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Contents

Cramsession™ for I-Net + Certification

Abstract:

This Cramsession will help you to prepare for the CompTia I-Net+ Exam. Exam topics include I-Net Basics, I-Net Clients, Development, Networking and Infrastructure, Security, and Business Concepts.

i-Net + Certification

INTERNET BASICS

1.1 Describe a URL, its functions and components, different types of URLs, and the use of the appropriate type of URL to access a given type of server. Content may include the following:

- Protocol – while any number of protocols can be used for networking, the Internet is dependent upon the standardized use of TCP/IP.
- Address – Every host must have a unique IP address. This address is a 32-bit binary number written in decimal format as four octets (for example: 1.2.3.4). Because they are just decimal representations of binary numbers, each octet must have a value between 0 and 255. The first octet identifies the class of network, with the following being valid entries:

1 – 126	Class A
128 – 191	Class B
192 – 223	Class C
224 – 239	Class D (multicast)

- Addresses cannot consist of all zeros, or all ones, and the entire 127 domain is reserved because 127.0.0.1 is set aside as the "loopback" address.
- Port – TCP and UDP use port numbers for services. The port numbers for common services are:

21	FTP
23	Telnet
25	SMTP
80	HTTP/WWW
110	POP3
119	NNTP
389	LDAP

- These ports are the default, and if you change the service to another port, those accessing it must specify the new port in their request. For example, if the web service is changed from port 80 to port 800, the URL to access the site ds-technical.com becomes: http://www.ds-technical.com:800

1.2 Identify the issues that affect Internet site functionality (e.g., performance, security and reliability). Content may include the following:

- Bandwidth – The amount of data that can be simultaneously transmitted on a medium. Most often, the amount of bandwidth that can be used by a site is equal to the amount of bandwidth that can reach the site. This can be changed, however, by invoking "bandwidth throttling." Throttling allows you to reduce the amount of bandwidth the site can offer, thus leaving the server hosting the site with additional bandwidth that can be allocated to other services or other sites.
- Internet connection points – the majority of users access the Internet through ISPs.
- Audience access – the audience – the users you are publishing to – should be considered when posting. If your users are predominantly low-speed dial-up users, then files to be downloaded should be compressed, etc.
- Internet Service Provider (ISP) – ISPs access the Internet through Network Access Points (NAPs).
- Connection types – connections can be established through dial-up service, proxy service, dedicated lines (ISDN, T1, etc.), all of which are explored in later sections of the objectives.
- Corrupt files – corruption can occur at any time and prevent users from accessing your resources successfully. It is important to test your files before posting/uploading them, and to always continue to check them for corruption and correct, as needed.
- Files taking too long to load – consider the access the median audience is using to reach your site. Instead of posting one 88-page PDF file that will take forever to load, break the file into eleven 8-page segments that can be loaded individually.
- Inability to open files – can be caused by browser dependencies. Try to avoid browser dependencies whenever and wherever possible.
- Resolution of graphics – is the number of determining factor in the clarity of the graphics, and is expressed in bits: the greater the number of bits, the better the graphic. While 24-bit graphics are perfect for an ideal world, if you want to serve all users, you should use 8-bit graphics as that is as high as you can go and support the 256-color monitors still in use.

1.3 Describe the concept of caching and its implications. Content may include the following:

- Server caching –caching can be done here but requires a great deal of RAM
- Client caching – allows sites revisited to be brought to the browser quickly
- Proxy caching – allows users to access site data quicker as it is always faster to send the data at the speed of the LAN medium than at the speed of site access
- Cleaning out client-side cache – should be done on a routine basis – such as with Tweak/UI that can do so on each boot or activation – and can restore hard drive space
- Server may cache information as well
- Corrupt files
- Web page update settings in browsers – allow you to configure how often to access/cache data, etc.

1.4 Describe different types of search indexes – static index/site map, keyword index, full text index. Examples could include the following:

- Searching your site – can be graphically represented via a site map.
- Searching content – the basics of rules for searching include:

A	Finds pages with word A
B	Finds pages with word B
A B	Will find words A and words B
"A B"	Will find the words A and B together
+A B	Requires word A to be in the search results
A –B	Will find words A that do not contain words B

- Indexing your site for a search – can be accomplished with an Index server. You can exclude words from the search by creating a "noise" list.

