IB Case Study Vocabulary

A new computer aided dispatch system for Bangbai (2019)

Application programming interface (API) - a set of commands, functions, protocols, and objects that programmers can use to create software or interact with an external system. It provides developers with standard commands for performing common operations so they do not have to write the code from scratch.

Client side random – Load balancing is a technique used to distribute workloads uniformly across servers or other compute resources to optimize network efficiency, reliability and capacity. One approach to load balancing is to deliver a list of server IPs to the client, and then to have client randomly select the IP from the list on each connection.

Cluster - A set of loosely/tightly connected computers that work together.

Cluster of servers – is a group of linked servers, working together closely and deployed to improve performance and/or availability over that provided by a single server.

Commercial software - computer software that is produced for sale or serves commercial purpose.

Computer aided dispatch (CAD) - is a way of dispatching (sending off to specific destination) mass transit vehicles or emergency services assisted by a computer.

Cookies - small text file created by a website that is stored in the user's computer either temporarily for that session only or permanently on the hard disk (persistentcookie). Cookies provide a way for the website to recognize you and keep track of your preferences.

Custom software - software that is specially developed for some specific organization or other user. Custom software development is often considered expensive compared to off-the-shelf solutions or products.

Emergency control centre (ECC) - a building or room where control room operators receive incoming telephone calls from members of the public in need of assistance.

Emergency management information system (EMIS) - a computer database for disaster response that provides graphical, real-time information to responders.

Emergency number - short, mostly three-digit numbers that can be easily remembered and quickly dialed.

Failover – a method of protecting computer systems from failure, in which standby equipment automatically takes over when the main system fails.

Future-proof - to design software, a computer, etc. so that it can still be used in the future, even when technology changes.

Global positioning system (GPS) - A system of satellites, computers, and receivers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.

HTTP/2- the newest major version of the HyperText Transfer Protocol (HTTP) that focuses on optimizing the flow of content between clients and servers. It's fully backwards-compatible with HTTP/1.1, meaning websites will work the same with either protocol. Users of HTTP/2 see improvements in page load speed and responsiveness, while website administrators see lower resource usage. The result is a faster experience with no change to the existing functionality of the web.

Load balancing algorithm – Load balancing is a technique used to distribute workloads uniformly across servers or other compute resources to optimize network efficiency, reliability and capacity. Effective load balancers intelligently determine which device within a given server farm is best able to process an incoming data packet. Doing so requires algorithms programmed to distribute loads in a specific way. Algorithms vary widely, depending on whether a load is distributed on the network or application layer.

Multitier architecture – (often referred to as n-tier architecture) is a client–server architecture in which presentation, application processing, and data management functions are physically separated. The most widespread use of multi-tier architecture is the three-tier architecture.

Proxy server - a server that sits between a client application, such as a Web browser, and a real server. It intercepts all requests to the real server to see if it can fulfill the requests itself. If not, it forwards the request to the real server.

Real-time - describes system and hardware that are forced to react to changes where they receive data as it occurs and have to output data as it is processed.

Redundancy - a system design in which a component is duplicated so if it fails there will be a backup.

Representational state transfer (REST) – an architectural style for providing standards between computer systems on the web, making it easier for systems to communicate with each other.

Scalability / scalable architecture – refers to a system, network, or process that has been designed to handle a workload that may change in scope. Generally speaking, a computing system whose performance improves proportionally to hardware upgrades is a scalable system.

Safety-critical – Describes a system that, if ever down or provides misinformation, has the chance to endanger human lives.

Session – In computer science, in particular networking, a session is a temporary and interactive information interchange between two or more communicating devices, or between a computer and user (see login session).

Session IP hash – It is a type of neural network where networks can be access in any order instead of linear order. Sessions are a temporary connection between nodes where data is transmitted. IP hashing is a different way of sorting clients who access a server by giving each client an unique hash key where the client's order is determined from that.

Session management – is the rule set that governs interactions between a web-based application and users. Browsers and websites use HTTP to communicate, and a web session is a series of HTTP requests and response transactions created by the same user.

Socket - is one endpoint of a two-way communication link between two programs running on the network. A socket is bound to a port number so that the TCP layer can identify the application that data is destined to be sent to. An endpoint is a combination of an IP address and a port number.

Source IP hash – Source IP Hash load balancing uses an algorithm that takes the source and destination IP address of the client and server to generate a unique hash key. This key is used to allocate the client to a particular server.

Stateful / stateless / maintaining state - It refers to the way the connection is held. It refers to whether or not information is saved after the connection.

TCP/IP sockets - It is a protocol for connection-oriented applications. They are a type of socket that is used through the protocol layer in a network.

Transaction processing system (TPS) – Is a type of information system that collects, stores, modifies, and retrieves data transactions from an enterprise. They also provide a predictable response time to requests

URL rewriting – Also called URL manipulation, is the process of altering the parameters of a URL by means of a program. Allows the user to access a site that has a complicated URL by means of using a simpler URL to access it. Hackers can manipulate URLs to direct users to illegitimate sites.

Virtual private network (VPN) – A VPN extends a private network across a public network, enabling users to send and receive data over public networks as if they are on a private network. It was developed for remote users to securely access corporate applications and other resources, as data travels through secure tunnels.

Voice over internet protocol (VoIP) – Let's a group of technologies such as communications and multimedia sessions through Internet Protocol networks, such as the internet. Examples include, voice, fax, SMS, and voice messaging.

Weighted round robin - It is a network scheduling discipline, where each packet flow connection has its own queue in a network interface controller. ATM networks used this with fixed-size packets. The primary limitation of this is that is provides the correct amount of bandwidth only if the data in all of the queues are the same size or when a mean packet size is known in advance.

Zero downtime - Zero downtime describes a website without service interruption, redundancies being a major factor. Applications include a website for a major company such as Google, and cloud services such as iCloud and Google Drive.