**Information System**

**1**

IS (information system) is the collection of technical and human resources that provide the storage, computing, distribution, and communication for the information required by all or some part of an enterprise . A special form of IS is a management information system ( MIS ), which provides information for managing an enterprise.

**2**

A [combination](http://www.businessdictionary.com/definition/combination.html) of [hardware](http://www.businessdictionary.com/definition/hardware.html), [software](http://www.businessdictionary.com/definition/software.html), [infrastructure](http://www.businessdictionary.com/definition/infrastructure.html) and trained [personnel](http://www.businessdictionary.com/definition/personnel.html) [organized](http://www.businessdictionary.com/definition/organized.html) to facilitate [planning](http://www.businessdictionary.com/definition/planning.html), [control](http://www.businessdictionary.com/definition/control.html), [coordination](http://www.businessdictionary.com/definition/coordination.html), and [decision making](http://www.businessdictionary.com/definition/decision-making.html) in an [organization](http://www.businessdictionary.com/definition/organization.html).

**Advantage**  
**Globalization** - IT has not only brought the world closer together, but it has allowed the world's economy to become a single interdependent system. This means that we can not only share information quickly and efficiently, but we can also bring down barriers of linguistic and geographic boundaries. The world has developed into a global village due to the help of information technology allowing countries like Chile and Japan who are not only separated by distance but also by language to shares ideas and information with each other.   
  
**Communication** - With the help of information technology, communication has also become cheaper, quicker, and more efficient. We can now communicate with anyone around the globe by simply text messaging them or sending them an email for an almost instantaneous response. The internet has also opened up face to face direct communication from different parts of the world thanks to the helps of video conferencing.   
  
**Cost effectiveness** - Information technology has helped to computerize the business process thus streamlining businesses to make them extremely cost effective money making machines. This in turn increases productivity which ultimately gives rise to profits that means better pay and less strenuous working conditions.   
  
Bridging the cultural gap - Information technology has helped to bridge the cultural gap by helping people from different cultures to communicate with one another, and allow for the exchange of views and ideas, thus increasing awareness and reducing prejudice.   
  
**More time** - IT has made it possible for businesses to be open 24 x7 all over the globe. This means that a business can be open anytime anywhere, making purchases from different countries easier and more convenient. It also means that you can have your goods delivered right to your doorstep with having to move a single muscle.   
  
**Creation of new jobs** - Probably the best advantage of information technology is the creation of new and interesting jobs. Computer programmers, Systems analyzers, Hardware and Software developers and Web designers are just some of the many new employment opportunities created with the help of IT.   
  
  
**Disadvantages**Unemployment - While information technology may have streamlined the business process it has also crated job redundancies, downsizing and outsourcing. This means that a lot of lower and middle level jobs have been done away with causing more people to become unemployed.   
  
Privacy - Though information technology may have made communication quicker, easier and more convenient, it has also bought along privacy issues. From cell phone signal interceptions to email hacking, people are now worried about their once private information becoming public knowledge.   
  
Lack of job security - Industry experts believe that the internet has made job security a big issue as since technology keeps on changing with each day. This means that one has to be in a constant learning mode, if he or she wishes for their job to be secure.   
  
Dominant culture - While information technology may have made the world a global village, it has also contributed to one culture dominating another weaker one. For example it is now argued that US influences how most young teenagers all over the world now act, dress and behave. Languages too have become overshadowed, with English becoming the primary mode of communication for business and everything else.

**Typical Components Of Information Systems**

While information systems may differ in how they are used within an organization, they typically contain the following components:

1. **Hardware.** Computer-based information systems use computer hardware, such as processors, monitors, keyboard, and printers.

2. **Software.** These are the programs used to organize, process and analyze data.

3**. Databases**. Information systems work with data, organized into tables and files.

4**. Network.** Different elements need to be connected to each other, especially if many different people in an organization use the same information system.

5. **Procedures**. These describe how specific data are processed and analyzed in order to get the answers for which the information system is designed.

