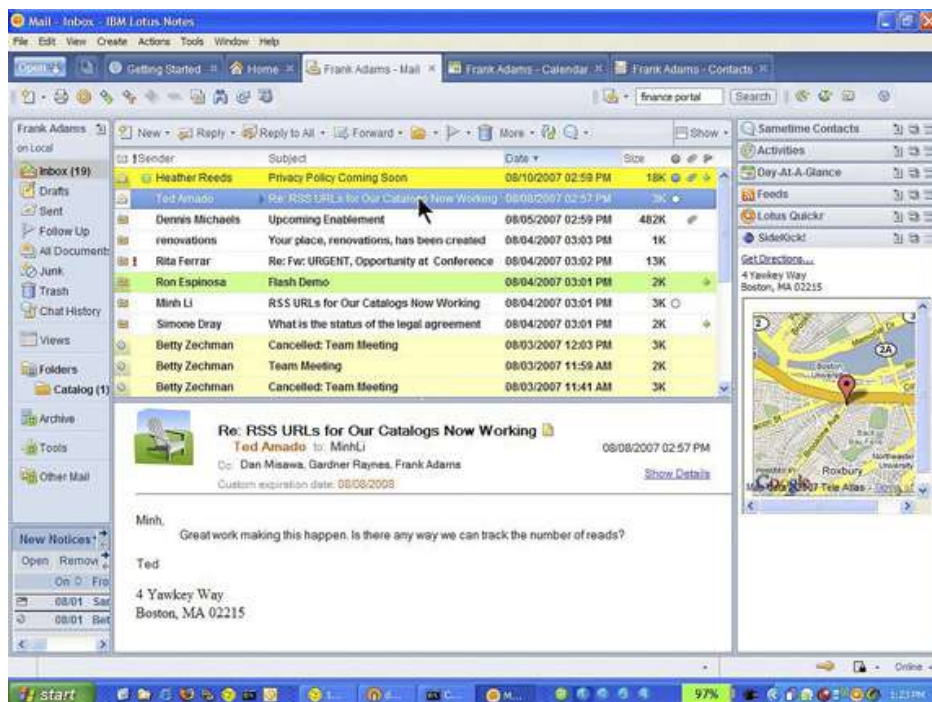
Lotus Notes 8 is built on IBM Lotus Expeditor, IBM's universal managed client software, which, in turn, is built on Eclipse. In essence, Lotus Notes 8 is now on an open-source, Java-based platform. New features in Lotus Notes 8 include:

- Open button for fast access to the applications you use most often
- Sidebar that displays critical information and alerts including Lotus Sametime V7.5.1 contacts, day-at-a-glance, RSS, and ATOM feeds
- Context-sensitive toolbars and customizable view preferences
- Support for activity-centric computing
- Word processing, spreadsheet, and presentation applications, which support Open Document Format (ODF), Microsoft Office, and Lotus SmartSuite file formats
- Omnipresent search center for email, calendar, the Web, and your desktop

- Collaboration history that lets you search and view your collaboration with specific people
- Mail recall feature
- Conversation mode that lets you collect and review email threads based on subject headings

The user interface in the Lotus Notes 8 client has been updated as shown in figure 8.

Figure 8. Release 8 user interface



Lotus Domino 8 includes improvements in performance, administration, and serviceability. Many of the changes in Lotus Domino 8 support new features in Lotus Notes 8, such as message recall, improved user registration, and mail threading. Support for changes to application development include managed deployment of composite applications to Lotus Notes 8 clients and the ability for Lotus Domino to be both a Web service consumer and a Web service provider.

Lotus Domino 8 supports an open application infrastructure and lets you deploy composite applications in Lotus Notes 8 and lets you extend Web services support. New features in Lotus Domino 8 include:

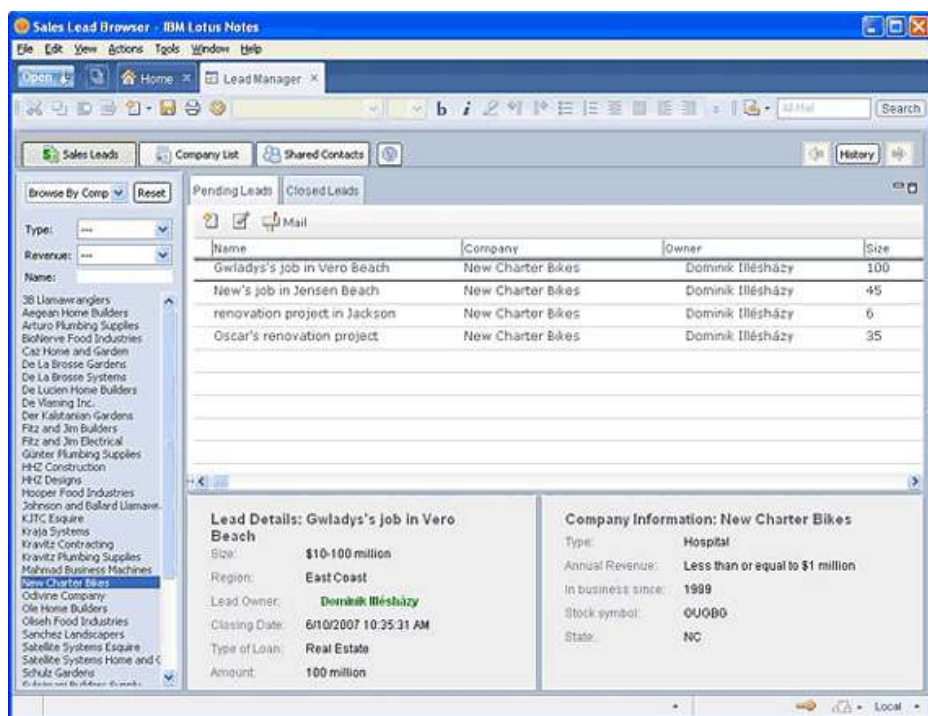
- Policy management of inbox cleanup to help manage inbox sizes
- Integration with IBM Tivoli Enterprise Console software
- Support for RedHat Linux 5
- Improved Internet security features, including the ability to prevent access to Internet password fields in the Domino Directory and Internet account lockout due to password entry failure

