

Lotus. software



# Fundamentals of IBM® Lotus® Domino® 7 Application Development

*Student Guide*

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# Fundamentals of IBM® Lotus® Domino® 7 Application Development

Part Number: N7D510

Course Edition: 1.0

## ACKNOWLEDGMENTS

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### **Appendix A: Solutions to Practice Activities**

### **Appendix B: Certification and Exam Competencies**

# Course Description

The course provides the information that developers need to know to successfully create and modify database applications in IBM® Lotus® Domino Designer® 7. It provides an overview of the Lotus Domino 7 and Domino Designer 7 environments, introduces the elements and skills that are used in creating single-database Lotus Domino applications, describes how the formula language can be used to enhance the functionality of a Lotus Domino application, and explains how Lotus Domino applications can be secured.

This course extends participants' Domino application development skills by teaching them how to use the Domino tools to design and develop dynamic Web applications. Participants learn how to efficiently use Domino fields and page lay out design elements in the Web pages. They learn how to use JavaScript in their Domino application. Participants do not need to know how to program in this language to acquire an understanding of how and where to apply the programming capabilities to the best advantage. Finally, this course covers security topics specific to the Domino web environment.

## Audience

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The target audience for this course is application developers who are new to developing Lotus Domino applications and who need to acquire the fundamental skills to develop and modify single database applications in IBM Domino Designer 7.

## Course Prerequisites

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The prerequisites for this course include experience using the IBM Lotus Notes client, Web browser or both to access applications. Experience in developing one or more applications using other application development tools is recommended.

## Course Strategy

### Approach

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*Fundamentals of IBM Lotus Domino Designer 7* is the first course in the Lotus Domino 7 Application Development curriculum. This course takes four full days to deliver correctly. The intent of the design of this course is to give the students a solid foundation in designing and developing Lotus Domino applications. Students learn about working with the basic building blocks in a Lotus Domino application, and working with the Formula language. They also learn how to add to the basic building blocks with more advanced functionality such as automating the application and securing it. Finally, they learn how to manage an application in a production environment, and what they need to know, or be able to do, to deploy it.

### Scenario

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Worldwide Corporation is an international pottery manufacturer. The company sells ceramics worldwide. Products include tiles, china, and various kinds of pottery. The corporate office houses manufacturing, research and development, product management, quality control, human resources, and system administration. There are several smaller sales offices and resellers throughout each region, and some sales representatives work from their homes. The Policies and Procedures database that you will design and develop will contain corporate policies and procedures for Worldwide Corporation. It will also contain a discussion forum so that employees can ask questions about policies and procedures.

## How to Use This Book

### As a Learning Guide

---

Each lesson covers one broad topic or set of related topics. Lessons are arranged in order of increasing proficiency with Lotus Domino and Lotus Notes; skills you practice in one lesson are used and developed in subsequent lessons. For this reason, you should work through the lessons in sequence.

Each lesson is organized into results-oriented topics. Topics include all the relevant and supporting information you need to master Lotus Domino and Lotus Notes, and activities allow you to apply this information to practical hands-on examples.

---

## **As a Review Tool**

Some of the information covered in class may not be relevant to your Lotus Domino and Lotus Notes environment immediately, but it may become important later on. For this reason, we encourage you to spend some time reviewing the topics and activities after the course. The course can also be used in preparation for Lotus certification exams.

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## **As a Reference**

The organization and layout of the book make it easy to use as a learning tool and as an after-class reference. You can use this book as a first source for definitions of terms, background information on given topics, and summaries of procedures.

---

# **Machine Requirements**

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## **Hardware**

### **Primary Classroom Server**

The following list details the minimum hardware necessary for the setup of the primary classroom server:

- At least 512 MB of RAM per CPU. However, for optimal performance, you might need to use 1024 MB or more.
- A Pentium class (or higher) processor and compatibles. A Pentium 4, 2.6 GHz, processor is recommended.
- An SVGA (or better) video card and monitor. Support for 256 colors, 800 x 600 resolution.
- At least 1.6 GB (per partition) of free hard disk space. Forty GB of free disk space is recommended.
- For disk swap space, at least twice the amount of installed RAM.
- A mouse or other pointing device.
- A CD-ROM drive or access to a network file server for installation.

### **Optional Sametime Server**

The following list details the minimum hardware necessary for the setup of the optional Sametime server:

- At least 512 MB of RAM per CPU. However, for optimal performance, you might need to use 1024 MB or more.
- A Pentium class (or higher) processor and compatibles. A Pentium 4, 2.6 GHz, processor is recommended.
- An SVGA (or better) video card and monitor. Support for 256 colors, 800 x 600 resolution.
- At least 1.6 GB (per partition) of free hard disk space. Forty GB of free disk space is recommended.
- For disk swap space, at least twice the amount of installed RAM.
- A mouse or other pointing device.
- A CD-ROM drive or access to a network file server for installation.

### **Instructor and Student Clients**

The following list details the minimum hardware necessary for the setup of the instructor and student client computers:

- At least 128 MB of RAM, 1024 MB is recommended.
- A Pentium class processor.
- An SVGA (or better) video card and monitor. Support for 256 colors, 800 x 600 resolution.
- At least 275 MB of free hard disk space, 300 MB is recommended.
- A mouse or other pointing device.
- A CD-ROM drive or access to a network file server for installation.
- Synchronize system time with all classroom machines.

---

## **Software**

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### **Primary Classroom Server**

The following software is required for the primary classroom server. Please note that proper licensing for all software is required and is the responsibility of the training organization.

- Microsoft® Windows® Server 2003 (Standard or Enterprise Edition) (Service Pack 1 is not required but recommended) or Microsoft® Windows 2000 Server (or Advanced Server) with Service Pack 4.
- Lotus Domino Enterprise Server 7.

### **Optional Sametime Server**

The following software is required for the optional Sametime server. Please note that proper licensing for all software is required and is the responsibility of the training organization.

- Microsoft® Windows® Server 2003 (Standard or Enterprise Edition) (Service Pack 1 is not required but recommended) or Microsoft® Windows 2000 Server (or Advanced Server) with Service Pack 4.
- Lotus Domino Enterprise Server 7.
- Sametime Limited Edition.

### **Instructor and Student Clients**

The following software is required for the instructor and student client computers. Please note that proper licensing for all software is required and is the responsibility of the training organization.

- Windows XP Professional or Windows 2000 Professional, with all applicable Service Packs.
- Lotus Domino Administrator or Designer 7.
- Microsoft® Internet Explorer® 6.0 or above, with all applicable Service Packs.
- Sun Java Runtime Environment (JRE), Java 2 v1.4.2 or higher
- TCP/IP using either Hosts file or DNS with server and domain names defined in the TCP/IP protocol configuration.

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## **Course Icons**

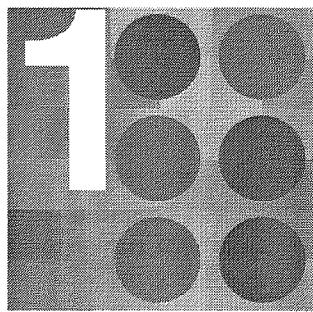
The following table explains the icons used in this course.

**Table 0-6: Course Icons**

<b>Icon</b>	<b>Description</b>
	Indicates an activity.
	Cautions are short, descriptive paragraphs meant to warn of potential pitfalls or areas where students could experience problems during class or back on the job.
	Indicates an Instructor demo. This text is visible only in the instructor guide.
	Instructor notes: Special notes the course developer want to communicate to the instructor regarding delivery, classroom strategy, classroom tools, exceptions, and other special considerations. These notes are visible only in the instructor guide.

