Microsoft
Technology Associate

MICROSOFT TECHNOLOGY ASSOCIATE

Student Study Guide

EXAM 98-363
Web Development Fundamentals

Microsoft

Preparing for MTA Certification

MICROSOFT TECHNOLOGY ASSOCIATE (MTA)
STUDENT STUDY GUIDE FOR DEVELOPERS

98-363 Web Development Fundamentals

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Contents

Introduction

MTA validates building-block technology concepts and helps students explore, discover and pursue successful careers in Information Technology (IT) in an exciting and rewarding way! As the first step in the Microsoft Technology Certification Series, this new, entry-level certification provides students with confidence, credibility, and differentiation.

Explore IT career options without committing a lot of time and resources MTA exams validate the core technology knowledge that is in demand today by businesses around the world. Whether you want to explore becoming a network administrator, software engineer, web developer, or database analyst, MTA gets you started on the right path.

Prepare to compete A little investment in IT can go a long way in today's job market. Becoming MTA certified helps you build a solid foundation to prepare for intermediate technology studies and for Microsoft Certified Technology Specialist (MCTS) certifications. It can also help you compete on college admissions and jumpstart your IT career planning!

Empower yourself As the first step toward becoming an MCTS, MTA shows your commitment to technology while connecting you with a community of more than five million Microsoft Certified Professionals. Learn from them and show them what you know by becoming MTA certified!

This MTA Student Study Guide serves as a study tool to help students prepare for their MTA certification exam. Students are challenged with real-life situations for each of the major topics covered in the exam. Although successful completion of the study guide exercises does not guarantee that you will pass your MTA exam, it is an excellent way to gauge your readiness to take the exam and build confidence that you know your stuff on exam day.

I wish you all the best as you prepare for a successful career in technology!

Victoria Pohto

Victoria Pohto
MTA Product Marketing Manager

Career Planning

Most IT solutions or infrastructure built on Microsoft technologies require proficiency with one or all of the following products, often referred to as "The Microsoft Stack."

- Microsoft Windows® Server® as the data center or development platform
- Microsoft SQL Server® as the data and business intelligence (BI) platform
- Microsoft Visual Studio® as the suite of application life-cycle management tools

MTA is the starting point of Microsoft technology certifications, providing aspiring technologists with the fundamental knowledge essential to succeed with continued studies and a successful career with technology.

Preparing for and becoming MTA certified helps you explore a variety of career paths in technology without investing a lot of time and money in a specialized career path. When you find a path that is right for you, Microsoft learning products and certification can help you prepare and guide your longer-term career planning.

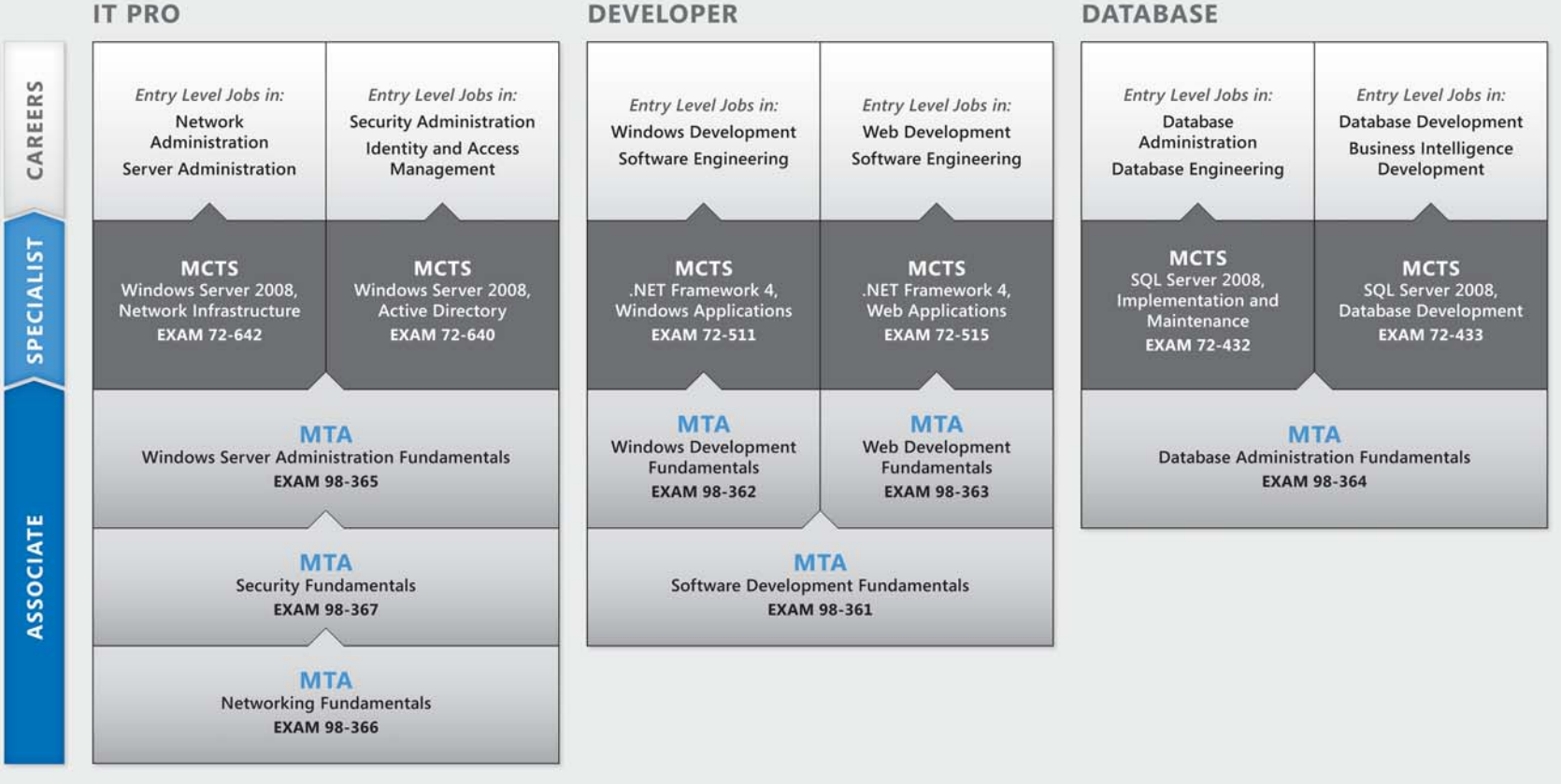
If you already know that you want to start building a career in technology, MTA preparation and certification is the recommended entry point. Becoming MTA certified shows that you have a firm working knowledge of the fundamental IT concepts critical for success with intermediate learning and certifications such as Microsoft Certified Technology Specialist (MCTS). Moreover, Microsoft certifications demonstrate an individual's commitment of self-investment and confidence to take his or her knowledge and skills to the next level with an industry-recognized credential.

MTA is not a "career certification," meaning that employers recognize you as "job ready," but it is the first step toward that career goal and can help differentiate you for an internship or to college admissions committees. As you prepare for your first job focusing on technology, be sure that you are equipped with an MCTS credential—the intermediate level certification that validates Microsoft product and technology skills.

The MTA Certification path on the next page shows you the MTA exams that are recommended prior to taking on some of Microsoft's intermediate technology certification, MCTS.