INTERNET CLIENTS

2.1 Describe the infrastructure needed to support an Internet client. Content could include the following:

- TCP/IP stack – TCP/IP is a four-layer protocol that matches up to the seven-layer OSI model in functionality.

- Operating system - The stack is implemented differently in different operating systems, Windows-based operating systems implement it as a DLL - Winsock
- Network connection – the connection can be through any number of possibilities, including dial-up, proxy, direct
- Web browser – uses port 80 by default, and can be configured with a number of features (caching, cookie acceptance, etc.) . The most popular browsers, at this time, are Netscape and Internet Explorer – both of which run on multiple operating system platforms.
- E-mail – is commonly accessed via POP3 and sent via SMTP. This functionality can be accomplished through the browser in many cases, or other programs.
- Hardware platform (PC, WebTV, Internet phone) – the one necessity is the TCP/IP protocol.

2.2 Describe the use of Web browsers and various clients (e.g., FTP clients, Telnet clients, email clients, all-in-one clients/universal clients) within a given context of use. Examples of context could include the following:

- When you would use each – browsers are used to view the graphical content of the World Wide Web, with FTP is used to upload and download files. Both allow for anonymous access to sites, though it can be prohibited if security is a concern. Telnet sessions allow a user to establish a dumb-terminal connection to a server and run processes on the server as if he/she were sitting there instead of at the remote host. Email clients, as the name implies, are used to send and receive email. Popular email packages/clients are elm, pine, Eudora.
- The basic commands you would use (e.g., put and get) with each client (e.g., FTP, Telnet) – to place a single file on an FTP site, you use the put command. To place multiple files on an FTP site, you can use mput. To retrieve a single file from an FTP site, use get, or use mget to retrieve multiple files. With telnet, the command to initiate the session is telnet itself, the location to go to, for example:

Telnet 1.2.3.4

Or

Telnet redial.com

- Once a connection is established, you must logon to the server with a valid username and password (plain text) as if you were sitting at the server. You can end the connection a number of ways, with exit being the most common command, then close the telnet application.

2.3 Explain the issues to consider when configuring the desktop. Content could include the following:

- TCP/IP configuration (NetBIOS name server such as WINS, DNS, default gateway, subnet mask) – NetBIOS names (also known as computer names) exist in the Microsoft operating system world. NetBIOS-to-IP resolution can be done through static files (LMHOSTS) or dynamically with a Windows Internet Naming Service (WINS) server.
- As opposed to NetBIOS names (Microsoft-only), host names exist is all operating systems (Microsoft, Unix, etc.). On a small network, host name-to-IP resolution can be accomplished through the use of HOSTS files. On a large network – such as the Internet – this resolution can be accomplished via the use of Domain Name Service/Server machines. DNS servers divide the extent of their coverage area into zones, with a primary and secondary server for each.
- To configure TCP/IP on a host, you need only three values with one being that of default gateway (the other two are IP address and subnet mask). The default gateway is the IP address of the router all data not intended for this network should go to.
- A subnet mask divides the total number of hosts available for one network into a smaller number available for a number of networks. The subnet mask value is based upon the class of network you have. Default values by class, and the maximum number of hosts are:

Class Network	Default Subnet Mask	Total number of Hosts for
A	255.0.0.0	> 16 million
B	255.255.0.0	>65,000
C	255.255.255.0	254

- Host file configuration – the host file must exist on every machine that is performing host name-to-IP address resolution in order for it to work properly. It can consist of an unlimited number of lines, with each line limited to 255 characters in length. The format for the file is that the first column is an IP address, and all other columns on that line (separated by any white space – tab, space, etc.) are aliases for that IP address. The pound sign (#) anywhere on a line makes the rest of the line a comment.
- DHCP versus static IP – Dynamic Host Configuration Protocol (DHCP) servers can simplify administration of IP addresses by dynamically issuing them to clients, and not requiring them to be hardcoded by an administrator. DHCP is built on BOOTP (Boot Protocol) and leases addresses from a scope. When the leases expire, the IP addresses are placed back in the scope for use by another client. At any time, the leases can be renewed or released.
- Configuring browser (proxy configuration, client-side caching) – proxy servers can be configured to do active caching – to automatically retrieve pages that are commonly viewed and store them locally for access for users.

