CPET 499/ITC 250 Web Systems

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Web Server and Application Servers Integration
- Types of Servers
  - Internet servers: HTTP/HTTPs, FTP, Telnet, Telephony service, Audio and video
  - Proxy servers
  - Network servers
    - Cisco Secure Network Server, http://www.cisco.com/c/en/us/products/collateral/security/identity-services-engine/data_sheet_c78-726524.html
    - Cisco AnyConnect VPN
    - Cisco Products & Services, http://www.cisco.com/c/en/us/products/index.html
      - Technology Trends:
        - Cloud, http://www.cisco.com/web/solutions/trends/cloud/index.html
        - IoT, http://www.cisco.com/web/solutions/trends/iot/overview.html
        - Mobility, http://www.cisco.com/web/solutions/trends/mobility/index.html
        - Software Defines Networking (SDN), http://www.cisco.com/web/solutions/trends/sdn/index.html
    - Juniper VPN, SA Series, http://www.juniper.net/us/en/products-services/security/sa-series/
  - Application servers
    - IBM WebSphere Application Server, http://www-03.ibm.com/software/products/en/appserv-was
    - Microsoft Windows 2008, 2012 Servers, http://technet.microsoft.com/en-us/library/cc754133.aspx
    - Oracle WebLogic Server, http://www.oracle.com/us/products/middleware/cloud-app-foundation/weblogic/overview/index.html
  - E-commerce Server
    - WebSphere Commerce Server, http://pic.dhe.ibm.com/infocenter/mdm/v10r1/index.jsp?topic=%2Fcom.ibm.pim.acm.doc%2Fpim_acm_ref_webspherecommerce.html
    - IBM E-Commerce Software, http://www-01.ibm.com/software/genservers/commerceproductline/e-commerce_software/
  - Newsletter Server (SMTP)
    - Email Marketing Services
  - SMTP Mail Server
  - File servers
  - Print servers
  - Database servers
    - Microsoft SQL Server, 2008, 2012, 2014

- Web Content Management
  - Web Content Manager, http://www-03.ibm.com/software/products/en/ibmwebcontmana
- Enterprise Application Integration (EAI)
  - IBM Enterprise Application Integration: Time to market imperative driving investment in EAI, http://www-01.ibm.com/software/info/itsolutions/eai/timetomarket/
  - IBM Connectivity, Integration and SOA, http://www-03.ibm.com/software/products/en/category/connectivity-integration-soa
  - Tutorial 1: Enterprise Application Integration, 2010, http://msdn.microsoft.com/en-us/library/aa578030.aspx
- Enterprise Data Integration (EDI)
- CGI (Common Gateway Interface)
  - W3C CGI, http://www.w3.org/CGI/
  - CGI 1.1, 2004, http://www.ietf.org/rfc/rfc3875
- HTTP (HyperText Transfer Protocol) Protocols
  - HTTP/1.1, 1999, http://www.w3.org/Protocols/rfc2616/rfc2616.html
  - HTTP/1.1 RFC 2817: Upgrading to TLS within HTTP/1.1 (Transport Layer Security), May 2000, https://www.ietf.org/rfc/rfc2817.txt
  - HTTP/1.1 RFC 7230: Message Syntax and Routing, June 2014, https://tools.ietf.org/html/rfc7230
  - HTTP/1.1 RFC 7231: Semantics and Content, June 2014, https://tools.ietf.org/html/rfc7231
  - HTTP/1.1 RFC 7232: Conditional Requests, June 2014, https://tools.ietf.org/html/rfc7232
  - HTTP/1.1 RFC 7233: Range Requests, June 2014, https://tools.ietf.org/html/rfc7233
  - HTTP/1.1 RFC 7234: Caching, June 2014, https://tools.ietf.org/html/rfc7234
  - HTTP/1.1 RFC 7235: Authentication, June 2014, https://tools.ietf.org/html/rfc7235
  - HTTP/1.1 RFC 7236: Authentication Scheme Registrations, June 2014, https://tools.ietf.org/html/rfc7236
  - HTTP/1.1 RFC 7237: Method Registrations, June 2014, https://tools.ietf.org/html/rfc7237
- Server Configuration

Web Servers
- Web (HTTP and HTTPS) server
  - Answer requests from browsers (the client program)
  - Retrieve the specific files (or execute a CGI script)
  - Return the document or script results
  - Communicate with client via the HTTP protocol

Application Servers and Distributed Client/Server Application
- Types of Servers
  - Internet servers: HTTP/HTTPs, FTP, Telnet, Telephony service, Audio and video
  - Proxy servers
  - Network servers
  - Application servers
  - E-commerce Server

- Newsletter Server
- File servers
- Print servers
- Database servers
- Gateways and Firewalls

CGI (Common Gateway Interface)
- W3C CGI, http://www.w3.org/CGI/
- CGI 1.1, 2004, http://www.ietf.org/rfc/rfc3875
  - 1.1. Purpose
  The Common Gateway Interface (CGI) [22] allows an HTTP [1], [4] server and a CGI script to share   responsibility for responding to client requests. The client request comprises a Uniform Resource Identifier (URI) [11], a request method and various ancillary information about the request provided by the transport protocol.