Microsoft Technology Associate Certification Paths

MTA is the recommended first step in the Microsoft IT Certification Program, and does not require pre-requisite exams. MTA certifications are not a pre-requisite for MCTS exams. *One MTA exam = One certification.*



For full Microsoft Certification roadmaps, visit **http://www.microsoft.com/learning/certification**

Exploring Job Roles

Choosing a career path is a big decision and it's not always easy, but you're not alone! Microsoft created a career site to help students understand the options and possibilities of pursuing a career in IT. The site also connects you with learning resources, student techie communities, and much more to help you prepare for a career in technology.

To chart your career with Microsoft technology, visit *www.microsoft.com/learning/career/en/us/career-org-charts.aspx*.

Database Administrator

As a database administrator, you are in charge of important databases that span multiple platforms and environments. You are a strong team player who thrives in a fast-paced environment. You build complex, highly scalable databases that meet business needs and security requirements. You are an expert in optimizing, maintaining, and troubleshooting databases, but also in designing archival, data distribution, and high-availability solutions.

Server Administrator

As a server administrator, you are in charge of implementing and managing some of the most important technology in your organization—the servers. You use extensive monitoring and profiling tools to manage the network and tune systems so they perform at optimal levels. You are an expert in Active Directory®, and you have an in-depth understanding of network protocols, and file and directory security.

Computer Support Technician

Consider starting your IT career by becoming a consumer support technician. You don't need any formal work experience, but a company might require that you know how to install, administer, and troubleshoot operating systems in a home network environment that has desktop computers, laptops, and printers. As a consumer support technician, you'll also handle network, virus, malicious software, and hardware support issues. You'll typically find this position in small to medium-sized organizations.

Exploring Job Roles

Web Developer

As a web developer, you are an expert in using the dynamic programming tools and languages that fuel the web. You might work independently or be part of a team that builds and integrates interactive web sites, applications, and services for both internal and public sites. Your role is to make it work, which means developing web applications and testing them on various browsers, enhancing and modifying them as necessary to ensure the best experience for the user. As a web developer, you might also architect websites, design data-driven applications, and find efficient client-server solutions. You must have an in-depth understanding of the software development life cycle and be able to communicate project status, issues, and resolutions.

Windows Developer

As a Windows client developer, knowing how to optimize Windows code and track bugs is a given. But you also know how to use Microsoft Visual Studio® and the Microsoft .NET framework to design, develop, test, and deploy Windows-based applications that run on both corporate servers and desktop computers. Your key talents include understanding multiple Windows application models and n-tier applications, and knowing how to work with object-oriented programming, algorithms, data structures, and multithreading. Windows Developers have an in-depth understanding of software engineering principles, software life cycles, and security principles.

Additional Online Resources for New Developers:

http://msdn.microsoft.com/beginner

http://msdn.microsoft.com/rampup

Imagine Cup

imagine cup™ by Microsoft®

The Imagine Cup is the world's premier student technology competition where students from around the world can learn new skills, make new friends, and change the world. Competitions include Software Design, Embedded Development, Game Design, Digital Media and Windows Phone 7. The brightest young minds harness the power of technology to take on the world's toughest problems.

www.imaginecup.com

Value of Certification

Technology plays a role in virtually everything we do. In the 20-plus years since Microsoft has been certifying people on its products and technologies, millions of people have gained the knowledge, expertise, and credentials to enhance their careers, optimize business solutions, and create innovation within just about every business and social sector imaginable. Today's Information Technology (IT) hiring managers are more often using professional credentials, such as Microsoft certification, to identify properly skilled IT candidates. Certification becomes a way to easily differentiate qualified candidates in a sea of resumes.

The job outlook for IT professionals, as reported in a study prepared by the U.S. Department of Labor's Bureau of Labor Statistics (BLS), is positive! The BLS indicates an increase that will be "faster than the average for all occupations through 2014" for Computer Support Specialists, Systems Engineers, Database Administrators, and Computer Software Engineers. One significant message resulting from this study is that information and communications technology (ICT) skills are the entry ticket to the job market, regardless of the country, industry, or job function. Information Technology is clearly an area worth investing time, resources, and education in – and technology certification is a key part of the education process, validating product and technology expertise as a result of their learning experiences.

Microsoft IT Certifications provide objective validation of the ability to perform critical IT functions successfully for worldwide IT professionals, developers, and information workers. Microsoft certifications represent a rich and varied spectrum of knowledge, job roles, and responsibilities. Further, earning a specific certification provides objective validation of the candidate's ability to perform critical IT functions successfully. Embraced by industry professionals worldwide, Microsoft certification remains one of the most effective ways to help reach long-term career goals.

MTA 98-363

WEB DEVELOPMENT FUNDAMENTALS

1 Programming Web Applications

IN THIS CHAPTER

- 1.1 Customize the layout and appearance of a Web page
- 1.2 Understand ASP.NET intrinsic objects
- 1.3 Understand state information in Web applications
- 1.4 Understand events and control page flow
- 1.5 Understand controls
- 1.6 Understand configuration files

Customize the layout and appearance of a Web page

SCENARIO: Cynthia has just assumed a new position as the lead designer for the campus website. She has a team of 15 fellow students to help with the job.

Her biggest challenge is to ensure that every page of the website shares a common look and feel. The website has the potential of becoming a huge site and visitors must know that they are on the Tigers website no matter where they roam.

- The Tigers' sports page contains many team pictures, schedules, and statistics.
- The library page contains tutoring schedules, book reviews, and new releases.
- Every club is interested in posting their calendars and activities.
- The news page contains recent news about events happening on campus.
- Even faculty members want pages, and there are 108 teachers!

1. **What will be Cynthia's best strategy to accomplish her goal?**
   - **a.** enforce strict guidelines with the team
   - **b.** be the chief editor of all the pages
   - **c.** teach the team to use Cascading Style Sheets (CSS)
2. **CSS is to HTML as:**
   - **a.** an outfit is to a person
   - **b.** an apple is to an orange
   - **c.** a car is to the road
3. **The primary goal of page layout for navigation is:**
   - **a.** to provide links to every page on every page of the site
   - **b.** ease of use
   - **c.** to provide links to other sites

hint

When designing a Web page, "say it with style!"

Answers

1. Cynthia's best strategy is:
   c. teach the team to use Cascading Style Sheets (CSS)
2. CSS is to HTML as:
   a. an outfit is to a person
   Just as an outfit can add style to a person, CSS contains all the elements of style for a page.
3. Primary goal of page layout for navigation is:
   a. ease of use
   Poor page navigation will drive visitors away.

Essential details

- **HTML** is a language for describing web pages using statements in tags (< >) that define the layout of a page.
- **CSS** is a technology to separate style from content in an HTML page.
- **Tables** (<table>) are great tools for organizing information in row and column format.
- **Embedding** saves images or files within a website's directory.
- Remember: Separate style from HTML, use tables or dividers to organize content, embed images, and provide an easy-to-use navigation system.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms531205(VS.85).aspx**
- **http://msdn.microsoft.com/en-us/beginner/bb308760.aspx**

Understand ASP.NET intrinsic objects

SCENARIO: Juan-Carlos loves reading science fiction and spends hours and hours shopping for books online. He is fascinated that the online shopping cart keeps track of all of his shopping activities. He can select books and then change his mind, select additional books, enter special offers and coupons, and even change the quantities of books he selected; the shopping cart is always current with his most recent decisions.

Because Juan-Carlos likes to know how things work, he plans to ask his friend Kim to explain it to him. He has a few questions for Kim:

1. When I'm shopping online, how are the items I select added to the shopping cart?
2. What happens when I change my mind and delete a selection?
3. How does the website keep track of it all?

To answer Juan-Carlos's questions, Kim must brush up on her web development skills. Can you help her out?