2.4 Describe MIME types and their components. Content could include the following:

- Whether a client can understand various types (MIME, HTML, and uuencode) – MultiPurpose Internet Mail Extensions (MIME) makes it possible to send non-ASCII files over email and have them supported on the client machine. Web browsers use MIME to understand how to display non-HTML data within the browser.
- The need to define MIME file types for special download procedures such as unusual documents or graphic formats – there are standard MIME types recognized by all, and it is possible for any user/administrator to create their own.

2.5 Identify problems related to legacy clients (e.g., TCP/IP sockets and their implication on the operating system). Content could include the following:

- When troubleshooting problems, look for revision dates, and manufacturer/vendor values and use them to determine if you have the most current software available. Troubleshooting problems and performance issues can often be tied to compatibility issues and differing versions of the Web browser.

2.6 Explain the function of patches and updates to client software and associated problems. Content could include the following:

- Patches should never be blindly applied as you run the risk of taking a working system and making changes that can adversely affect performance. When new patches become available, you should always download them and carefully read the documentation, which accompanies them. If you are experiencing none of the problems addressed by the patch, or there would be no performance gain by applying it, then do not apply it. If the patch looks beneficial, then try it on a single system first to look for problems that might arise before rolling it out to all computers.

2.7 Describe the advantages and disadvantages of using a cookie and how to set cookies. Content could include the following:

- Cookies are unencrypted text files stored on the client's computer with, or without, the user's knowledge. Cookies hold values about the user or the user's preferences (such as a shopping cart) that can be read and written to when the user accesses a site. Cookies contain expiration dates (which can be equal to none); dates last modified, last accessed, and last checked. Whether cookies are accepted without prompting or not is largely based upon the browser's security settings. In IE, you can choose to set whether cookies will:
    - Always be accepted
    - Require prompting before accepting
    - Be disabled

- In all cases, the main purpose of a cookie is identification.

DEVELOPMENT

3.1 Define programming-related terms as they relate to Internet applications development. Content could include the following:

- API – The Application Programming Interfaces are the building blocks by which Windows-based software applications are built by programmers.
- CGI – the Common Gateway Interface is a program/language that runs on servers and provides a means to customize output to the user. It is server-based and performs all operations there (versus ActiveX and Java applets which run on the client). Because a process must be initiated each time the program is run, CGI tends to be server-intensive, while ISAPI and other server-solutions can avoid spawning a new process with each iteration and not be as intensive on the server.
- SQL – the Structured Query Language is used to find/place information in a database. Using ODBC (Open DataBase Connectors), the Web server can interact with a SQL server and pull up information such as from a catalog database and post the results in HTML to the user.
- SAPI – the Speech API is used for voice and telephony applications
- DLL – Dynamic Linking Libraries are the method by which common executable routines are made available in the Windows-based environment. Drivers and executables depend upon DLLs to provide functionality that can be accessed, making programming much easier.
- Client and server-side scripting – while CGI and ISAPI are examples of server-side scripting, examples of client-side scripting can include Java applets, Active Server Pages, and ActiveX. Any execution that occurs within the browser is known as client-side programming, while any execution that occurs before data reaches the browser is known as server-side.

3.2 Describe the differences between popular client-side and server-side programming languages. Examples could include the following:

- Java – an object-oriented programming language created by Sun Microsystems that allows programs to be run in almost every operating system (via a Java Virtual Machine)
- JavaScript – created by Netscape to provide active content on web sites
- Perl – Practical Extraction and Report Language – an interpretive language (requires an interpreter) that can be used to write CGI scripts and perform text processing tasks
- C – a programming language that has been around for almost 30 years that uses a small amount of resources and can run on most operating systems
- C++ - the object-oriented counterpart to C. It is used for graphical environments and runs on most operating systems.