## Computer Hardware

Today even the smallest firms, as well as many households throughout the world, own or lease computers. These are usually [microcomputers](http://www.britannica.com/EBchecked/topic/380316/microcomputer), also called personal computers. Individuals may own multiple computers in the form of smart phones and other portable devices. Large organizations typically employ distributed computer systems, from powerful parallel-processing servers located in data centers to widely dispersed personal computers and mobile devices, integrated into the organizational information systems. Together with the peripheral equipment, such as magnetic or solid-state [storage](http://www.britannica.com/EBchecked/topic/567495/storage) disks, [input-output devices](http://www.britannica.com/EBchecked/topic/288883/inputoutput-device), and telecommunications gear, these constitute the hardware of information systems. The cost of hardware has steadily and rapidly decreased, while processing speed and storage capacity have increased vastly. However, hardware’s use of electric power and its environmental impact are concerns being addressed by designers.

## Computer software

Computer [software](http://www.britannica.com/EBchecked/topic/552496/software) falls into two broad classes: [system software](http://www.britannica.com/EBchecked/topic/579155/system-software) and application software. The principal system software is the [operating system](http://www.britannica.com/EBchecked/topic/429897/operating-system-OS). It manages the hardware, data and program files, and other system resources and provides means for the user to control the computer, generally via a [graphical user interface](http://www.britannica.com/EBchecked/topic/242033/graphical-user-interface-GUI) (GUI).[Application software](http://www.britannica.com/EBchecked/topic/30675/application-program) is programs designed to handle specific tasks for users. Examples include general-purpose application suites with their spreadsheet and [word-processing](http://www.britannica.com/EBchecked/topic/647951/word-processing) programs, as well as “vertical” applications that serve a specific industry segment—for instance, an application that schedules, routes, and tracks package deliveries for an overnight carrier. Larger firms use licensed applications, customizing them to meet their specific needs, and develop other applications in-house or on an outsourced basis. Companies may also use applications delivered as software-as-a-service (SaaS) over the Web. Proprietary software, available from and supported by its vendors, is being challenged by [open-source](http://www.britannica.com/EBchecked/topic/1017825/open-source) software available on the Web for free use and modification under a license that protects its future availability.

## [Telecommunications](http://www.britannica.com/EBchecked/topic/585799/telecommunication)

Telecommunications are used to connect, or network, computer systems and transmit information. Connections are established via wired or wireless media. Wired technologies include [coaxial cable](http://www.britannica.com/EBchecked/topic/123218/coaxial-cable) and [fibre optics](http://www.britannica.com/EBchecked/topic/205837/fibre-optics). Wireless technologies, predominantly based on the transmission of [microwaves](http://www.britannica.com/EBchecked/topic/380750/microwave) and [radio waves](http://www.britannica.com/EBchecked/topic/488998/radio-wave), support mobile computing. Pervasive information systems have arisen with the computing devices embedded in many different physical objects. For example, sensors such as radio frequency identification devices (RFIDs) can be attached to products moving through the supply chain to enable the tracking of their location and the monitoring of their condition. Wireless sensor networks that are integrated into the Internet can produce massive amounts of data that can be used in seeking higher productivity or in monitoring the environment.

Various computer network configurations are possible, depending on the needs of an organization. [Local area networks](http://www.britannica.com/EBchecked/topic/345541/local-area-network-LAN) (LANs) join computers at a particular site, such as an office building or an academic campus. Metropolitan area networks (MANs) cover a limited densely populated area. [Wide area networks](http://www.britannica.com/EBchecked/topic/643173/wide-area-network-WAN) (WANs) connect widely distributed data centres, frequently run by different organizations. The Internet is a network of networks, connecting billions of computers located on every continent. Through networking, users gain access to information resources, such as large databases, and to other individuals, such as coworkers, clients, or people who share their professional or private interests. Internet-type services can be provided within an organization and for its exclusive use by various intranets that are accessible through a [browser](http://www.britannica.com/EBchecked/topic/638480/browser); for example, an intranet may be deployed as an access portal to a shared corporate [document](http://www.britannica.com/EBchecked/topic/167478/document) base. To connect with business partners over the Internet in a private and secure manner, extranets are established as so-called [virtual private networks](http://www.britannica.com/EBchecked/topic/1932079/virtual-private-network-VPN) (VPNs) by encrypting the messages.