1. **What objects are used to store the book selection list?**
   - **a.** session state, application state
   - **b.** Boolean, integer, double
   - **c.** book, CD, magazine
2. **What is meant by the expression "code behind?"**
   - **a.** code that runs on the client
   - **b.** code that runs outside of the HTML code
   - **c.** code that is written in Cobol
3. **True or False:** HTTP is a stateless protocol.
4. **True or False:** A response is sent from the client to the server and request is sent from the server to the client.

hint

Your shopping list would be empty without ASP or a similar web form application.

Answers

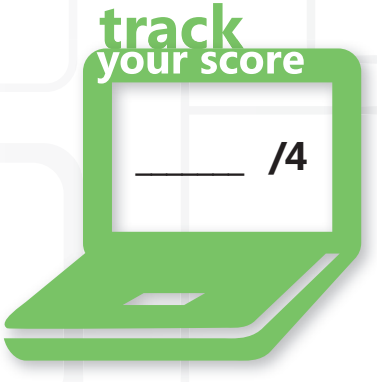
1. The objects used to store selections are:
   a. **session state, application state**
2. Code behind is:
   b. **code that runs on the server**
3. **True:** HTTP is a stateless protocol; it does NOT retain data from session to session.
4. **False:** A response is sent from the server to the client and a request is sent from the client to the server.

Essential details

- **Application state** enables sharing of data across multiple sessions.
- **HttpContext** is a class that includes the intrinsic objects: Request and Response.
- A **Request** retrieves posted data.
- A **Response** sends a message or data back to the client.
- A server receives requests from the client, which also stores data and provides methods to process web requests.
- **Session state** manages data sent from one page to be used by another page later.

FAST TRACK HELP

- **http://quickstarts.asp.net/QuickStartv20/aspnet/doc/pages/pages.aspx**
- **http://msdn.microsoft.com/en-us/beginner/bb308760.aspx**



Understand state information in Web applications

SCENARIO: Tomas recently came to you for advice. It seems he was the victim of a phishing scam and was told by a computer technician to delete his cookies regularly to reduce the risk of future attacks. Tomas is confused because the only cookie he is familiar with goes great with milk.

You explained to Tomas that phishing is a common Internet scam typically carried out by email or instant messaging that often directs users to enter personal details (such as credit card or account numbers) at a fake website that looks and feels almost identical to the legitimate one—and it has nothing to do with a bedtime snack!

You need to further explain the concept of "cookie" to Tomas and how it relates to state management control. To answer Tomas's questions, review some related concepts.

1. **What are cookies?**
   - **a.** websites that mimic famous sites
   - **b.** small text files containing specific client information
   - **c.** a collection of URLs to favorite websites
2. **What data types can be stored in view state?**
   - **a.** strings, integers, Boolean, arrays, arraylist, hash table and custom type converters
   - **b.** name, IP address, URL
   - **c.** vectors, pixels, void, and media types
3. **What four levels of the ASP.NET framework assist with management control?**
   - **a.** analysis, design, code, and test
   - **b.** client, server, host, and domain
   - **c.** application, state, page, and request

hint

HTTP is a stateless protocol; you must use other state management features of ASP.NET to retain data from session to session and page to page.

Answers

1. Cookies are:
   b. small text files containing specific client information
2. These data types can be stored in view state:
   a. strings, integers, Boolean, arrays, arraylist, hash table and custom type converters
3. The four levels of the ASP.NET framework involved are:
   c. application, state, page, and request

Essential details

Questions help determine the state to select: application, control, session, view state.

- How much information do you need to store?
- Does the client accept persistent or in-memory cookies?
- Do you want to store the information on the client or on the server?
- Is the information sensitive?
- What performance and bandwidth criteria do you have for your application?
- What are the capabilities of the browsers and devices that you are targeting?
- Do you need to store information per user?
- How long do you need to store the information?

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/75x4ha6s.aspx**
- **http://msdn.microsoft.com/en-us/beginner/bb308760.aspx**

Understand events and control page flow

SCENARIO: Denise recently introduced Jeff to the video game *Lego Indiana Jones* on the Xbox 360. She is struggling to explain how the game progresses in terms he can relate to. He needs to understand that when he begins the game, he will choose a character, such as Indiana Jones, who possesses some initial abilities (he can use a whip). Next, he will select a map to start the quest. As he solves the puzzles along the way, he will advance from level to level.

Both Jeff and Denise are familiar with web development. It turns out that the life cycle of a character in a game is closely related to the life cycle of a web application. Denise has decided that she can use this analogy to explain the game. The following concepts will help Denise explain the game in terms that Jeff will recognize.

1. **A web page life cycle has several stages. The start and load stages of a page life cycle are similar to:**
   - **a.** starting the game and choosing a character
   - **b.** Indy using his whip and finding tokens
   - **c.** introducing a new character to the game
2. **When events trigged by the user are handled, this is similar to:**
   - **a.** the automatic save function that occurs during the game's progress
   - **b.** when the player uses the controller to move the characters forward in the game
   - **c.** the rendering of the background in the game to simulate a location such as Egypt
3. **True or False:** After Indiana Jones completes the puzzle at the current level, the game is saved and he must choose another level. This is similar to the last event in the page flow—rendering the page.

hint

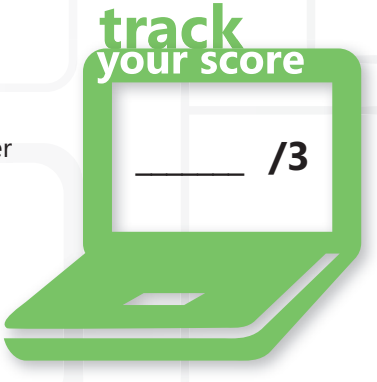
To understand events and control page flow, look for the "SILVER" Start, Initialize, Load, Validate, Event Handling, Render.

Answers

1. The start and load stages of a page life cycle are similar to:
   a. **starting the game and choosing a character**
2. When events trigged by the user are handled, this is similar to:
   b. **when the player uses the controller to move the characters forward in the game**
3. **True**: After Indiana Jones completes the puzzle for the current level, the game is saved and he must choose another level. This is similar to the last event in the page flow—rendering the page.

Essential details

- **The application life cycle** is a series of processing steps executed within an ASP.NET application when a request is made by a browser.
- **Application life cycle events** occur during the application life cycle.
- **Page life cycle events** occur when an ASP.NET page is requested by a browser, such as PreInit, Load, and Render.
- **Control events** are initiated by actions performed on specific controls, such as a Button control's Click event or a TextBox control's TextChanged event.
- **Application events** are invoked by the HttpApplication object (such as BeginRequest, EndRequest, and Error) during the lifetime of an application.
- **Session events** occur during a user's session.
- When an application starts, the page is initialized with its "outfit and abilities" and then loaded. When an event occurs, it is handled and rendered, returning the user back to the page to continue the game.



FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms178472.aspx**
- **http://www.asp.net/learn/videos/video-6558.aspx**

Understand controls

SCENARIO: Your friend Margie just opened a travel agency. She has hired you to create a website for her new business–Margie's Travel. In the first deployment of the website, Margie has asked you to provide the following features:

- A calendar
- A currency converter
- A form to request more information
- A form to sign up for future emails about upcoming events

The first step in creating a new website is to meet with the client to discuss her needs and to gather the specific requirements of the site. During your visit with Margie, you realize that this website will need several user controls, server controls, and validation controls. You will need to make many decisions to create the perfect solution for the Margie's Travel website.