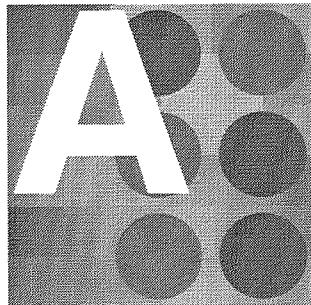
### Introduction

Icon	Description
	Indicates when to display a specific slide contained in the course PowerPoint file. These are visible only in the instructor guide.
	Indicates scenario information for an activity.
	A note or tip provides additional guidance, or a hint, for students about a topic or task.



## Exploring Applications in Lotus Domino 7

- **Topic A:** Identify Application Types and Data Sources
- **Topic B:** Examine the Lotus Domino Architecture
- **Topic C:** Examine Lotus Domino Application Components
- **Topic D:** Investigate Replication and Application Design Considerations
- **Topic E:** Extend Lotus Domino Collaboration Capabilities



## **Topic A: Identify Application Types and Data Sources**

After completing this topic, you should be able to:

- ✓ Describe what a Lotus Domino application is.
- ✓ Identify the types of applications you can create with Lotus Domino.
- ✓ Identify data sources for Lotus Domino applications.

### **Lotus Domino Applications**

IBM® Lotus Notes® and IBM® Lotus® Domino® are an integrated messaging and collaboration application software platform that provides a scalable and secure infrastructure with the flexibility and openness needed for development and deployment of Lotus Domino applications. An **application** is a solution to a particular problem that may include one or more databases and other components, such as Java applets.

### **Domino Application Types**

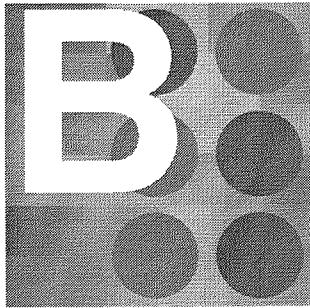
The following table describes the basic types of Lotus Domino applications.

<b>Application Type</b>	<b>Description</b>
E-mail/PIM (personal information management)	Synchronizes applications and mail, server-to-server and client-to-server communication, and mobile communication, and provides a calendar, task management features, a personal journal, and document libraries.
Broadcast/Reference	Acts as a repository for the distribution and easy lookup and search of information.
Tracking/Workflow	Provides a trail of, and prompts for, actions in a business process.
Discussion	Allows for layered conversation between workgroup members on specific subjects.
Front end	Allows access to large data stores of non-Lotus Domino data.

## **Data Sources**

Data sources for Lotus Domino applications include those listed in the following table.

<b>Data Source</b>	<b>Description</b>
Lotus Domino databases	Applications can be developed to work with data from a single Lotus Domino database or from multiple Lotus Domino databases.
DB2 relational databases	Lotus Domino 7 introduces the ability to utilize the DB2 relational database as an alternative storage mechanism for data. You can expose Lotus Domino data in DB2 views, making that data available to DB2 applications, including IBM® Workplace™ and WebSphere Portal applications. You can use SQL to build new Lotus Domino applications that blend collaborative services with relational data that is stored in DB2 databases.
Web services	Web services are technology that allows programming-independent and platform-independent communication between applications. The advantage of using Web services is that the technology is based on open standards such as Extensible Markup Language (XML) and Simple Object Access Protocol (SOAP). Web services can handle data more easily and allow a variety of software to communicate more freely than any one proprietary application or environment.



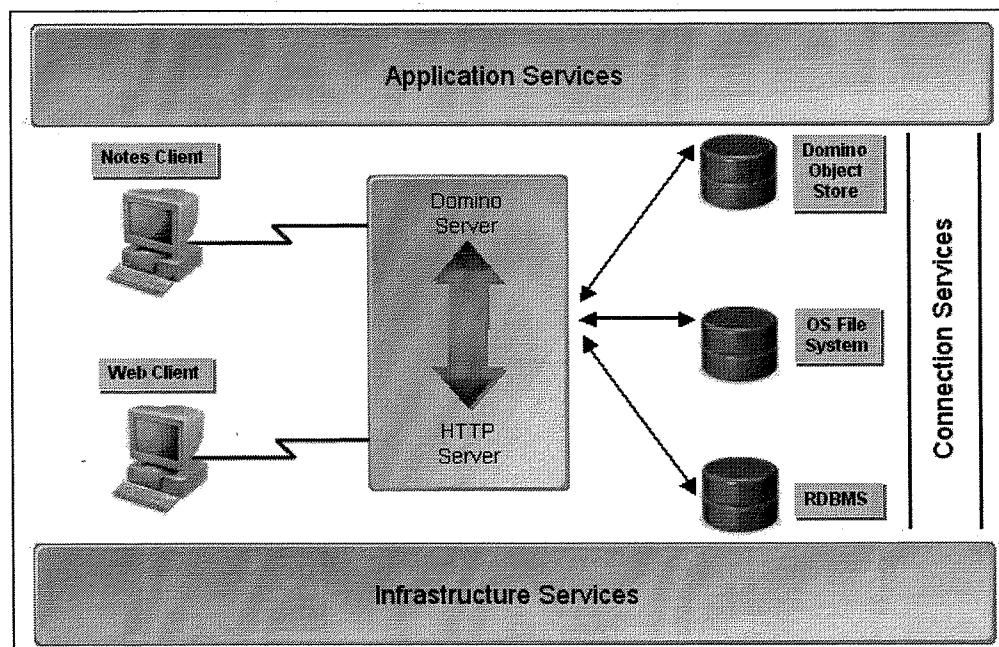
## Topic B: Examine the Lotus Domino Architecture

After completing this topic, you should be able to:

- ✓ Identify components of the Lotus Domino infrastructure.
- ✓ Describe the types of clients that can access Lotus Domino applications.
- ✓ Describe how Lotus Domino applications are accessed.
- ✓ Describe the structure of a Lotus Domino database.
- ✓ Identify ways to access the properties of documents.

### Lotus Domino Infrastructure

**Lotus Domino servers** work with **Lotus Notes clients** and non-Lotus Notes clients to form an integrated client/server environment. The Lotus Notes/Lotus Domino environment, as conceptualized in the following figure, provides services to allow an organization to store, communicate, and exchange information.



**Figure 1-1:** A conceptual diagram of the Lotus Notes/Lotus Domino architecture

A Lotus Notes/Lotus Domino environment consists of a combination of the following client/server components.

Component	Function
Lotus Domino server (Web-enabled)	A Lotus Domino server is a computer that runs the Lotus Domino server program and stores Lotus Notes databases. A Lotus Domino server runs services that manipulate Lotus Notes data. Depending on what the request is and who the client is, the server can pull information from a variety of sources, including the object store, the file system, a relational database, or a combination of all three.
Lotus Notes and Web clients	Lotus Notes clients can access Lotus Domino data both on servers and locally, providing portable access to data. Web clients can access Lotus Domino data on the server to display in a browser.



**Note:** You can also use a browser to access Lotus Domino data stored locally. For instance, a mobile user accesses Lotus Domino data with a browser instead of a Lotus Notes client. The database could still be replicated to the mobile user and he or she would access it via a browser.

## Clients

The following table outlines the Lotus Notes client types available with Lotus Domino servers.

Lotus Notes Clients	Function
Lotus Notes client	Allows users access to Lotus Notes databases on a Lotus Domino server, mail, and Web browsing.
IBM® Lotus® Domino Designer®	Supports the creation and development of Lotus Domino databases or applications. This client is not used to access mail.
IBM® Lotus® Domino® Administrator	Allows users with proper privileges to perform administrative tasks in a Lotus Domino environment. This client is not used to access mail.

The following table outlines the internet client types available with Lotus Domino servers.