## 

## [Databases](http://www.britannica.com/EBchecked/topic/152195/database) and Data Ware Houses

Many information systems are primarily delivery vehicles for data stored in databases. A [database](http://www.britannica.com/EBchecked/topic/152195/database) is a collection of interrelated data (records) organized so that individual records or groups of records can be retrieved to satisfy various criteria. Typical examples of databases include employee records and product catalogs. Databases support the operations and management functions of an enterprise. [Data warehouses](http://www.britannica.com/EBchecked/topic/1056147/data-warehousing) contain the archival data, collected over time, that can be mined for information in order to develop and market new products, serve the existing customers better, or reach out to potential new customers. Anyone who has ever purchased something with a credit card—in person, by mail order, or over the Web—is included within such data collections.

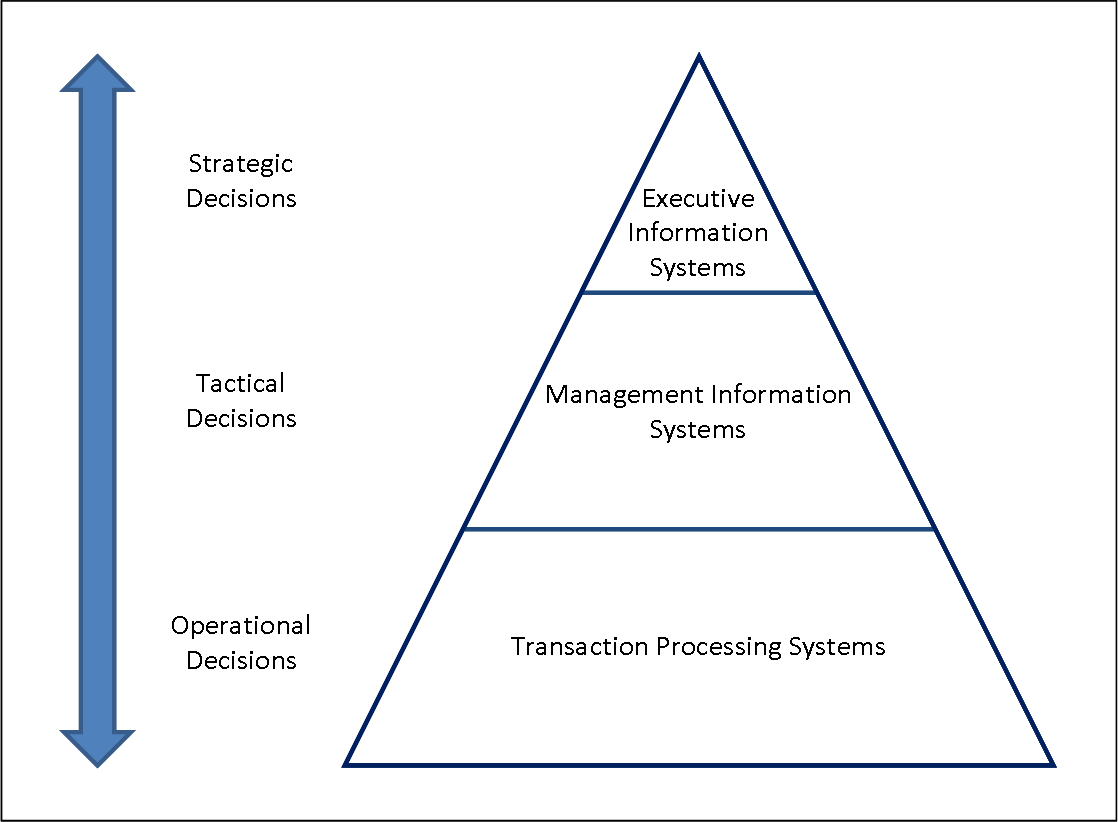
## Human resources and procedures

Qualified people are a vital component of any information system. Technical personnel include development and operations managers, business analysts, systems analysts and designers, database administrators, computer programmers, computer security specialists, and computer operators. In addition, all workers in an organization must be trained to utilize the capabilities of information systems. Billions of people around the world are learning about information systems as they use the Web.