1. **Which type of control is best for adding a dynamic calendar to the site?**
   - **a.** user control
   - **b.** validation control
   - **c.** server control
2. **To ensure that the user enters the data in the correct format for the currency converter, what controls must be included?**
   - **a.** user controls
   - **b.** validation controls
   - **c.** web controls
3. **What type of control allows the user to modify the appearance and behavior of the user interface directly from the browser?**
   - **a.** web control
   - **b.** user control
   - **c.** server control

hint

If you have common user interface components on multiple pages, create a user control that can be reused on other pages.

Answers

1. The type of control best for adding a dynamic calendar to your web site is a:
   c. server control
2. To make sure the user enters the data in the correct format for the currency converter, include:
   b. validation controls
3. The user can modify the appearance and behavior of user interface directly from the browser with a:
   a. web control

Essential details

- **User controls** may contain HTML markup, web controls, and server controls, created using a visual design surface resulting in an .ascx file.
- **Server controls** can be used in .aspx pages, user controls, and other server controls, rendering HTML markup when viewed in an ASP.NET web page.
- **Web controls** define the methods, properties, and events common to all controls in the WebControls namespace.
- **Validation controls** inherit from the base Web Control class providing validation functions using very specific sets of rules that are applied to user-entered data.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/yhzc935f.aspx**
- **http://www.asp.net/learn/3.5-videos/video-221.aspx**
- **http://msdn.microsoft.com/en-us/beginner/bb308760.aspx**

Understand configuration files

SCENARIO: The Tigers' school website is off to a good start and attracting many visitors, including teachers, parents, and students. Several teachers also serve as school club advisors. They asked Cynthia if they can use the website to raise funds for their organizations by enabling visitors to order school spirit clothing from the site. Cynthia is eager to help them put their plans into action—it will be good for the school and for the students.

Cynthia decides to write a program in C# to use in completing this project, but she realizes that she needs to update the web.config file to ensure that the program compiles correctly and enables debugging when the application is deployed. She needs to review a few concepts about this process so that she can efficiently make changes to the site and help the organizations meet their goals.

1. **Why did Cynthia decide to update the web.config file instead of the machine.config file?**
   - **a.** she does not need a machine.config file
   - **b.** the web.config file is used to set information for a web server, website, or specific web applications within a website
   - **c.** changes are only allowed in the web.config file(s)
2. **What language is used in the two files?**
   - **a.** XML
   - **b.** HTML
   - **c.** JavaScript
3. **True or False:** Child directories inherit the settings of the parent directory unless they are overwritten at the child level.

hint

Because there is only one machine.config file, it is easy to maintain. When you deploy a web application on a new server, you must copy the machine.config file separately.

Answers

1. Cynthia updated the web.config file instead of the machine.config file because:
   b. **the web.config file is used to set information for a web server, website, or specific web applications within a website**
2. The language used in the two files is:
   a. **XML**
3. **True**: Child directories inherit the settings of the parent unless they are overwritten at the child level. Each file applies settings to its directory and below, but can be changed in the sub-directories.

Essential details

- **Web.config** contains configuration settings for an ASP.NET web application.
- **Machine.config** contains the ASP.NET settings that apply to the entire web server.
- **Remoting** can be used to communicate with other application domains in the same process, or components that may exist in other processes, and so on.
- **Channels** transport messages between applications across remoting boundaries, whether between application domains, processes, or computers.

FAST TRACK HELP

- **http://www.asp.net/learn/videos/video-284.aspx**
- **http://msdn.microsoft.com/en-us/library/1xtk877y%28VS.71%29.aspx**
- **http://msdn.microsoft.com/en-us/beginner/bb308760.aspx**

2

Working with Data and Services

IN THIS CHAPTER

Read and write XML data

SCENARIO: Yan is a student at the same school where Cynthia works. He is taking a web development course and he wants to help with the school web site.

Cynthia just finished the program to enable visitors to order fundraiser items from the website, but she realizes that she needs to create a file with customer information that can be easily exchanged between different applications. She decides to use XML and asks Yan to help her create the file layout and XML tags to make sure it is a well-formed document.

The final step of the project requires extensive testing, so she is going to ask Yan to test her application before it is deployed; this is a great way for him to learn more about the web development process.

1. **Why did Cynthia decide to use XML as a format for the data file?**
   - **a.** XML is an almost universally supported way of exchanging documents and data
   - **b.** XML is easier to learn than HTML
   - **c.** XML reduces the file size of the data file
2. **What is another use of XML tags?**
   - **a.** to create web pages instead of HTML
   - **b.** to document an application program
   - **c.** to write an application to process data
3. **True/False:** XML is not case sensitive—for example, <order id = "123"> and </Order> are syntactically correct starting and ending tags, just like HTML.

hint

Download XML Notepad 2007 to make creating XML files even easier: http://www.microsoft.com/downloads/details.aspx?familyid=72d6aa49-787d-4118-ba5f-4f30fe913628&displaylang=en

Answers

1. Why did Cynthia decide to use XML as a format for the data file?
   a. **XML is an almost universally supported way of exchanging documents and data**
2. What is another use of XML tags?
   b. **to document an application program**
3. **False**: XML **is** case sensitive: <order id = "123"> and </Order> are not syntactically correct starting and ending tags. It is true that HTML is **not** case sensitive.

Essential details

- **XML** (e**X**tensible **M**arkup **L**anguage) lets web developers create customized tags that offer flexibility in organizing data and provides an efficient means of transport for that data.
- **A well-formed XML document** meets all the syntactical requirements defined for an XML document.
- **XML validation** requires that the elements must appear in a defined structure and the content of the individual elements must conform to the declared data types specified in the schema.
- **XML Schema** is one of many schema languages used to provide a common base for data description and validation in XML documents.

FAST TRACK HELP

- **http://quickstarts.asp.net/QuickStartv20/howto/doc/Xml/OverviewofXML.aspx**
- **http://msdn.microsoft.com/en-us/data/bb190600.aspx**
- **http://msdn.microsoft.com/en-us/library/1xtk877y%28VS.71%29.aspx**

Distinguish between DataSet objects and DataReader objects

SCENARIO: The Coho Winery—located in Baden, Germany—is expanding with the purchase of another local winery. To prepare for this expansion, Coho Winery must update the website to include the additional selection of wines and initiate efficient business practices. The lead web developer, Thorsten Weinrich, has been assigned the task of updating the site to accommodate the new business demands. Thorsten realizes that the current site needs some major updates. In a discussion with the owner, he defines several new business requirements for the site.

For a positive experience, visitors must be able to:

- Search for specific wines.
- Sort the wine selection by date, color, and variety (Champagne, Burgundy, and so on).

The business manager must be able to:

- Dynamically add new wines to the selections.
- Produce reports of the current stock of wines on hand.

1. **To update the information stored about the current wines available, he should use:**
   - **a.** DataSet objects
   - **b.** DataReader objects
   - **c.** Update objects
2. **To produce reports on current inventory, he should use:**
   - **a.** DataSet objects
   - **b.** DataReader objects
   - **c.** Sorter objects
3. **What is the main difference between DataSet and DataReader objects?**
   - **a.** DataSet objects represent multiple DataTables and provide read/write DataReader objects represent data from one database and are read-only
   - **b.** DataReader objects represent multiple DataTables and provide read/write DataSet objects represent data from one database and are read-only
   - **c.** there are no significant differences between the two

hint

Because DataSet objects may store a large amount of data in memory, they are often very resource-intensive, and should be used judiciously.