## Topic B: Examine the Lotus Domino Architecture

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### Lesson 1 ■ Exploring Applications in Lotus Domino 7

Internet Clients	Function
IBM® Lotus Notes® Web Access	Provides on- or offline access to Lotus Domino core messaging, collaboration, and PIM functions through a Web browser.
Web client	Supports Lotus Domino applications, mail, and calendar access for Web browsers.
POP3 client	Allows mail access to a POP3-compliant server.
IMAP client	Supports mail access to an IMAP-enabled server.

### Application Access

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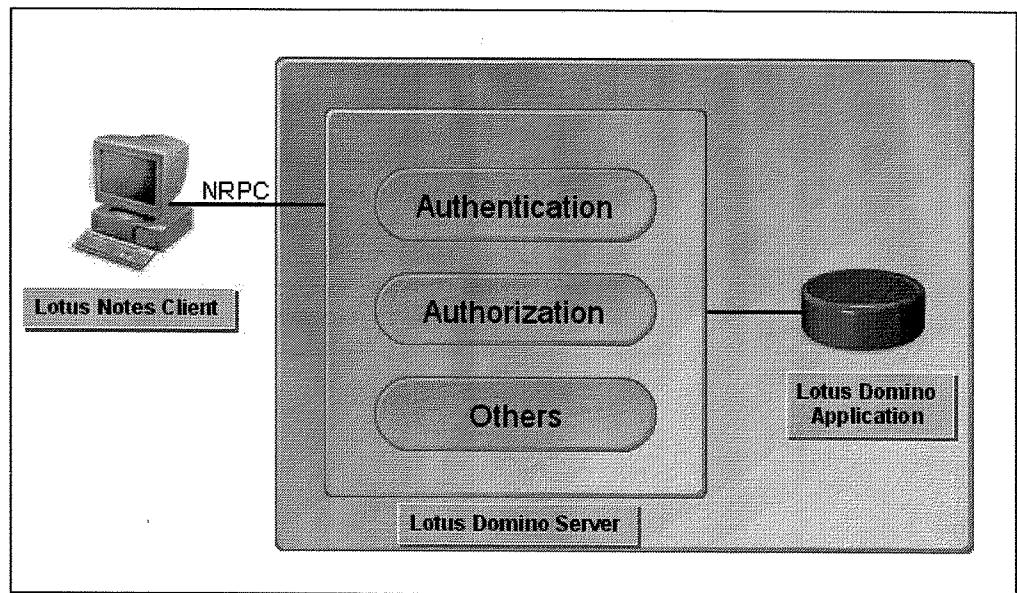
Lotus Domino applications are client-server applications. The client communicates with the application using a proprietary remote procedure call mechanism. The **Lotus Notes Remote Procedure Call (NRPC)** transmits the client request to the Lotus Domino application and returns the results. Lotus Domino authenticates users when they access applications on the server. Other Lotus Domino services are called upon depending on the specifics of the application.

## Accessing a Lotus Domino application with Lotus Notes

The following table describes the stages that occur when a user accesses a Lotus Domino application from a Lotus Notes client.

Stage	Description
1	User makes a request to open, read, or save data in the application.
2	Lotus Domino authenticates the user making the request and provides authentication information about itself to the user. This occurs when the client first accesses the server.
3	Lotus Domino verifies the rights of the user making the request. This occurs every time a request is made.
4	Lotus Domino executes the request and responds to the client.

This process is shown in the following figure.



**Figure 1-2: The Lotus Notes client accessing a Lotus Domino application**

## Working with local applications

A local database allows users to work offline (not connected to the network). Local databases can also be used to run personal applications that should not be available to multiple users. The Lotus Notes client provides a subset of Lotus Domino services to execute common functionality locally and

## Topic B: Examine the Lotus Domino Architecture

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reduce the load on the server. The client does not support the same level of security checks and restrictions that the server does. However, there are database properties that the developer can employ to enforce a certain level of security on applications that reside locally.

#### **Using a Web browser to access Lotus Domino applications**

Domino supports the HTTP protocol, which allows Web browsers to access applications on a Lotus Domino server. As with access using a Lotus Notes client, Lotus Domino authenticates users when they access applications on the server via a Web browser.

The following table describes the stages involved in accessing a Lotus Domino application through a Web browser.

Stage	Description
1	User makes a request to open, read, or save data in the application.
2	Depending on the server setup and the database ACL, Lotus Domino authenticates the user making the request and provides authentication information about itself to the user. If both server and database allow Anonymous access, no challenge is issued to the client and the user is not authenticated. The result is that the user is identified as Anonymous.
3	Lotus Domino verifies the rights of the user making the request.
4	Lotus Domino translates the HTTP request.
5	Lotus Domino executes the request.

## Lesson 1 ■ Exploring Applications in Lotus Domino 7

The following figure illustrates how a Web browser accesses a Lotus Domino application. In this example, data is also accessed from DB2.

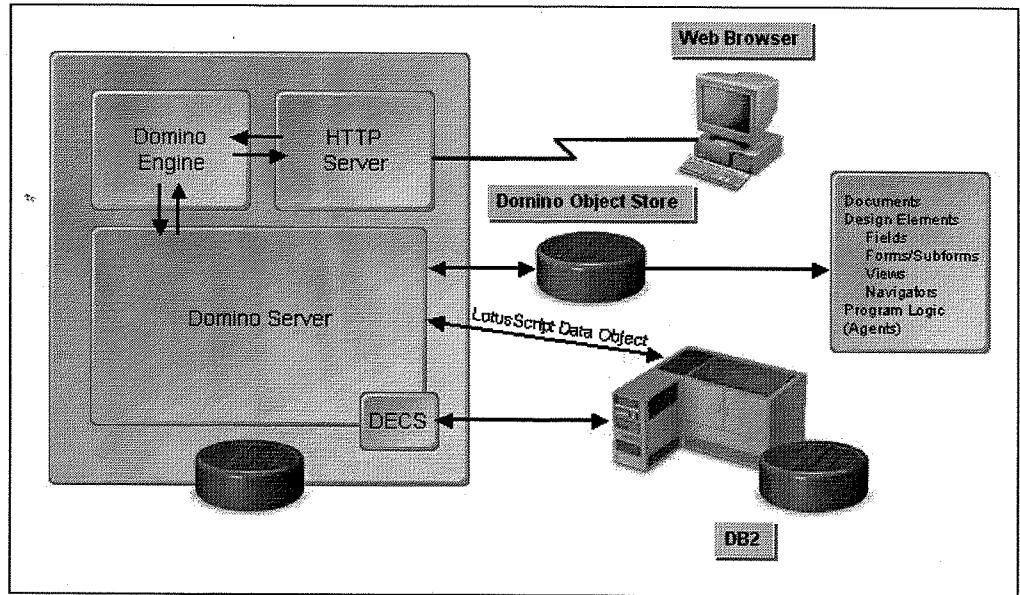


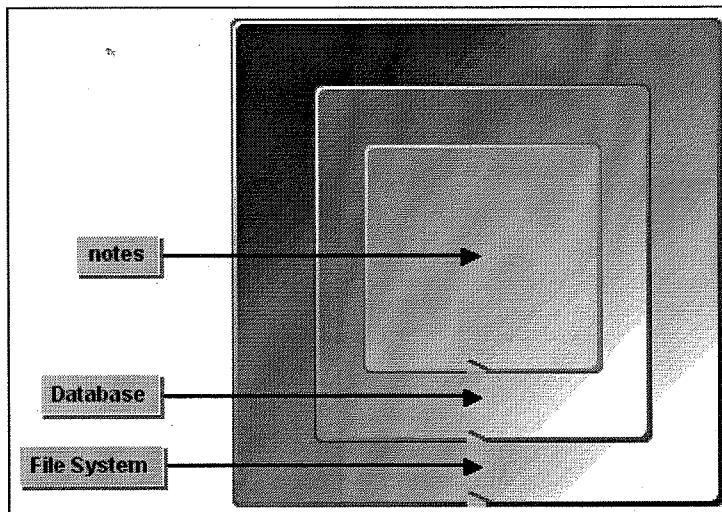
Figure 1-3: Accessing a Lotus Domino application through a Web browser

## Lotus Domino Database Structure

The foundation of the Lotus Notes and Lotus Domino design is the use of a single and simple data structure, called a note, to store all information. **Notes** are used to store data and design elements. Notes are described in more detail later in this lesson.