- Visual Basic – a graphical programming language that is event-driven. It typically requires an executable to be compiled before being able to be run on a user's machine
- VBScript – a non-compiled scripting language based on Visual Basic that allows controls to be added to web pages.
- Jscript – a non-compiled scripting language based on Microsoft's implementation of JavaScript (which came from Netscape).
- XML – eXtensible Markup Language – allows multiple HTML links (versus the standard one) and is a chopped down version of SGML (Standard Generalized Markup Language). It is useful for shopping sites and others that can have multiple results needed for an action. Many believe XML will replace HTML eventually for writing web pages.
- VRML – Virtual Reality Modeling Language – a plug-in that allows the display of 3-D objects within web browsers.
- ASP – Active Server Pages run only on the Windows NT platform and allow processing to be done on the server (which sends back pure HTML) and on the client (which is processed within the browser, but can be viewed in Source.)

3.3 Describe the differences between a relational database and a non-relational database.

- A flat-file database holds all data in one solitary table, while a relational database stores data in different tables (each of which can be in a different format). Relational databases are far more complicated than flat-file databases, but also much more flexible and scalable for big installations.

3.4 Identify when to integrate a database with a Web site and the technologies used to connect the two.

- A database should be integrated with a web site anytime you need to return values from it to the user, or input values from the user into it. In the first scenario, a database could be used to show inventory on hand when queried by partners in your extranet. In the second scenario, a database could be used to collect mailing addresses from users who want to receive your catalog.
- ODBC - Open DataBase Connector – allows the Web server to interact with a SQL server.

3.5 Demonstrate the ability to create HTML pages.

- Always employ cross-browser coding in your html, and verify compatibility between different browsers. Know that using the <UL> syntax will produce a non-ordered, non-numbered list. Using the <OL> syntax will produce a numbered and ordered list. To insert a command to run a script, use the syntax: <script language="JavaScript">.

- The correct syntax for a link to D S Technical Solutions is <A HREF="http://www.ds-technical.com">D S Technical</A>. To insert an image, the correct syntax is <IMG SRC="image.gif ">
- The "© " syntax produces the copyright symbol - ©. The <tr> syntax is used to signify rows in a table and is not a required component on all HTML pages.

3.6 Identify popular multimedia extensions or plug-ins. Examples could include the following:

- QTVR (quick time) – Created by Apple, it allows video, audio, and animation to be displayed with its strength laying in the ability to show 3-D photos and artwork
- Flash – from Macromedia, allows you to create vector-based web sites
- Shockwave – from Macromedia, it is a Netscape plug-in or an ActiveX control that allows for animation on web sites, as well as audio and video.
- Real Player – plays RealAudio and RealVideo files on the Windows and Mac operating systems
- Windows Media Player – designed by Microsoft, and does not require any additional hardware. It plays files with the extension of .AVI and support several compression methods.

3.7 Describe the uses and benefits of various multimedia file formats.

- JPEG (Joint Photographic Experts Group) compresses images smaller than GIF (Graphics Interchange Format), but GIF maintains resolution and sharpness even when compressed. GIF89a adds animation to GIF images by using multiple images in one file.
- PNG – Portable Network Graphic – files resemble GIF images but do not use the patented compression algorithm employed by GIF. PDF – Portable Document Format – files are files (typically document) that can be read on any platform with Adobe's Acrobat Reader. RTF – Rich Text Format – was created by Microsoft and allows commands such as fonts to be incorporated directly in the file.
- TIFF – Tagged Image File Format – files are highly supported bitmapped graphics files that can be any resolution. PostScript files are documents containing laser printer object-oriented command language for specifying typeface, fonts, etc. EPS – Encapsulated PostScript – is the graphics side of PostScript.
- BMP files are the default bitmapped images used in the Windows world, while MOV is the file format for movies.
- MPEG – Moving Picture Experts Group – files are compressed digital video files considered to be of higher quality than QuickTime and others. Compression is done by only saving the changes between images instead of all the images.
- AVI – Audio Video Interleave – is the format used by Microsoft's Video for Windows.

- BINHex can convert binary data into ASCII data (extension .HQX) - allowing it to be sent through email. Streaming media allows a browser to begin displaying the data as it is sent to it. With Non-streaming media, all the data must be received before processing begins.

3.8 Describe the process of pre-launch site/application functionality testing.

- Before launching a site, you must: check hot links, test different browsers, test to ensure the new site does not corrupt your e-commerce sites and that it can be accessed, perform load testing, and test with various speed connections.