Procedures for using, operating, and maintaining an information system are part of its [documentation](http://www.britannica.com/EBchecked/topic/167508/documentation). For example, procedures need to be established to run a payroll program, including when to run it, who is authorized to run it, and who has access to the output.

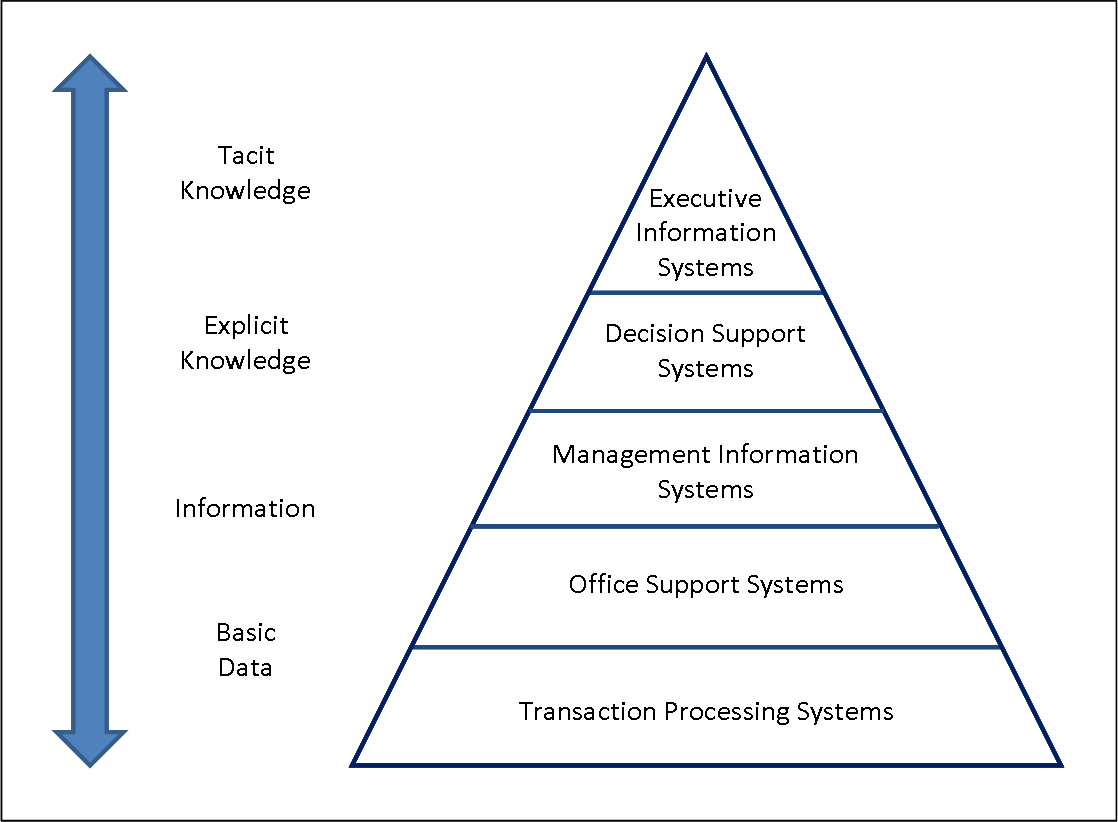
**Types of Information System**

Three level pyramid model based on the type of decisions taken at different levels in the organization.