#### Lotus Domino database containment model

Lotus Domino databases are files that exist in the file system. Lotus Domino uses the path and file name to identify the database. Once the database is open, you access data by opening notes. This relationship, shown in the following figure, is described as a containment model. The file system contains databases, a database contains notes, and a note contains data.



**Figure 1-4:** The Lotus Domino database containment model

As the containment model shows, to access a database, you must first access the file system.

## The components of a Lotus Domino database

A Lotus Domino database contains two areas of functionality:

- **Notes Storage Facility (NSF)** maintains the data and design elements of the application.
- **Notes Index Facility (NIF)** builds and maintains lists for locating data in the application.

The following figure illustrates the components of a Lotus Domino database.

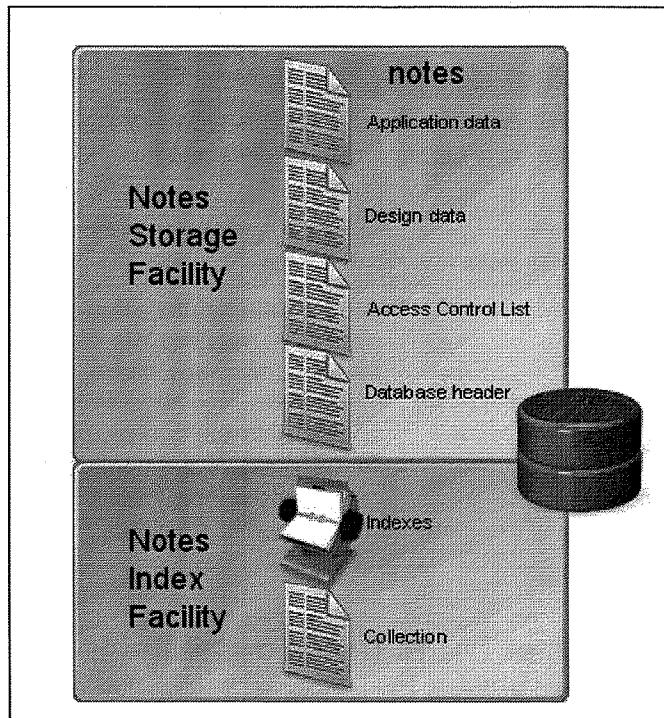


Figure 1-5: The two areas of Lotus Domino database functionality

### Lotus Notes and data storage

As stated earlier, the note is the data structure used to store all information in a Lotus Notes or Lotus Domino database. All notes in a database are essentially the same. They are peers to one another and do not share hierarchical or other relationships. Notes only differ in the data values they contain and how Lotus Domino uses them.

A note stores data in **items**. Each item is identified by a name and contains a list of values. The values in a single item must be of the same data type. Items also store information about the data. This **metadata** is available to the application and the Lotus Domino services. Metadata is, literally, data about data.



**Note:** Metadata describes how the data is formatted.

#### Note types

A Lotus Domino database contains database header, ACL, and design notes. It also contains data notes once the users of the database create them. Some notes are created by users and developers, and other notes are maintained by Lotus Domino to track and control information in the database.

Data is stored in a specific kind of note, referred to as either a **data note** or a **document**. Both terms are used interchangeably throughout this course. You can create and access documents in many ways.

#### Notes that developers create

The following table describes the types of notes that users and developers can create in a Lotus Domino database.

Type of Note	Purpose
Data	Stores data values used in the application. For example, a data note may contain customer profile information, such as the customer's name, address, and phone number.
Design	Stores data used to process or affect the presentation and functionality of the application. For example, a design note may contain instructions for how Lotus Domino displays information to a user.

#### Notes that Lotus Domino maintains

The following table describes other types of notes that Lotus Domino maintains.

Type of Note	Purpose
ACL	The ACL stores a list of names and options for controlling access permissions to the database.
Database header	Lotus Domino stores information about the database in a database header note. The database header contains information such as the version of Lotus Domino used to create the database, the title of the database, and the database ID.

## Access Document Properties

The Lotus Notes client provides users with the ability to examine documents through a Properties box. The Document Properties box, shown in the following figure, reads the contents of a document and displays information to the user.

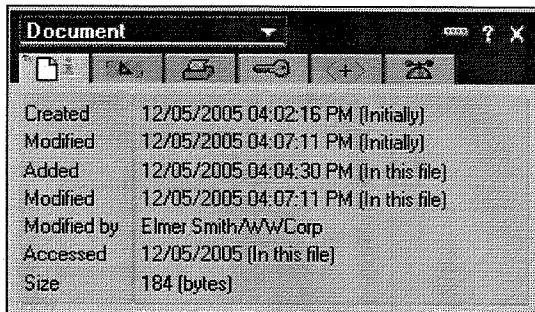


Figure 1-6: The Document Properties box

## Opening the Document Properties Box

Follow these steps to open the Document Properties box.

Task	Procedure
1	Open the database in the <b>Lotus Notes</b> client.
2	Select the document you wish to examine.
3	Open the Document Properties box. <ul style="list-style-type: none"><li>● Choose <b>File→Document Properties</b>.</li><li>● Right-click the document and choose <b>Document Properties</b>.</li><li>● Click the <b>Properties</b> button.</li><li>● Or, press <b>Alt+Enter</b>.</li></ul>
4	Use the tabs of the Properties box to view the structure of the data note.

## Properties boxes

All Lotus Domino elements have Properties boxes associated with them, from entire databases down to individual text elements.

**Examining a document through the Properties box**

The Properties box has several tabs that display different information about the document. The following table describes three of these tabs.

Tab	Information Displayed
Document Info	Data about the document that Lotus Domino maintains; for example: <ul style="list-style-type: none"><li>● When it was created.</li><li>● When it was last modified.</li><li>● Who last modified it.</li></ul>
Fields	A list of the items in the document and the data each item contains. Selecting an item in the left pane displays its value and metadata in the right pane. Metadata includes the data type and special flags Lotus Domino uses when dealing with this data.
Document IDs	The unique ID of the document.

**Other ways of accessing data**

Lotus Domino provides access to data in several ways, including:

- Fields on a form
- Columns in a view
- Programmatically, via any of the following:
  - Formula language
  - LotusScript®
  - JavaScript
  - Java
  - XML



**Note:** An overview of programming languages is provided later in the course.

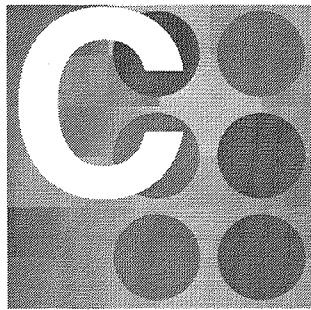


## Activity 1-1: Analyze Database Documents

In this activity, you will answer questions about the content of documents.

Step	Action
1	Open the <b>Lotus Notes</b> client.
2	Choose <b>File→Database→Open</b> .
3	For Server, select <b>Hub/WWCorp</b> .
4	In the Database list, scroll and double-click <b>Fundamentals</b> . 
5	Double-click <b>Instructor Demo</b> .
6	Click <b>Customers</b> to open the Customers view.
7	Choose <b>File→Document Properties</b> .

1. Who last updated the document?
2. When was the document created?
3. What is the data type for the **CustomerID** item?