NETWORKING

4.1 Describe the core components of the current Internet infrastructure and how they relate to each other. Content may include the following:

- Network access points – NAPs are how/where ISPs connect to the Internet and effectively form the backbone.
- Backbone – the main structure behind which the Internet is built.

4.2 Identify problems with Internet connectivity from source to destination for various types of servers. Examples could include the following:

- E-mail
- Slow server
- Website

4.3 Describe Internet domain names and DNS. Content could include the following:

- DNS entry types – DNS records consist of different types of information. Key among them is:

Cname	An alias name/canonical name
Mx	Mail receiver for the organization
A	System name
NS	Authoritative computer for the Domain

- Hierarchical structure – DNS is organized in such a manner with the root of the naming tree being "." and everything funneling down from it, as in bubba.ds-technical.com. which breaks out to:

.	The root server
Com	Commercial venture
ds-technical	The company
bubba	The computer in question

If bubba is the primary server for the organization and running the web server, then www.ds-technical.com becomes bubba.ds-technical.com.

- Role of root domain server – the root server is responsible for the resolution of for the organization/zone.
- Top level or original domains – edu, com, mil, net, gov, and org – exist within the United States. Outside of the United States, two letter country level domains are used, such as .UK, .au, etc.

4.4 Describe the nature, purpose, and operational essentials of TCP/IP. Content could include the following:

- What addresses are and their classifications (A, B, C, D) – see Section 1.1
- Determining which ones are valid and which ones are not (subnet masks) – subnets must be created by borrowing numbers that could be used for the address of the host to identify the address of the subnet. While some vendors differ, most require sequential use of the bits from the left to the right and prevent using all 0's or all 1's. Given that, the following become the only valid subnets for a Class C network:

Subnet Address	Maximum Number of Subnets	Maximum Number of Hosts on a Class C Network
192	2	62
224	6	30
240	14	14
248	30	6
252	62	2

254	126	Invalid
255	254	Invalid

- Public versus private IP addresses – when connecting to the Internet (meaning the world), you must have a unique IP address for every single host within the world. When you are not connecting to the world, however, then the addresses must only be unique within your network. Public addressing requires the uniqueness, while private addressing suggests that the following ranges be used:

Class of Network Desired	**Starting Address**	**Last Available Address**
A	10.0.0.0	10.255.255.255
B	172.16.0.0	172.31.255.255
C	192.168.0.0	192.168.255.255

4.5 Describe the purpose of remote access protocols. Content could include the following:

- SLIP – Serial Line Internet/Interface Protocol - the oldest line protocol of the group, it can only be used with TCP/IP, does not offer error correction or support dynamic IP addressing
- PPP – Point to Point Protocol - an enhancement to SLIP, it offers error correction, support for dynamic IP addressing, the use of protocols other than TCP/IP and password logons
- PPTP – Point to Point Tunneling Protocol - Microsoft's enhancement over PPP, it allows for secure connections over the Internet by tunneling other protocols within TCP/IP packets. An alternative to PPTP is L2F (Layer 2 Forwarding) from Cisco. Tunneling is also known as encapsulation and both PPTP and L2F are used to create Virtual Private Networks (VPNs).

4.6 Describe how various protocols or services apply to the function on a Mail system, Web system, and file transfer system. Content could include the following:

- POP3 – used for retrieving mail
- SMTP – used for sending mail
- HTTP – protocol of the web service

- FTP – used to upload and download files
- NNTP (news server) – allows subscription to news servers
- TCP/IP – protocol of the Internet
- LDAP - Lightweight Directory Access Protocol - is built on the X.500 standard and allows applications to obtain directory access and information.
- LPR – the command used to print files to the LPD service (NT) or daemon (Unix).
- Telnet – allows establishment of a dumb terminal session
- Gopher – an archaic method of seeing content on the Internet prior to WWW

4.7 Describe when to use various diagnostic tools for identifying and resolving Internet problems. Content could include the following:

- Ping – an all-purpose utility for verifying that a remote host can be reached by bouncing bytes of data to it
- WinIPCfg or IP Config– shows the IP configuration data for a Windows 95/98 system
- ARP – Address Resolution Protocol – shows the resolution between IP addresses and physical (MAC) addresses
- Trace Routing Utility – tracert – works like ping but shows the hops taken to reach the remote host
- Network Analyzer – used to analyze packets of data sent across the network
- Netstat – shows the statistics for TCP/IP on a host

4.8 Describe hardware and software connection devices and their uses. Content could include the following:

- Network interface card – (NIC) the physical entity within the host to which the networking cabling is connected
- Various types of modems including analog, ISDN, DSL, and cable:

Analog	Traditional modem – requires a single phone line for a connection and is limited in speed to around 57,600bps
ISDN	Integrated Services Digital Network, requires two phone lines, and can reach a speed around 128,000bps
DSL	Digital Subscriber Line, uses existing phone lines (copper), and is available only in certain areas. You must be within a short distance of a switching station, and speeds can reach 9Mbps
Cable	Works with the coaxial from the cable TV company and speeds is reduced with the number of users, but is approximately 2Mbps

- Modem setup and commands – most common commands are:

ATE	Answer
ATD	Dial
ATH	Hang Up
ATX	Exit

- Adapter – same as NIC
- Bridge – used to connect two (and only two) networks together. Can be used with nonroutable protocols
- Internet-in-a-box – a complete solution for Internet service
- Cache-in-a-box – available from a number of vendors, essentially a hard drive on the network for storing cache
- Hub – a device that sends all data that comes in out to all ports
- Router – used to connect multiple networks together using routing tables – requires routable protocols
- Switch – similar to a hub, but directs data which comes in only to the port it the data is intended for
- Gateway – an upper layer device that can connect dissimilar networks together for the purpose of passing application data (such as email) back and forth
- NOS – a Network Operating System – any operating system that supports networking such as NetWare, Windows NT, etc.

- Firewall – either a hardware or software entity that protects a network by stopping network traffic from passing through it. In most cases, a firewall is placed on the network to allow all internal traffic to leave the network (emails to the outside world, web access, etc.), but stop all traffic from the outside world from entering the internal network

4.9 Describe various types of Internet bandwidth technologies (link types). Content could include the following:

- T1/E1 – a T1 is a dedicated line that operates across 24 channels at 1.544Mbps. E1 is the European counterpart: it uses 32 channels and can run at 2.048Mbps
- T3/E3 – A T3 is a dedicated line of 672 channels (E3 is the European counterpart) able to run at speeds of 43Mbps
- Frame relay – a packet switching protocol supporting T1 and T3
- X.25 – a packet-switching standard widely used in WANs
- ATM – Asynchronous Transfer Mode – uses 53-byte cells for all transmissions
- DSL – see section 4.8

4.10 Describe the purpose of various servers – what they are, their functionality, and features. Content could include the following:

- Proxy –used to provide Internet access for clients, perform caching
- Mail
- Mirrored – duplicates data so that it is not lost in the event of a hardware failure
- Cache - stores data
- List – sends messages received to all members of a mailing list
- Web (HTTP) -
- News – provides subscription content
- Certificate – issues security keys
- Directory (LDAP) – allows directory listing
- E-commerce – allows for commercial transactions with security implied
- Telnet – dumb terminal sessions
- FTP – uploading and downloading of files

INTERNET SECURITY

5.1 Define the following Internet security concepts:

Access control	• Access control lists (ACLs) – reside with the resource and verify what users can access said resource • Firewalls prevent intruders from entering the network from the outside world • Packet filters do as the name implies • Proxy servers act on the behalf of the clients
Authentication	Must/should encompass: o Digital Certificates o Digital signatures o Non-repudiation (the ability to prove who sent data
Encryption	• Public and private keys use two values. The first (public) is known by all, while the second (private) is known only by the one user. This is known as asymmetric encryption (with symmetric encryption, the same key is used to encode and decode) • Secure socket layers (SSL)- allows for data to be transmitted across a secure connection • S/MIME – an enhancement to MIME that supports RSA's public-key encryption of email messages • Digital signatures – an attachment to email used to uniquely identify a sender. X.509 is the most common standard for digital certificates • Be aware of global versus country-specific encryption standards when exporting

Auditing	• Consists of: o Intrusion detection utilities o Log files o Auditing logs
SET (Secure Electronic Transactions)	a standard for using digital signatures to uniquely identify users and allow for credit card transactions over the Internet

5.2 Describe VPN and what it does.

- Virtual Private Networks are built using PPTP or other tunneling protocols to provide encrypted (secure) communications across the Internet. They are used for connecting two different company sites such as with an extranet, or for allowing a remote user to securely access a site.