*Three level pyramid model based on the type of decisions taken at different levels in the organization*

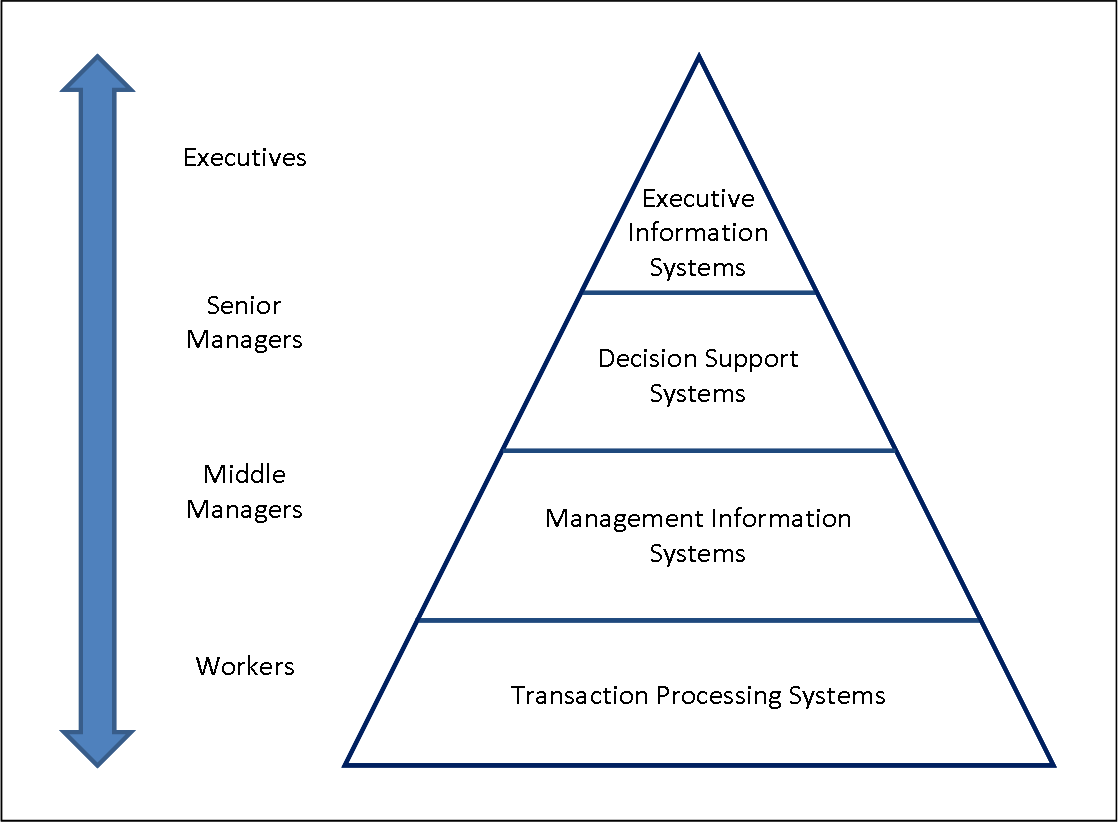
Similarly, by changing our criteria to the differnt types of date / information / knowledge that are processed at different levels in the organization, we can create a five level model.



*Five level pyramid model based on the processing requirement of different levels in the organization*

# What are the most common types of information system in an organization?

While there are several different versions of the pyramid model, the most common is probably a four level model based on the people who use the systems. Basing the classification on the people who use the information system means that many of the other characteristics such as the nature of the task and informational requirements, are taken into account more or less automatically.



*Four level pyramid model based on the different levels of hierarchy in the organization*

# A comparison of different kinds of Information Systems

Using the four level pyramid model above, we can now compare how the information systems in our model differ from each other.