## **Topic C: Examine Lotus Domino Application Components**

After completing this topic, you should be able to:

- ✓ Identify the characteristics of and uses for pages.
- ✓ Identify the characteristics of and uses for forms.
- ✓ Identify the characteristics of and uses for views.
- ✓ List navigation elements used in Lotus Domino applications.
- ✓ Identify that Lotus Domino provides mechanisms for automating tasks.
- ✓ Identify the security layers that protect Lotus Domino applications.

### **Pages**

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**Pages** contain text, images, applets, and other objects. Users do not enter information on pages. You can use pages to display and organize information.

### **Forms**

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**Forms** contain fields where users can enter values. Those values are stored in documents. You can use forms to gather information.

### **Page and form comparison**

Pages and forms are similar in many ways. Both display and organize information, and both share many elements. However:

- Pages do not contain fields, so they cannot collect or calculate data.
- Users cannot create pages. Only developers can create pages.

### **Views**

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**Views** index and display lists of documents contained in an application. You can use views to organize information.

### **Navigation**

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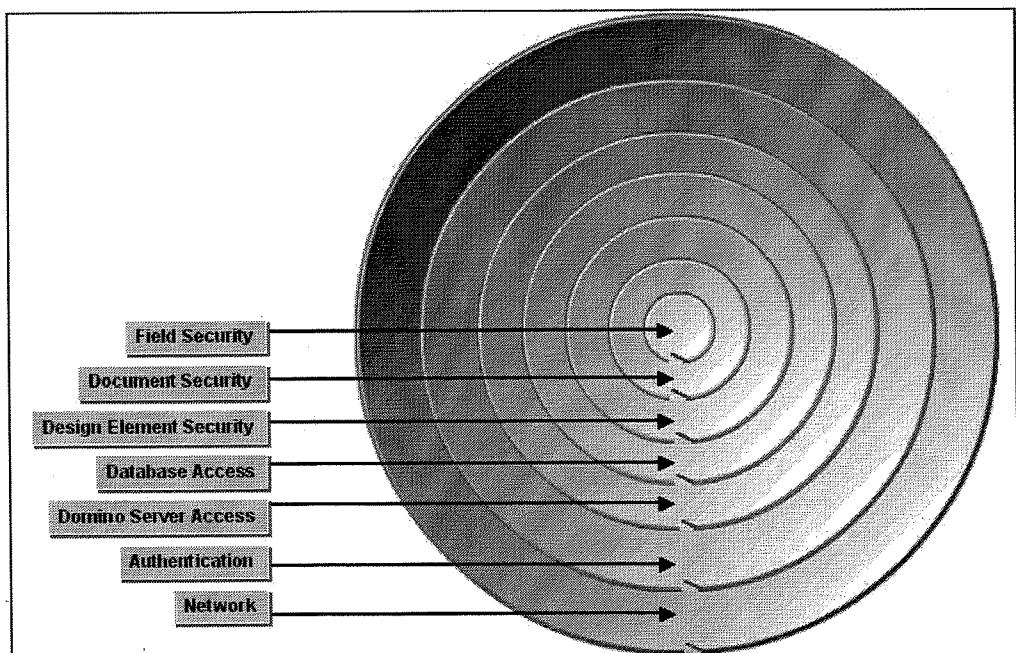
Hotspots, framesets, outlines, and image maps are the most common navigation elements used in Lotus Domino applications. You can use these elements in conjunction with each other to enable users to move around the application quickly and easily.

## Task Automation

Lotus Domino provides a number of elements for automating tasks such as actions. **Actions**, which can appear in views, documents, pages, and the Action menu, trigger tasks such as creating or saving a document. The Create menu also contains elements that can run a script when a user selects it; for example, Memo in the mail database to create a new memo. Some tasks are triggered automatically without user intervention, such as a nightly backup.

## Security Layers

Lotus Domino's layered security model, shown in the following diagram, provides increasing refinements to the security of the network, the Lotus Domino server, applications, and elements within each application.



**Figure 1-7: Lotus Domino's layered security model**

Each of the layers in the model is described in the following table.

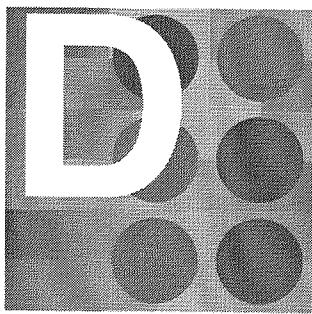
Layer	Description
Network	This refers to access to the server over the wire.
Authentication	The process of establishing "trust" between the server and that which is trying to access the server.

## Topic C: Examine Lotus Domino Application Components

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### Lesson 1 ■ Exploring Applications in Lotus Domino 7

Layer	Description
Domino Server Access	This refers to the restrictions available in the server's Server document.
Database Access (ACL)	This refers to the levels of access controlled by the Access Control List (ACL) in a specific database.
Design Element Security	This refers to anything from reading access lists to controlling who can see a particular design element based on who they are.
Document Security	This refers to <b>Readers</b> and <b>Authors</b> fields, which restrict access to specific readers and authors.
Field Security	This refers to encryption. Note that the field on the form is where encryption is enabled. It is actually the data stored in the document that is encrypted.



## Topic D: Investigate Replication and Application Design Considerations

After completing this topic, you should be able to:

- ✓ Describe the replication process.
- ✓ Describe the considerations involved in replicating applications.

### Replication

**Replication** is the process of synchronizing multiple instances, or copies, of a database on multiple servers and workstations. Running separate instances of a database on multiple workstations provides two benefits:

- It allows developers and administrators to distribute applications across geographic locations for faster access.



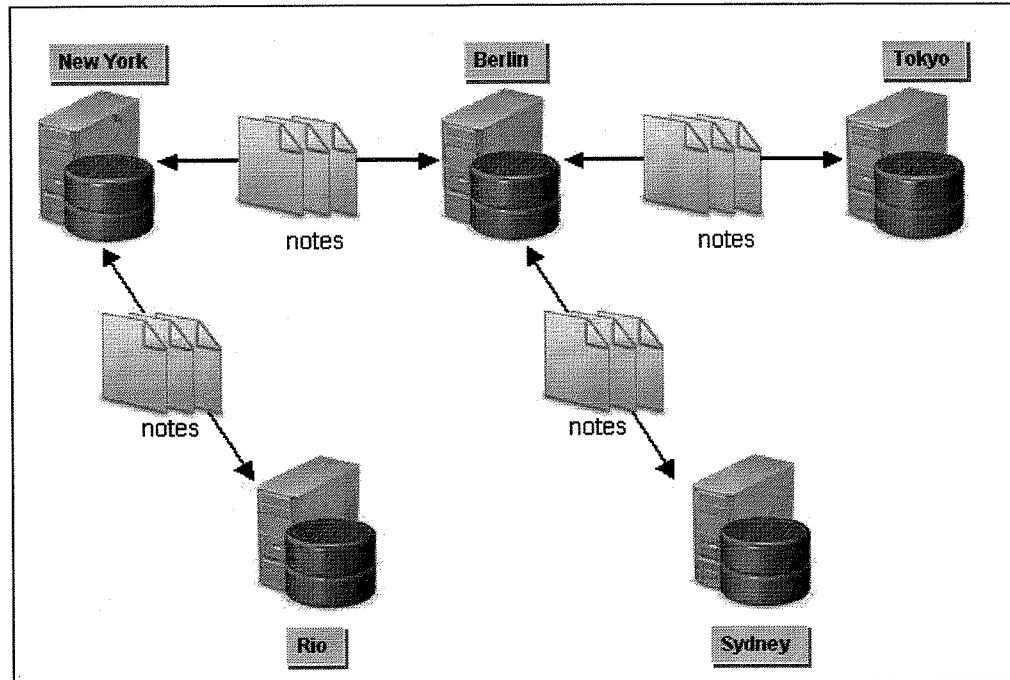
**Note:** Distributing applications also minimizes traffic across slower network segments and balances server loads.