Answers

1. To update the information, he should use:
   a. **DataSet objects**
      These allow the user to read and update the DataTables represented by this object.
2. To produce reports on current inventory, he should use:
   b. **DataReader objects**
      These are a better choice when you only need to read from the database.
3. The main difference between DataSet and DataReader objects is:
   a. **DataSet objects represent multiple DataTables and provide read/write access while DataReader objects represent data from one database and are read-only**

Essential details

- **DataSet** is a memory-resident representation of data that provides a consistent relational programming model regardless of the source of the data it contains.
- **DataReader** is a lightweight, high-performance data access object used for read-only access.
- **Data binding** establishes a connection between an ASP.NET web page control and a data source.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/haa3afyz.aspx**
- **http://msdn.microsoft.com/en-us/library/system.data.dataset.aspx**
- **http://msdn.microsoft.com/en-us/magazine/cc188717.aspx#S4**

Call a service from a Web page

SCENARIO: Margie's Travel has finished documenting the requirements for an online currency converter. The application will provide current exchange rates for all of the travel destinations offered by the agency. After reviewing the requirements and the timeline for completion, you realize that you will need additional help to complete the task.

Sanjay is a friend from college and has worked on several websites for friends and businesses. After talking to Sanjay, you both decide that the best approach is to develop the converter program in C#, and use a WFC framework to call the service application. Sanjay will create the currency conversion program and you will be responsible for implementing the call from the client.

1. **What is the first step in creating a basic Windows Communication Foundation (WCF) service?**
   - **a.** configure a WFC client
   - **b.** create a WFC client
   - **c.** define a WFC service contract
2. **What is the last step in creating the WFC service?**
   - **a.** compile the service code, using the ServiceModel Metadata Utility Tool (Svcutil.exe) to create the WCF client
   - **b.** define a WFC service contract
   - **c.** implement the service contract
3. **After the service is compiled using the ServiceModel Metadata Utility Tool, what type of file is created to specify the configuration to the client?**
   - **a.** an HTML file
   - **b.** an XML file
   - **c.** a JavaScript file

hint

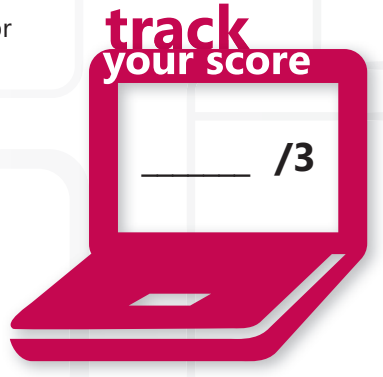
Don't reinvent the wheel every time; search for existing WFC services first because they can be used by several client applications.

Answers

1. The first step in creating a basic Windows Communication Foundation (WCF) service is:
   c. **define a WFC service contract**
2. The last step in creating the WFC service is:
   a. **compile the service code using the ServiceModel Metadata Utility Tool to create the WCF client (http://msdn.microsoft.com/en-us/library/aa347733.aspx)**
3. After the service is compiled, the file created to specify the configuration to the client is:
   b. **an XML file**

Essential details

- **A web service** is a modular collection of Web protocol–based applications that can be mixed and matched to provide business functionality through an Internet connection.
- **WFC service** uses Windows Communication Foundation, Microsoft's unified programming model, for building service-oriented applications.
- **The basic life cycle of a WFC application**:
  1. Define the service contract.
  2. Implement the contract.
  3. Configure the service by specifying endpoint information and other behavior information.
  4. Host the service in an application.
  5. Build a client application.



FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms731835.aspx**
- **http://www.asp.net/learn/videos/video-280.aspx**
- **http://www.asp.net/learn/3.5-videos/video-231.aspx**

Understand DataSource controls

SCENARIO: Thorsten has been busy finalizing the plans for the new Coho Winery website. Now that the business requirements are defined, he can begin revising the site and writing the programs to access and update the data. The data for the winery is currently held in a Microsoft® SQL Server® database and much of the new functionality of the site depends upon interactions with that data. A quick review of requirements reminds Thorsten of the tasks to be completed.

For a positive experience on the site, visitors must be able to:

- Search for specific wines
- Sort the wine selection by date, color, and variety (Champagne, Burgundy, and so on)

The business manager must be able to:

- Dynamically add new wines to the selections
- Produce reports of the current stock of wines on hand

1. **Which DataSource control will Thorsten use?**
   a. LinqDataSource
   b. SqlDataSource
   c. XmlDataSource
2. **Which DataSource would be used to provide access to ASP.NET server controls such as TreeView or Menu Control?**
   a. LinqDataSource
   b. SqlDataSource
   c. XmlDataSource
3. **What is a benefit of using DataSource controls?**
   a. reduce the amount of code required to access data
   b. provide quicker access to the data
   c. allow the user to access more data at one time

hint

The type of data repository being used will determine the DataSource control needed.

Answers

1. The DataSource control that Thorsten will use is:
   b. SqlDataSource
2. The DataSource that would provide access to ASP.NET server controls such as TreeView or Menu Control is:
   c. XmlDataSource
3. A benefit of using DataSource controls is:
   a. reduce the amount of code required to access data

Essential details

- **LINQ** (Language Integrated Query) is a set of extensions to the Microsoft .NET Framework that encompass LINQ, set, and transform operations.
- **LinqDataSource** enables the use of LINQ in an ASP.NET Web page through markup text to retrieve and modify data from a data object.
- **ObjectDataSource** represents a business object that provides data to data-bound controls in multitier web application architectures.
- **XmlDataSource** belongs to the family of data source controls in ASP.NET, which enables a declarative data-binding model against a variety of underlying data stores.
- **SqlDataSource** represents a connection to an ADO.NET SQL database provider, such as Structured Query Language (SQL), OLEDB, ODBC, or Oracle.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms227679.aspx**
- **http://msdn.microsoft.com/en-us/library/ms178359.aspx**
- **http://www.asp.net/learn/linq-videos/**

Bind controls to data by using data-binding syntax

SCENARIO: Plans for the Coho Winery website are progressing nicely. Based on the initial analysis of business requirements for the site, Thorsten determined that he needs two types of data-binding—one for displaying the information about each wine and another for updating and adding new wines to the shopping cart.

Data-binding will be ideal to incorporate user-interface controls, such as check boxes for sorting and displaying wines by year and category. Thorsten also plans to use data-binding controls to allow the user to update the list of selected wines so that the updated information propagates immediately to all of the associated forms.

1. **Typically, each binding has four components:**
   - **a.** a binding target object, a path to the value in the binding source, data conversion default value, and collection view
   - **b.** a binding target object, a target property, a binding source, and a path to the value in the binding source
   - **c.** a target property, a binding source, data conversion default value, and a path to the value in the binding source
2. **The Coho website must enable users to change the data and propagate it back to the source object. Therefore, Thorsten must use:**
   - **a.** OneWay binding
   - **b.** TwoWay binding
   - **c.** OneWayToSource binding
3. **When would Thorsten use the empty binding syntax (Example: <ListBox ItemsSource="{Binding}" IsSynchronizedWithCurrentItem="true"/>)?**
   - **a.** when he has already bound another item with the same source
   - **b.** when he doesn't know the datasource name to bind to
   - **c.** when he wants to bind to the entire object

hint

Spend a little extra time early in the project to save time later; set up correct data-bind controls in the beginning. When the data changes its value, the elements that are bound to the data reflect changes automatically.