5.3 Describe various types of suspicious activities.

Possible symptoms are:

- Multiple login failures
- Denial of service (DoS) attacks wherein the system is kept so busy responding to non-legitimate traffic/requests that it cannot service legitimate users.
- Mail flooding/spam (overwhelming a site with junk email)
- Ping floods - Flooding a site with ICMP echoes (also known as smurfing)
- Syn floods- when a client attempts to establish a connection with a host on TCP/IP, the first request sent is a SYN. In a Syn flood, you overwhelm a host with SYN requests for connections.

5.4 Describe access security features for an Internet server (e.g., mail server, Web server).

- Internet security access features can include the use of:
- User names and passwords – this is the minimal level of access that should be acceptable.
- File level – assigning permissions to files for access by anonymous and known users

- The use of digital certificates
- File-level access: read is needed for viewing and downloading, write is needed to modify/change/create/upload, no access cancels all other rights

5.5 Describe the purpose of anti-virus software and when to use it.

- Anti-virus software, as the name implies, identifies viruses when they enter the system and stops them from damaging data on the system. Anti-virus software can, and should, be located on both:
    - Browser/client
    - Server

5.6 Describe the differences between the following as they relate to security requirements:

- Intranet – with an Intranet, you isolate the site from the world (typically with a firewall), and do everything you can to keep outsiders from knowing the site exists or accessing it
- Extranet – with an Extranet, some of the world must know that your site exists – typically your vendors and partners – and you limit the access to only them and your internal personnel. This is best accomplished through the use of a Virtual Private Network.
- Internet – the purpose of an Internet site is for the world to know of its existence and come to it to learn of your products, data, information, and other offerings. By default, all users enter the site as the anonymous user and permissions are assigned to anonymous to affect all users

BUSINESS CONCEPTS

6.1 Explain the issues involved in copyrighting, trademarking, and licensing. Content could include the following:

- How to license copyright materials – all copyrights are done through the Library of Congress and require only filling out a few forms and submitting them with the requisite fee
- Scope of your copyright – copyrights apply to written works (versus patents for inventions and trademarks for symbols and trade names). A copyright owner has exclusive rights to the work for the life of the author plus fifty years. A fair use clause prohibits copyrighting material that cannot be construed as being unique.
- How to copyright your material anywhere – a notice of copyright ("©", or "Copyright") should clearly appear within the work and two copies should be

submitted within three months of first being "published" with the copyright office.

- Consequences of not being aware of copyright issues, not following copyright restrictions – since the copyright is good for such a lengthy duration of time, there is no justifiable reason for violating such, and repercussions can occur at any time (no statute of limitations). Penalties are determined by the legal process and can range from restitution to more severe.

6.2 Identify the issues related to working in a global environment.

When working in a global environment, consider:

- Different currencies, understanding of terms, legality of agreements, etc.
- International issues such as shipping, supply chain
- Multi-lingual or multi-character issues (Unicode). Unicode allows for – thousands of languages to be derived from within a single character set
- Legal and regulatory issues

6.3 Define the following Web-related mechanisms for audience development (i.e., attracting and retaining an audience):

- In push technology, the browser gets information pushed to it without it requesting it. In pull technology - on which most of the web is based - a user requests data before it is sent down

6.4 Describe the differences between the following from a business standpoint:

- Intranet, Extranet, and Internet– see section 5.6

6.5 Define e-commerce terms and concepts. Content could include the following:

- EDI – Electronic Data Interchange – a means of transferring data between dissimilar companies
- Business to Business
- Business to Consumer
- Internet commerce
- Merchant systems
- Online Cataloging
- Relationship management

- Customer self-service
- Internet marketing

If you have any questions, please click below:
i-Net+ Questions

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