- It allows users to work with an application offline, and then add (or replicate) their changes when reconnected to the network.

### Lesson 1 ■ Exploring Applications in Lotus Domino 7

#### The Lotus Domino replication service

The Lotus Domino replication service transfers new and modified notes between databases. The following figure illustrates the concept of replication.



**Figure 1-8: Replication**

### **Replica databases**

**Replica databases** are databases that share the same replica ID. The replica ID is generated automatically when a database is created. Replication can only occur between Lotus Domino databases that have the same replica ID. The names of two database replicas can be different, and they can contain different documents or implement different designs. However, if their replica IDs are the same, they can replicate with each other.

### **What happens during replication**

Replication is initiated by a Lotus Domino server or a user in the Lotus Notes client. Note that the server does not initiate replication with a workstation. During the replication process, the two servers (or the client and server) do the following:

- Authenticate with each other.
- Build a list of document, design element, and ACL changes since the last replication.
- Transfer the changes to the replica databases. Lotus Domino only replicates the items that have changed, not the entire document or design element. Before the servers transfer changes, they check the ACL of the replica databases. Lotus Domino can only transfer those changes permitted by the ACL.

### **Data that does not replicate**

The following data does not ever replicate:

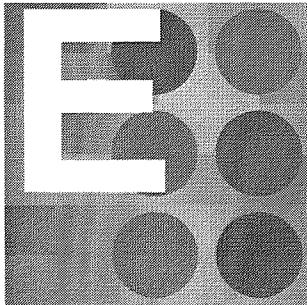
- View and FullText indexes
- File system information (for example, the database file name and path)

## Replication Considerations

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Some of the things you should take into account when considering replication include:

- Security settings can cause two people to see different elements in the same application. For example, if users are not allowed to read a specific type of document, then those documents are not visible to those users when they replicate the application.
- Servers that are doing the replicating must have access to the application elements. There are different levels of control on this.
- Frequency and timing of replication should be driven by the business need and application design. Additions and deletions of data affect business, and replication affects what users see in the different replica copies. When performed too infrequently, replication can result in reappearance of deleted data as well as information not being shared.
- Frequency of replication will affect network traffic.
- The timing of replications can create a situation where the data that one user sees is not the same as what another user sees. Therefore, if the data is time-critical, replication must happen more frequently. This, in turn, will impact network traffic.
- Multiple users can simultaneously edit the same document in one copy of a database or edit the same document in different replicas between replication sessions. When these situations occur, Lotus Domino stores the results of one editing session in one document and stores the results of additional editing sessions as individual documents that are named Replication or Save Conflict. In most cases, you will want to reconcile the differences between the original document and its conflict document(s) by editing one, and then deleting the other(s).



## Topic E: Extend Lotus Domino Collaboration Capabilities

After completing this topic, you should be able to:

- ✓ Identify Lotus Domino extended products.
- ✓ Describe how you can extend your Lotus Domino applications within the IBM Workplace environment.
- ✓ List other products and technologies that extend your Lotus Domino applications.

### IBM Lotus Domino Extended Products

IBM offers a family of products that extends and enhances the value of your Lotus Domino environment to increase organizational productivity and responsiveness through business-critical collaboration solutions. This family of product is often referred to as **extended products**. The following table describes the Lotus Domino extended products.

Product	Description
IBM® Lotus® Sametime®	Provides a combination of instant messaging and Web conferencing capabilities.
IBM® Lotus® Sametime® Enterprise Meeting Server	Can be added to a Lotus Sametime deployment (in a Windows environment) to support high-volume Web conferencing environments, as well as to optimize load balancing and failover for enterprise-class deployments.
IBM® Lotus® Domino® Document Manager	Manages the complete life cycle of office documents, from collaborative authoring to archival. It allows teams to work together more effectively through collaborative document management.
IBM® Lotus® QuickPlace®	Lets users instantly create a team workspace to gain access to timely information and to seamlessly bring together geographically and organizationally dispersed team members.
IBM Lotus Workflow	Works on top of Lotus Domino and speeds the creation and deployment of workflow-oriented applications. It allows organizations to standardize and streamline time-consuming, people-based activities, and track their progress.



**Additional Information:** For more detailed information on this family of products, visit <http://www-306.ibm.com/common/ssi/fcgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS205-199&appname=USN>.

## **IBM Workplace**

IBM® Workplace™ is a family of products, solutions, and technologies used for creating innovative, adaptive work environments based on users' roles or skill levels, or both. The IBM Workplace family includes:

- Portal technology
- Collaboration tools
- Content management tools
- Development tools
- Workflow capabilities
- Solutions on which a user's workspace is built

The following table describes some of the IBM Workplace products.

Product	Description
IBM® Workplace Managed Client™	Delivers fully integrated, server-managed collaboration to the end user's desktop. The Lotus Notes application plug-in allows users to run native Lotus Notes applications within the context of the IBM Workplace Managed Client product.
IBM® Workplace® Collaboration Services	Provides a full range of integrated, ready-to-use communication and collaboration tools. The Lotus Notes application plug-in allows you to extend the reach and viability of those applications to an IBM Workplace Collaboration Services environment and enables the integration of Lotus Notes applications with the instant messaging capabilities of Workplace Collaboration Services software.
IBM® Workplace™ Services Express	Provides a collaborative environment that can run on a single server. Users can create, edit, and share information and documents, whether they use Microsoft Windows, Linux, Microsoft Office, i5/OS, or a Web browser.

Product	Description
IBM® WebSphere® Portal	Enables the development and deployment of service-oriented applications. You can extend the reach of your existing Lotus Domino applications to IBM WebSphere Portal software by using portlets. Prebuilt portlets include Portlet Builder for Lotus Domino (part of the WebSphere Portal Application Integrator package), Lotus Notes and Domino and Extended Products Portlets, Lotus Domino Application Portlet, and Common Personal Information Management Portlets in WebSphere Portal Version 5.1.



**Additional information:** For more detailed information on this family of products, visit <http://www-306.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS205-204&appname=USN>.

## Other Products and Technologies

There are other products and technologies that can extend Lotus Domino applications. These services are described in the following table.

Product	Description
Lotus® Domino® Web Access 7	The first IBM messaging client to run on the Mozilla Foundation's Firefox 1.0.x browser and the Mozilla 1.7.x browser. This expands IBM's Linux offering and meets the growing demand for additional client options for Linux desktop users. In addition to creating and verifying digital signatures, Lotus Domino Web Access 7 provides S/MIME support for reading and creating security-rich, encrypted mail.
Lotus® Domino® Access for Microsoft Outlook	Delivers Lotus Domino services to Microsoft Outlook users. Organizations currently using Microsoft Exchange for their messaging infrastructure can move to security-rich, scalable, reliable IBM Lotus Domino server software, without changing from familiar client software on the desktop and without having to retrain users.

## Topic E: Extend Lotus Domino Collaboration Capabilities

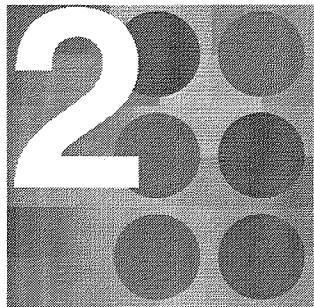
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Product	Description
Native Web Services	Hosting environment based on Simple Object Access Protocol (SOAP). You can use Web services to integrate your applications with J2EE and Microsoft .NET environments, often with less time and effort, and using existing skills.
Microsoft® Office®	Provides integration with Microsoft Office 2003 or Office XP software. Users of Microsoft software can access Lotus Notes Mail® using Smart Tags, a Microsoft Office capability, to recognize certain types of text, such as proper names.
Lotus® Domino® Unified Communications	Unified Messaging represents the convergence of voice mail, e-mail, and fax so that all messages are stored in a single location and can be accessed from a variety of devices, including telephones and PCs. Unified Communications (UC) takes Unified Messaging a step further by extending message access to additional devices and technologies, such as mobile phones, pagers, PDAs, and browsers. In addition, UC provides notification features that will alert subscribers in different ways when they receive a message that meets certain criteria.