Answers

1. Typically, each binding has:
   b. **a binding target object, a target property, a binding source, and a path to the value in the binding source**
2. To enable users to change the data and propagate it back to the source object, Thorsten must use:
   b. **TwoWay binding**
   TwoWay binding causes changes to either the source property or the target property to automatically update the other
3. Thorsten would use the empty binding syntax when:
   c. **he wants to bind to the entire object**

Essential details

- A **control** is an object in the a graphical-user interface that can be manipulated by the user to perform an action.
- **Data binding** establishes a connection between the application user-interface (UI) and business logic.
- **A data-aware control** allows the control to bind to data. Data-aware controls are distinguished by the presence of the DataSource property.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms752347.aspx**
- **http://msdn.microsoft.com/en-us/library/aa480224.aspx**
- **http://msdn.microsoft.com/en-us/data/ff806174.aspx (video)**

Manage data connections and databases

Scenario: The Coho Winery website is almost finished! The last step in completing the site requires Thorsten to establish the necessary database connections. The current database of information about the wines is stored on a Microsoft® SQL Server® computer, so he decides to keep this platform for the data repository.

Because the new wines contain the same data properties, it is just a matter of adding the new wines to the database through the UI (user-interface). Thorsten has the necessary information for securing the connection from the old website, so he just needs to add this logic to the new version.

1. **Which connection object best fits the preceding scenario?**
   - **a.** OleDbConnection
   - **b.** SqlConnection
   - **c.** OdbcConnection
2. **Thorsten knows that the database connection will be required for several interactions on the site, so he decides to use connection pooling. This is wise because:**
   - **a.** connection pooling reduces the number of times that new connections need to be opened
   - **b.** connection pooling prevents deadlocks
   - **c.** connection pooling automatically closes unused open connections
3. **Every request executed on the database is considered a transaction object. What command is used to undo a completed request?**
   - **a.** commit
   - **b.** rollback
   - **c.** undo

hint

Use the Server Explorer to connect to a database. Watch it in action at http://msdn.microsoft.com/en-us/library/0wbea1ae(v=VS.80).aspx.

Answers

1. The best fit for the scenario is:
   b. SqlConnection
2. Using connection pooling is wise because:
   a. it reduces the number of times that new connections need to be opened
3. A completed request executed on the database can be undone with:
   b. rollback

Essential details

- A **database connection** enables the user to read and write data and create Structured Query Language (SQL) objects in the database.
- **Connection objects** provide the capability to move data between a data store and an application.
- **Connection pooling** manages connections as shared resources that can be assigned from a pool of recently used connections.
- A **transaction object** allows multiple tasks to be bound together.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms810829(v=MSDN.10).aspx**
- **http://msdn.microsoft.com/en-us/library/ms171962(v=VS.80).aspx**
- **http://msdn.microsoft.com/en-us/library/6759sth4.aspx**

3

Troubleshooting and Debugging Web Applications

IN THIS CHAPTER

Debug a Web application

Scenario: Nuria Gonzalez is the leader of a band that specializes in the lively Conjunto music of Northern Mexico. Nuria is the main vocalist and is supported by Jose with the button accordion, Tomás on the Bajo Sexto, Pablo playing an electric bass, and Isabelle keeping the beat on the drums.

The band is eager to make themselves known to the community. They want to tell about their music, post details about upcoming concerts, offer a newsletter, and introduce the members of the band. They've decide the best way to reach their audience is with a website. Nuria is majoring in web design in college, so she offers to create the site, find a hosting company, and keep the site updated.

To be sure that all of the band members are happy with the site, she has invited them to help with the site testing before it is made public. The first version is ready.

1. **What type of errors does Nuria expect the testers to find?**
   - **a.** syntax errors
   - **b.** logic errors
   - **c.** diagnostic errors
2. **What element can be added to the config file to assist in testing the application?**
   - **a.** trace element
   - **b.** debug element
   - **c.** diagnose element
3. **What two levels of error debugging can be configured in a application to allow tracing?**
   - **a.** page and application level
   - **b.** page and site level
   - **c.** application and database level

hint

Find inexperienced users to test your site. Their honest opinions are critical for improving the site, so don't be defensive if they provide negative feedback or find errors.

Answers

1. Nuria expects the testers to find:
   b. **logic errors.** Unlike logic errors, syntax errors occur in compiling.
2. The element that can be added to the config file to assist in testing is the:
   a. **trace element**
3. The two levels of error debugging that can be configured to allow tracing are:
   a. **page and application level**

Essential details

- **Debugging** is the process to detect, locate, and correct logical or syntactical errors in a program.
- A **custom error page** displays detailed error information to help administrators and developers troubleshoot and solve Active Server Pages (ASP) coding issues.
- **ASP.NET tracing** enables you to view diagnostic information about a single request for an ASP.NET page.
- **Trace.axd** (*trace viewer)* can be used to view trace information that is collected and cached by ASP.NET when tracing is enabled.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/6915t83k.aspx**
- **http://msdn.microsoft.com/en-us/library/w2faa92k(VS.71).aspx**
- **http://msdn.microsoft.com/en-us/library/system.diagnostics.trace.aspx**

Handle Web application errors

SCENARIO: The website for the Conjunto band is ready for testing, and Jose, Tomás, Isabelle, and Pablo are eager to see what Nuria has created. She has asked the musicians and some family members to help with the testing process. To provide Nuria with useful feedback and specific details for improving the site, they will need some guidance in testing techniques. Website testing requires unique skills and some background knowledge.

To provide good test questions, she needs to review the type of web-application errors the testers can expect.

1. **What are the four levels of error handling in a web application?**
   - **a.** page level, application level, server level, and GUI level
   - **b.** code block error handling, page level, server level, and IIS level
   - **c.** code block error handling, page level, application level, and server level
2. **An important test includes some common HTTP error codes. Which of the following codes should Nuria's testers expect or look for?**
   - **a.** 403, 404, 500, 501
   - **b.** 400, 401, 402, 403
   - **c.** 500, 502, 503, 600
3. **What is the code block syntax for handling errors that occur during program execution?**
   - **a.** try....finally
   - **b.** try...catch...finally
   - **c.** try...catch...end

hint

Plan for the worst! Set up the code and configurations to handle unknown errors and prevent data corruption, security risks, and user frustration.

Answers

1. The four levels of error handling are:
   c. **code block error handling, page level, application level, and server level**
2. Nuria's testers should look for:
   a. **403, 404, 500, 501**
3. Errors can be handled during program execution with:
   b. **try...catch...finally**

Essential details

- **In** .NET programming, an **exception** is an error that occurs at run time and is *thrown* (or *raised*). Exception handlers can *catch* exceptions and try to fix the problem, report it, or ignore it.
- **HTTP (**Hypertext Transfer Protocol) is used to carry requests from a browser to a web server and to transport pages from web servers back to the requesting browser.
- **A handler** processes a particular type of message. This might be a separately defined method or an anonymous delegate (inline code).

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/aa478986.aspx**
- **http://msdn.microsoft.com/en-us/library/ms524952(VS.90).aspx**
- **http://msdn.microsoft.com/en-us/library/8a9f2ew0(VS.71).aspx**

4

Working with Client-Side Scripting

IN THIS CHAPTER

Understand client-side scripting

SCENARIO: Summer holiday is quickly approaching and Robin Wakefield is in charge of finding a location for this year's family reunion. He knows that several of his cousins enjoy kayaking and other outdoor activities, so he is researching locations where they can camp and kayak for the long weekend.

Robin is concerned about finding a location that works for all of his relatives, so he decides to create a family reunion website. The site will allow him to gather information from his relatives and narrow down the choices for the reunion.