Lotus Domino Designer 8 offers new capabilities that are in step with the new features of Lotus Notes and Domino 8. It includes new features and functions that enable you to provide more value through Lotus Notes and Domino applications and support service-oriented architectures (SOA). In addition, working with Lotus Domino 8, Lotus Domino Designer 8 refines the native Web service

provider support first introduced in Lotus Domino 7, offering more options that allow other systems to make use of Domino data and business logic.

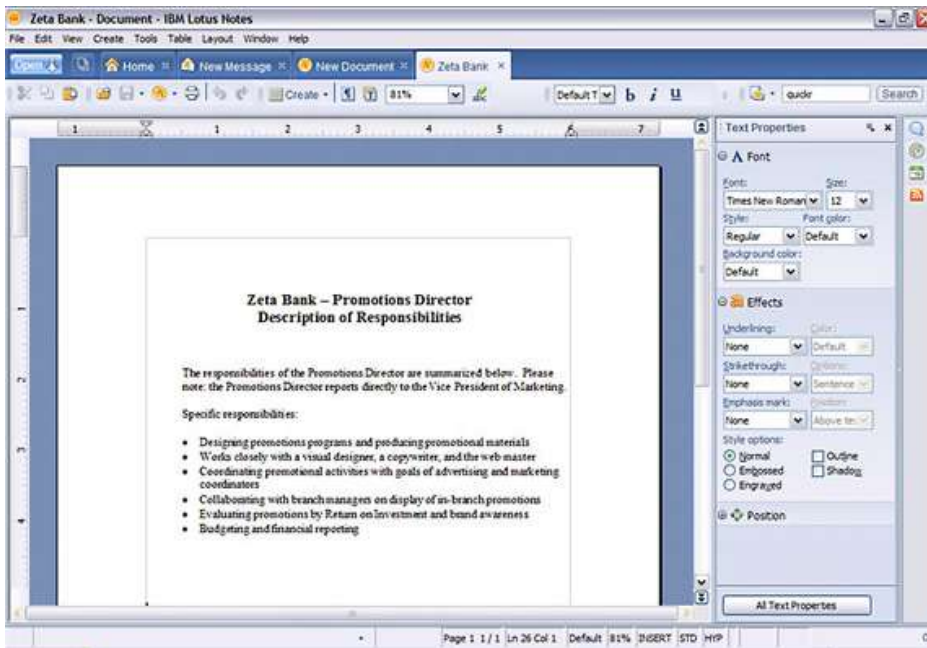
Working with composite applications in Lotus Notes and Domino 8 extends the "more, better, faster" model of previous releases. Lotus Notes and Domino 8 make it easy to integrate existing and new solutions and data into composite applications. These new applications aggregate components on the screen to present content from different systems -- Lotus Notes databases, Java applications, and the Web, for example -- to the user, all in a single context. See figure 9.

Figure 9. A composite application screen in Lotus Notes 8



The new productivity editors are applications for creating, editing, and sharing documents, presentations, and spreadsheets; they are also included in the standard Lotus Notes 8 license. The editors, closely integrated with Lotus Notes, support several file formats; their default is the same Open Document Format used by OpenOffice 2.0 and other products that are based on open-source code. Figure 10 shows a sample document.

Figure 10. The Lotus Document Editor



The release of Lotus Notes and Domino 8 completes a process that started in 2002 when IBM embraced standards-based computing. The latest versions of the product enhances the Lotus Notes user interface, offers activity-centric computing, and introduces composite applications.

Related topics

- Read the developerWorks Lotus article, "[What's new in IBM Lotus Notes and Domino V8.](#)"
- Read the developerWorks Lotus article, "[New features in Lotus Domino 7.0.](#)"
- Read the developerWorks Lotus article, "[New features in Lotus Notes and Domino Designer 7.0.](#)"
- Read the developerWorks Lotus article, "[New features in Notes/Domino 6.5.](#)"
- Read the developerWorks Lotus article, "[Domino 6 Technical Overview.](#)"
- Read the developerWorks Lotus article, "[Notes 6 Technical Overview.](#)"
- Read the developerWorks Lotus article, "[Domino Designer 6 Technical Overview.](#)"
- Read the developerWorks Lotus article, "[Notes R5 Technical Overview.](#)"
- Read the developerWorks Lotus article, "[Domino R5 Technical Overview.](#)"
- Read the developerWorks Lotus article, "[Domino Designer R5 Technical Overview.](#)"
- Get started with [IBM Lotus Notes and Domino V8 technical content.](#)
- Refer to the developerWorks Lotus [Composite Applications page.](#)

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