  The CGI defines the abstract parameters, known as meta-variables, which describe a client's request. Together with a concrete programmer interface this specifies a platform-independent interface between the script and the HTTP server.

  The server is responsible for managing connection, data transfer, transport and network issues related to the client request, whereas the CGI script handles the application issues, such as data access and document processing.
- The Common Gateway Interface (CGI) is a standard for interfacing Web applications with information servers such as HTTP or Web servers in a platform-independent manner.
- Tasks performed by CGI scripts (programs)
  - Query database
  - Perform calculations
  - Solicit and interpret user-supplied data
  - Retrieve requested information
  - Produced customized content
- A CGI program is an executable program that resided in a special directory such as /cgi-bin. It can be written in any language: C/C++, Fortran, Perl, TCL, any UNIX shell, Visual Basic, and AppleScript.

CGI Environment Variables
A list of environment variable defined by CGI standard is as shown below:

Variables	Purpose
AUTH_TYPE	If the server supports user authentication, and the script is protects, this is the protocol-specific authentication method used to validate the user.
CONTENT_TYPE	It specifies the media type of the data for queries, which have attached information, such as HTTP POST and PUT, this is the content type of the data.
CONTENT_LENGTH	The length (number of bytes) of information passed to the script.
GATEWAY_INTERFACE	The name and version of the protocol being used by the server to communicate with the script. Format: CGI/revision

PATH_INFO	It provides any extra path information, as given in the URL, for accessing this script. The extra information is sent as PATH_INFO to be decoded by the server before it is passed to the CGI script.
PATH_TRANSLATED	It gives the absolute file system path for access the script. The server provides a translated version of PATH_INFO, which takes the path and does any virtual-to-physical mapping to it.
QUERY_STRING	Any additional information passed to the script after the ? mark in the URL which referenced this script is called the query information. It should not be decoded in any fashion.
REMOTE_HOST	It contains a fully qualified domain name of the client computer. If the host name cannot be determined, it should set REMOTE_ADDR to hold the IP address of the host and leave this variable unset.
REMOTE_ADDR	The IP address of the remote client computer making the request.
REMOTE_IDENT	The client machine's username. Usage of this variable should be limited to logging only.
SCRIPT_NAME	A virtual path to the script being executed, used for self-referencing URLs.
REMOTE_USER	The name used to authenticate the user for accessing the script.
SERVER_SOFTWARE	The name and version of the information server software answering the request (and running the gateway). # Format: name/version
SERVER_NAME	The server's hostname, DNS alias, or IP address as it would appear in self-referencing URLs.
SERVER_PROTOCOL	The name and revision of the information protocol this request came in with. Format: protocol/revision.
SERVER_PORT	The port number to which the request was sent.
REQUEST_METHOD	The method with which the request was made. For HTTP, this is "GET", "HEAD", "POST", etc.
HTTP_ACCEPT	Gives a comma-separated list of MIME types that the client can accept.
HTTP_REFERER	Provides the address of the page where the request originated.
HTTP_USER_AGENT	Specifies the name of the client program used to make the request.

Status (Error Code) for Client and Server

Client Errors Code
400   Bad Request
401   Unauthorized
402   Payment Required
403   Forbidden
404   Not Found
405   Method Not Allowed
406   Not Acceptable
407   Proxy Authentication Required
408   Request Timeout
409   Conflict
410   Gone
411   Length Required

412	Precondition Failed
413	Request Entity Too Large
414	Request-URI Too Long
415	Unsupported Media Type
416	Requested range not valid
417	Failed
418	Failed

Server Error

500	Internal Server Error
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout
505	HTTP Version Not Supported
506	Redirection failed

Web Master Tools
- Apache HTTP Server Project, http://httpd.apache.org/
- Apache Webmaster Tools & Utilities, https://www.apachelounge.com/viewforum.php?f=8
- Chapter 26, Apache HTTP Server Configuration, https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/3/html/System_Administration_Guide/ch-httpdconfig.html
- Understanding Setup in IIS 7, http://www.iis.net/learn/install/installing-iis-7/understanding-setup-in-iis
- Getting Started with the IIS Manager in IIS 7 and IIS 8, http://www.iis.net/learn/get-started/getting-started-with-iis/getting-started-with-the-iis-manager-in-iis-7-and-iis-8
- IBM HTTP Server, http://httpd.apache.org/
- Oracle HTTP Server, https://docs.oracle.com/cd/E21764_01/web.1111/e10144/intro_ohs.htm#HSADM101

Web Services and Cloud Computing
- Standards and Web Services, http://www.ibm.com/developerworks/webservices/standards/
- Amazon Web Services, http://aws.amazon.com/
  - AWS EC2 (Elastic Compute Cloud), Amazon S3 (Simple Storage Service), Commercial RDBMS