Robin has decided to use the scripting language JavaScript to provide:

- a countdown to the reunion weekend
- a selection of vacation destinations in Scotland
- a form to obtain preferences (such as tent camping or hotels) and special requests
- a list of items to bring such as food items, utensils, and sporting gear
- a hangman game he created with the names of family members

Robin has many things to consider in designing the website. A quick review of client-side scripting will prove to be time well spent!

1. **Which of the following is NOT a benefit of client-side scripting:**
   - **a.** it increases user interactivity
   - **b.** it allows pages to share scripts
   - **c.** it is functional on all browsers
2. **Which of these is NOT true about linking to an external file that contains scripting code:**
   - **a.** the code is easier to maintain
   - **b.** the number of scripts that can be attached to a page is limited
   - **c.** the script only has to be loaded into the cache once
3. **Which of the following is NOT a scripting language:**
   - **a.** Perl
   - **b.** AJAX
   - **c.** Java

hint

If the script applies to only one page and is small, embed directly in the HTML. Otherwise, save the script in an external file and attach to the HTML code.

Answers

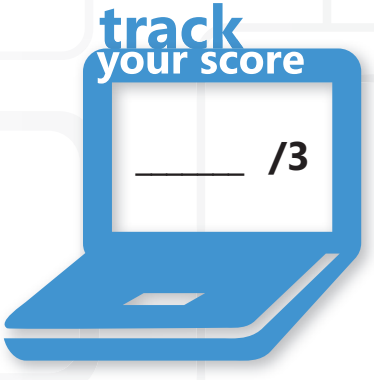
1. Client-side scripting is not:
   c. **functional on all browsers.** The browser must be enabled to run scripts.
2. The following is NOT true about linking to an external file containing the scripting code:
   b. **The number of scripts that can be attached to one page is limited.** There is no limit.
3. The following is NOT a scripting language:
   c. **Java.** It can be confusing, but JavaScript and Java are two different development languages with distinct purposes.

Essential details

- A **script** is a set of instructions added to an application or a utility program. On the Web, scripts are commonly used to add interactivity.
- Perl and AJAX are two scripting language that are used to create scripts that perform special or limited tasks associated with a particular application or function.
- **Client-side scripting** runs within the user's web browser and generate elements such as alert displays, confirmation boxes, and pop-up windows.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/dd584169(office.11).aspx**
- **http://msdn.microsoft.com/en-us/library/aa292164(VS.71).aspx**
- **http://msdn.microsoft.com/en-us/library/aa479302.aspx**



Understand AJAX concepts

SCENARIO: Robin's entire family is excited to participate in planning for the upcoming family reunion in Scotland. Everyone has ideas about the location and activities that they want to share on the site being created.

Robin is nearly finished with the first version of the website but he notices that the website loads very slowly and responds rather sluggishly. To make the site more efficient, he decides to enlist of the help of AJAX. No, this is not the name of a friend; it stands for **A**synchronous **J**avaScript **a**nd **X**ML.

Understanding the important concepts of AJAX will enable Robin to have the site up and running smoothly very soon.

1. **If most of the information on a page does not change as the user interacts with the site, Robin can use AJAX to:**
   - **a.** perform partial page updates
   - **b.** prevent users from changing data
   - **c.** capture HTTP error codes
2. **Web form applications created with AJAX feature:**
   - **a.** automatic login security
   - **b.** interactive UI elements such as progress indicators, tooltips, and pop-up windows
   - **c.** a design to send and receive data for each user request, including the visual design of the page
3. **AJAX provides:**
   - **a.** support for most browsers
   - **b.** a Microsoft AJAX library that includes both JavaScript and C# programs
   - **c.** a timer control to send complete postbacks every five minutes

hint

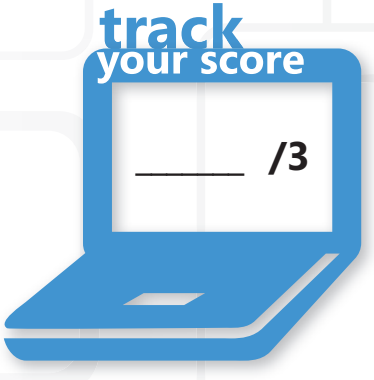
If there are no changes to the design of a page when the user modifies the data content use AJAX to make your site more efficient by performing partial page updates.

Answers

1. If most of the information on the page does not change as the user interacts with the site, Robin can use AJAX to:
   a. **perform partial page updates**
2. Web form applications created with Ajax feature:
   b. **interactive UI elements such as progress indicators, tooltips, and pop-up windows**
3. AJAX provides:
   b. **support for most browsers**

Essential details

- **AJAX** is a group of interrelated web development technologies that can be used to augment a Web application to communicate with a server asynchronously in the background, without interfering with the current state of the page.
- **The ASP.NET AJAX Library** is a collection of resources that enables a developer to build database-driven web applications that execute entirely within a web browser.
- **EnablePartialRendering** is a feature that enables partial rendering of a page, which in turn enables you to update regions of the page individually by using UpdatePanel controls.
- **UpdatePanel** enables sections of a page to be partially rendered without a postback.
- A timer control performs asynchronous or synchronous web page postbacks at a defined interval.



FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/bb397536.aspx**
- **http://www.asp.net/ajax**
- **http://www.asp.net/ajax/ajaxcontroltoolkit/samples/**

5

Configuring and Deploying Web Applications

IN THIS CHAPTER

Configure authentication and authorization

Scenario: A group of high-school video game enthusiasts in the Dominican Republic has decided that they need an online forum to enable them to share ideas and exchange strategies for their favorite games. They agree that they want it to be a closed forum for just their group of friends. The group takes their video games very seriously!

One of the students, Manuel Machado, has created the site that will host the forum. Because the group wants the site to be private, he will add a login page for members to sign in with a special user ID and password. Manuel must consider several details for ensuring that users are correctly authenticated.

1. **If Manuel uses a Windows-based authentication, how does the application determine the user's authorization to access the site?**
   - **a.** uses an authorization cookie
   - **b.** relies on the Windows operating system and IIS
   - **c.** requires the application programmer to validate users
2. **For which applications would it be best to use Windows-based authentication?**
   - **a.** intranet applications
   - **b.** e-commerce applications
   - **c.** extranet applications
3. **How does forms-based authentication determine a user's access to the site?**
   - **a.** redirects the user to a login page and compares the user's credentials to a list of valid users
   - **b.** creates a cookie that contains the user's name and role
   - **c.** requires the user to have a Windows account that can be authenti- by a Web server

hint

When using forms-based authentication, a login page and a process to allow users to sign out are required.

Answers

1. If Manuel uses a Windows-based authentication, the application determines the user's authorization to access the site by:
   b. relying on the Windows operating system and IIS
2. It is best to use Windows-based authentication:
   a. for intranet applications
3. Forms-based authentication determine a user's access to the site by:
   a. redirecting the user to a login page and comparing the user's credentials to a list of valid users

Essential details

- **Authentication** is the process of validating client identity, usually by means of a designated third-party authority.
- **Forms authentication** uses an authentication ticket that is created when a user logs on to a site; then it tracks the user throughout the site.
- **Windows authentication** is an ASP.NET web application that relies on the Windows operating system to authenticate the user.
- **Authorization** determines whether an identity should be granted access to a specific resource.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/eeyk640h.aspx**
- **http://msdn.microsoft.com/en-us/library/wce3kxhd.aspx**
- **http://msdn.microsoft.com/en-us/library/330a99hc.aspx**

Configure projects and solutions and reference assemblies

Scenario: Manuel Machado has finished the setup and programming for the gaming forum website. He created a sign-in screen and forum pages, and he added all of his high-school friends to the list of allowed users. The group helped complete the local testing of the site and everything appears to be working.