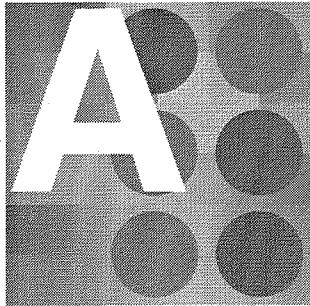
**Additional Information:** More information about these products is available online.

- For Lotus Domino Web Access 7, visit <http://www.lotus.com/products/product1.nsf/wdocs/webaccesshome>.
- For Lotus Domino Access for Microsoft Outlook, visit <http://www.lotus.com/products/product1.nsf/wdocs/accessmsoutlookhome>.
- For Lotus Domino Unified Communications, visit <http://www.lotus.com/products/product4.nsf/wdocs/ducshomepage>.
- For messaging in general, visit <http://www-142.ibm.com/software/sw-lotus/lotus/offering1.nsf>.



## **Exploring the Lotus Domino 7 Design Environment**

- **Topic A:** Explore the Lotus Domino Designer User Interface
- **Topic B:** Access Design Elements



## Topic A: Explore the Lotus Domino Designer User Interface

After completing this topic, you should be able to:

- ✓ Identify ways to open Lotus Domino Designer.
- ✓ Explore the Lotus Domino Designer user interface.

### Opening Lotus Domino Designer

IBM® Lotus® Domino Designer® is the development environment used to build IBM® Lotus® Domino® applications. Lotus Domino Designer contains the tools necessary to create powerful Lotus Domino applications. To access the design of a database, open that database in Lotus Domino Designer.

There are different ways to open Lotus Domino Designer:

- Double-click the **Lotus Domino Designer** icon on your desktop.
- Choose **Start→Programs→Lotus Applications→Lotus Domino Designer**.
- Click the **Designer** icon from within the IBM® Lotus Notes® client.
- Choose **View→Design** from a database open in the Lotus Notes client. If you do not have the access rights to modify the design of a database, the **Design** option is not available in the **View** menu.

### Opening a database in Lotus Domino Designer

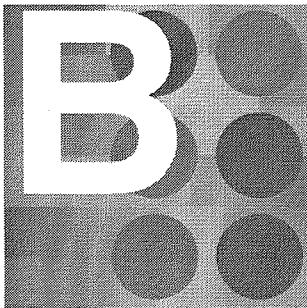
To open a database in Domino Designer:

Task	Procedure
1	Open <b>Lotus Domino Designer</b> .
2	Choose <b>File→Database→Open</b> .
3	In the <b>Server</b> field, enter the location of the application (server name or local).
4	In the <b>Database</b> field, select the database from the list, or enter it in the <b>Filename</b> box (directory and file name).
5	Click <b>Open</b> .

## Identifying the Areas of the Design User Interface

When you open a database in Lotus Domino Designer, the first level of the design environment opens. The following table describes several areas in this environment.

Area	Description
Design pane	Includes the <b>Design list</b> for the database. This consists of the list of design elements and the <b>Design bookmark icons</b> , which point to the most recent databases on which you have worked.
Work pane	Lists everything in the current database for the selected design element. Across the top of the Work pane are <b>Design action buttons</b> , which perform actions on the currently displayed elements (such as creating a new form).
Window tabs	Each item that you are currently working on has its own tab that, when clicked, takes you to the window that the tab represents.



# Topic B: Access Design Elements

After completing this topic, you should be able to:

- ✓ Identify the design elements and the tasks they support.
- ✓ Explore the different design elements in Lotus Domino Designer.

## Design Elements

Lotus Domino Designer includes structures called **design elements**, which are the building blocks for applications. You can customize these structures to create applications.

The following table summarizes tasks you might want an application to perform and the corresponding Lotus Domino design element or elements you could use to implement them.

Application Task/Functionality	Design Elements
Display, gather, and organize information	<ul style="list-style-type: none"><li>● <b>Pages</b> contain text, images, applets, and other objects. Users cannot enter information into pages.</li><li>● <b>Forms</b> contain fields where users can enter values. The values are stored as a <b>document</b>.</li><li>● <b>Views</b> index and display lists of documents contained in the application.</li></ul>
Automate tasks	<b>Actions</b> and <b>agents</b> can run scripts. They can be triggered programmatically or manually.
Control navigation	<b>Hotspots</b> , <b>framesets</b> , <b>outlines</b> , and <b>image maps</b> , when used in combination, allow users to move around the application quickly and easily.

## Access control and programming

Design elements are one piece of a Lotus Domino application. The following table describes two other pieces.

To...	Use...
Automate Tasks	Programming languages, which enable you to: <ul style="list-style-type: none"> <li>● Calculate or modify information.</li> <li>● Validate inputs before saving.</li> </ul>
Control access to information in the database	The <b>Access Control List (ACL)</b> and other elements, which identify the users who can: <ul style="list-style-type: none"> <li>● Create, read, and modify data.</li> <li>● Change the design of the application.</li> </ul>

## Accessing Design Elements

When you click a design element in the Design list, all the individual, database-specific elements of that type are listed in both the Design pane and the Work pane. The following figure shows the design environment of Lotus Domino Designer. To open an individual design element, double-click the element in the Design pane or Work pane. The element then opens in the Work pane, typically with the Programmer's pane below it.

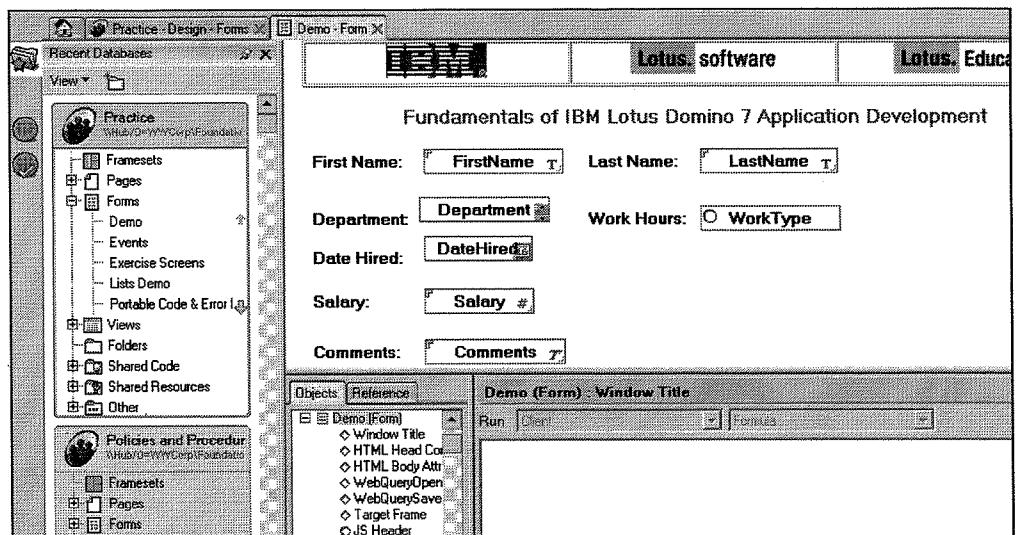


Figure 2-1: The design environment of Lotus Domino Designer

### Using the Work pane

The Work pane is used for creating and modifying forms, pages, views, and other elements in the Design list that are specific to your application or database. When you open or create an individual design element, Lotus Domino Designer automatically displays that element in the Work pane.