Manuel has selected a hosting company, A. Datum Corporation, and he needs to configure the web application and project based on the information he obtained from the hosting company. When that is complete, he can deploy the application. Manuel is very excited to see the site on the Internet and wants to be sure he knows everything he needs to know for a successful deployment.

1. **To reduce future compilation changes to the application, what files should Manuel use to identify the system specific information needed to run the web application?**
   - **a.** default.html and default.config
   - **b.** machine.config and web.config
   - **c.** machine.js and web.js
2. **Which of the following form the fundamental unit of deployment?**
   - **a.** assemblies
   - **b.** configuration files
   - **c.** web application projects
3. **Why do assemblies need a strong name that is fully qualified?**
   - **a.** the name is used to deploy an assembly into the GAC (Global Assembly Cache)
   - **b.** the name is used at run time to locate the assembly and impacts the and use by an application.
   - **c.** the name is used to provide security permissions.

hint

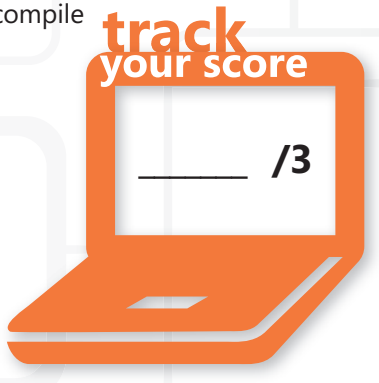
A strong assembly name that is fully qualified would look similar to: myTypes, Version = 1.0.1234.0, Culture = "en-US", PublicKeyToken = b77a5c561934e089c.

Answers

1. To reduce future compilation changes to the application, Manuel should use these files to identify the system specific information:
   b. machine.config and web.config
2. The fundamental unit of deployment is:
   a. assemblies
3. Assemblies need to have a strong name that is fully qualified because:
   b. the name is used at run time to locate the assembly and impacts the scope and use by an application

Essential details

- **Assemblies** are the building blocks of Microsoft .NET Framework applications; they form the fundamental unit of deployment, version control, reuse, activation scoping, and security permissions.
- **A Web Application Project** is a model for creating a web application (a set of clients and servers that cooperate to provide the solution to a problem); the structure and build semantics closely resemble the project model in Visual Studio® .NET.
- **A Web Site Project** is a model for creating a website (a group of related HTML documents and associated files, scripts, and databases that is served up by a server on the World Wide Web); the structure is a Windows-style arrangement of files and folders that dynamically compile when a site is opened.
- The **AppSettings** section of the configuration file contains a series of name/value pairs use for various purposes.



FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/bb514724.aspx**
- **http://msdn.microsoft.com/en-us/library/hk5f40ct(VS.71).aspx**
- **http://msdn.microsoft.com/en-us/library/yf1d93sz.aspx**

Publish Web applications

Scenario: Manuel has brushed up on his knowledge about deploying a web application and is ready to work with the A. Datum Corporation to finally get the game enthusiasts' forum on the Web.

A. Datum has informed Manuel that they will be hosting his site on their new web server that is running IIS (Internet Information Server). This is good news for Manuel because he knows that the Microsoft IIS platform provides a flexible, easy-to-maintain web server. He thinks he is ready to migrate the site to the new server.

1. **When deploying an ASP.NET application, where are the configuration settings stored?**
   - **a.** Microsoft IIS metabase
   - **b.** XML files
   - **c.** HTML files
2. **Which of these describes an MSI deployment?**
   - **a.** creates a Microsoft Windows installer package with instructions and data to install an application
   - **b.** copies the entire directory with the application and configuration files at one time
   - **c.** publishes a non-updatable application to the Web server
3. **Manuel knows that the configuration of an ASP.NET installation depends upon the destination's version of IIS. If the A. Datum Corporation is using Windows 2000 Server®, which version of IIS will be running?**
   - **a.** IIS 5.0
   - **b.** IIS 6.0
   - **c.** IIS 7.0

hint

The system will automatically detect changes to the configuration files in an IIS environment; there is no need to restart IIS or reboot.

Answers

1. When deploying an ASP.NET application, the configuration settings are stored in:
   b. XML files
2. MSI deployment:
   a. creates a Microsoft Windows installer package with instructions and data to install an application
3. If the A. Datum Corporation is using Windows 2000 server, the version of IIS running is:
   a. IIS 5.0

Essential details

- **An MSI file** (Microsoft Windows Installer package (.msi) is a file containing the instructions and data required to install an application.
- **Internet Information Services** (IIS) for Microsoft Windows Server® is a flexible, secure, and easy-to-manage web server for hosting anything on the web.
- IIS 7 is built on a modular architecture. Modules, known as extensions, can be added individually so that only the extensions needed for specific functionality are installed.
- **ASP.NET configuration data** is stored in XML text files named web.config. that can appear in multiple directories in ASP.NET applications.

FAST TRACK HELP

- **http://msdn.microsoft.com/en-us/library/ms178477.aspx**
- **http://msdn.microsoft.com/en-us/library/aa243945(VS.60).aspx**
- **http://msdn.microsoft.com/en-us/magazine/cc163448.aspx**

Understand application pools

Scenario: Manuel has completed the deployment of his web application. He and his fellow game enthusiasts are eager to start communicating on this new forum.

While Manuel was visiting with the representative from A. Datum Corporation, the representative mentioned that Manuel's application will be assigned to an application pool. Manuel was uncertain about the impact of this on his program and decided to do a little research so that he could reassure his friends about the performance of the new forum. He felt comfortable that he would be able to answer his friends' questions after his research was completed.

1. **What is an application pool?**
   - **a.** a group of one or more URLS that are served by a worker process or set of worker processes
   - **b.** a group of configuration files that are stored in the same directory as the content
   - **c.** something that contains any project created at an HTTP location in the new project dialog box
2. **How are they useful?**
   - **a.** determine the right to access a resource
   - **b.** provide the common language runtime with the information it needs to be aware of type implementations
   - **c.** provide an easy way to administer a set of websites, applications, and their worker processes
3. **If an error occurs when adding an application pool, what is a good place to start looking for problems?**
   - **a.** check to make sure the pool name is unique
   - **b.** check the settings in the web.config file
   - **c.** check the GAC (Global Assembly Cache)

hint

Using application pools significantly increases the reliability and manageability of the web infrastructure.

Answers

1. An application pool is:
   a. **a group of one or more URLS that are served by a worker process or set of worker processes**
2. They are useful for:
   c. **providing an easy way to administer a set of websites, applications, and their worker processes**
3. If an error occurs when adding an application pool:
   a. **check to make sure the pool name is unique**

Essential details

- **An application pool** is a group of one or more Uniform Resource Locators (URLs) that are served by a worker process or set of worker processes.
  - Any web directory or virtual directory can be assigned to an application pool.
  - An application pool provides a convenient way to administer a set of websites and applications and their corresponding worker processes.
  - An application pool significantly increase both the reliability and manageability of a web infrastructure.

FAST TRACK HELP

- **http://technet.microsoft.com/en-us/library/cc753449(WS.10).aspx**
- **http://msdn.microsoft.com/en-us/library/ms525832(VS.90).aspx**
- **http://msdn.microsoft.com/en-us/library/ms734677.aspx**