### Using the Programmer's pane

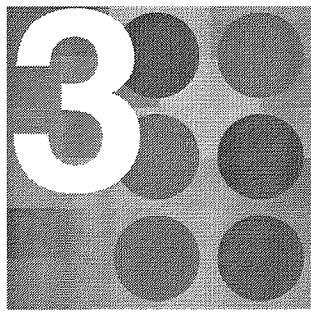
Use the Programmer's pane to add code in areas of the design element currently displayed in the Work pane. The following table describes the components of the Programmer's pane.

Component	Function
Objects tab	Lists all areas (objects and events) in the current design element where you can add code. Code is added in the Script area. When you click an item on the Objects tab, the Script area changes to show the code that describes the object. The Reference tab reflects the language or languages that you can use in the Script area.
Reference tab	Lists fields and functions that can be used to write code for the object. Designers can paste from the list or from the context-sensitive Help into the Script area.
Script area	Used to write code for the element selected using the Objects tab.

### Lotus Domino Designer references

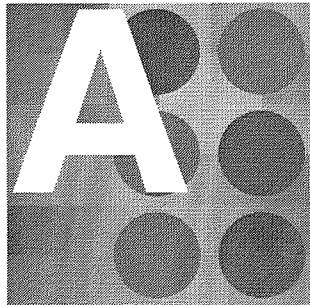
General and context-sensitive Help is available to assist you in working with Lotus Domino Designer. The following table describes different ways of getting help in Lotus Domino Designer.

Resource	Function	How to Open
Lotus Domino Designer Help	Provides details on: <ul style="list-style-type: none"><li>Using Lotus Domino Designer</li><li>Designing Lotus Domino applications</li></ul>	Choose Help→Help Topics.
Context-sensitive Help	Provides details on the specific element you are working with.	Press F1, or click the Context-sensitive Help icon



## Creating Databases

- **Topic A:** Create a New, Blank Database in Lotus Domino Designer
- **Topic B:** Create a Copy of an Existing Database
- **Topic C:** Create a Database from a Template
- **Topic D:** Organize the Lotus Domino Designer Environment



## Topic A: Create a New, Blank Database in Lotus Domino Designer

After completing this topic, you should be able to:

- ✓ Identify ways to create a database.
- ✓ Describe the options in the New Database dialog box.
- ✓ Create a new, blank database in Lotus Domino Designer.

### Database Creation Options

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You can create an IBM® Lotus® Domino® database in the following ways:

- Create a database from a template.
- Create a new, blank database.
- Copy an existing database.

During this course, you will use all three methods.

### Templates

A **template** is a database that contains the structure for a particular application, but does not contain any data. Lotus Domino includes a number of standard templates that let you easily set up a discussion database, a personal journal, or a collaborative team database.

You will work with templates later in the course.

## The New Database Dialog Box

When you create a database from scratch, you need to enter information and select options from the New Database dialog box, as shown in the following figure. In the top section, you specify the database's title, name, and location, whether or not encryption needs to be enabled, whether a full text index should be created, and what advanced database options should be enabled. In the lower section, you specify the template that should be used.

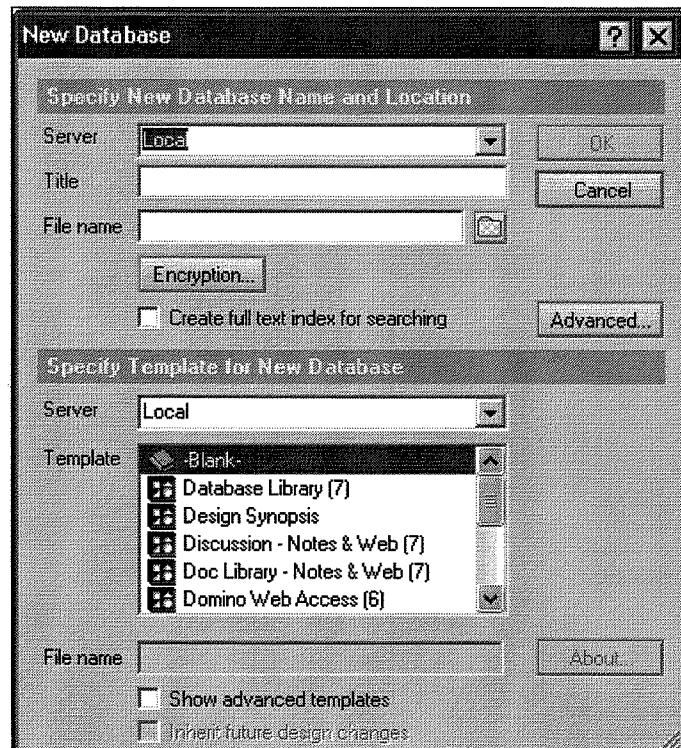


Figure 3-1: The New Database dialog box

### Creating a new, blank database

A blank database contains no design elements, such as pages or forms. Blank databases have one default view.

To create a new, blank database:

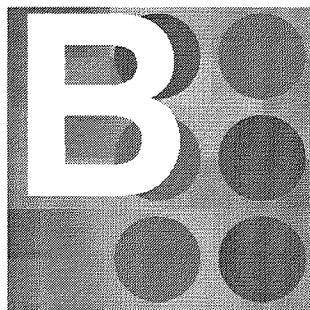
Task	Procedure
1	Choose <b>File</b> → <b>Database</b> → <b>New</b> . The <b>New Database</b> dialog box appears.
2	Accept the default of <b>Local</b> to create the database on your local computer.
3	Enter a title for the database.

## Topic A: Create a New, Blank Database in Lotus Domino Designer

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### Lesson 3 ■ Creating Databases

Task	Procedure
4	Enter a file name for the database.
5	From the template list, select <b>Blank</b> .
6	Click <b>OK</b> .



## Topic B: Create a Copy of an Existing Database

After completing this topic, you should be able to:

- ✓ Describe considerations related to creating databases from copies.
- ✓ Create a new database by copying an existing database.

### Creating Copies of Databases

A Lotus Domino database can be copied along with all existing design information. If the database designer has hidden the design, you cannot modify the design elements in the copy of the database. To check whether or not this is the case, view the **Design** tab in the **Database Properties** box and verify that **No design information available** is displayed.



**Tip:** After copying the design of an existing database, the manager of the database copy needs to create a new full-text index. For information on creating a full-text index for a database copy, see Lotus Domino Administrator Help.

### Copying a database

To copy a database:

Task	Procedure
1	Open the database to copy.
2	Choose <b>File→Database→New Copy</b> .
3	In the <b>Server</b> field, do one of the following: <ul style="list-style-type: none"> <li>● To store the new database on your local hard drive, leave <b>Local</b> selected.</li> <li>● For new databases that multiple people will be designing, select or enter a server name to store the new database on a server.</li> </ul>
4	If desired, in the <b>Title</b> field, enter a title for the new database. The title can have a maximum of 96 characters.
	<b>Note:</b> IBM® Lotus® Domino Designer® automatically gives the copied database the same title and file name as the original database. You have the option to change it. The length limit of the database's file name depends on your operating system. The copied database file name must end with the .nsf file extension. If the database will be used as a template, use the file extension .ntf.

## Topic B: Create a Copy of an Existing Database

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### Lesson 3 ■ Creating Databases

Task	Procedure
5	In order to copy just the design and not the documents within the database, select <b>Database design only</b> .
6	Deselect <b>Access Control List</b> so that the original database's ACL will not be copied to your new database.
7	Click <b>OK</b> .
8	If necessary, to prevent the copied database from inheriting future template design changes, choose <b>File→Database→Properties</b> , select the <b>Design</b> tab, and deselect <b>Inherit design from template</b> .