## Transaction Processing Systems

Transaction Processing System are operational-level systems at the bottom of the pyramid. They are usually operated directly by shop floor workers or front line staff, which provide the key data required to support the management of operations. This data is usually obtained through the automated or semi-automated tracking of low-level activities and basic transactions.

|  |  |  |
| --- | --- | --- |
| **Functions of a TPS in terms of data processing requirements** | | |
| **Inputs** | **Processing** | **Outputs** |
| Transactions Events | Validation Sorting Listing Merging Updating Calculation | Lists Detail reports Action reports Summary reports? |

### Some examples of TPS

* + Payroll systems
  + Order processing systems
  + Reservation systems
  + Stock control systems
  + Systems for payments and funds transfers

### The role of TPS

* + Produce information for other systems
  + Cross boundaries (internal and external)
  + Used by operational personnel + supervisory levels
  + Efficiency oriented

## Management Information Systems

### What is a Management Information System?

For historical reasons, many of the different types of Information Systems found in commercial organizations are referred to as "Management Information Systems". However, within our pyramid model, Management Information Systems are management-level systems that are used by middle managers to help ensure the smooth running of the organization in the short to medium term. The highly structured information provided by these systems allows managers to evaluate an organization's performance by comparing current with previous outputs.

### Functions of a MIS

MIS are built on the data provided by the TPS

|  |  |  |
| --- | --- | --- |
| Functions of a MIS in terms of data processing requirements | | |
| **Inputs** | **Processing** | **Outputs** |
| Internal Transactions Internal Files Structured data | Sorting Merging Summarizing | Summary reports Action reports Detailed reports |

### Some examples of MIS

* + Sales management systems
  + Inventory control systems
  + Budgeting systems
  + Management Reporting Systems (MRS)
  + Personnel (HRM) systems

### The role of MIS

* + Based on internal information flows
  + Support relatively structured decisions
  + Inflexible and have little analytical capacity
  + Used by lower and middle managerial levels
  + Deals with the past and present rather than the future
  + Efficiency oriented?

## Decision Support Systems

### What is a Decision Support System?

A Decision Support System can be seen as a knowledge based system, used by senior managers, which facilitates the creation of knowledge and allow its integration into the organization. These systems are often used to analyze existing structured information and allow managers to project the potential effects of their decisions into the future. Such systems are usually interactive and are used to solve ill structured problems. They offer access to databases, analytical tools, allow "what if" simulations, and may support the exchange of information within the organization.

### Functions of a DSS

DSS manipulate and build upon the information from a MIS and/or TPS to generate insights and new information.

|  |  |  |
| --- | --- | --- |
| **Functions of a DSS in terms of data processing requirements** | | |
| **Inputs** | **Processing** | **Outputs** |
| Internal Transactions Internal Files External Information? | Modeling Simulation Analysis Summarizing | Summary reports Forecasts Graphs / Plots |

### Some examples of DSS

* + Group Decision Support Systems (GDSS)
  + Computer Supported Co-operative work (CSCW)
  + Logistics systems
  + Financial Planning systems
  + Spreadsheet Models?

### The role of DSS

* + Support ill- structured or semi-structured decisions
  + Have analytical and/or modeling capacity
  + Used by more senior managerial levels
  + Are concerned with predicting the future
  + Are effectiveness oriented?

## Executive Information Systems

### What is an EIS?

Executive Information Systems are strategic-level information systems that are found at the top of the Pyramid. They help executives and senior managers analyze the environment in which the organization operates, to identify long-term trends, and to plan appropriate courses of action. The information in such systems is often weakly structured and comes from both internal and external sources. Executive Information System are designed to be operated directly by executives without the need for intermediaries and easily tailored to the preferences of the individual using them.

### Functions of an EIS

EIS organizes and presents data and information from both external data sources and internal MIS or TPS in order to support and extend the inherent capabilities of senior executives.

|  |  |  |
| --- | --- | --- |
| **Functions of a EIS in terms of data processing requirements** | | |
| **Inputs** | **Processing** | **Outputs** |
| External Data Internal Files Pre-defined models | Summarizing Simulation "Drilling Down" | Summary reports Forecasts Graphs / Plots |

### Some examples of EIS

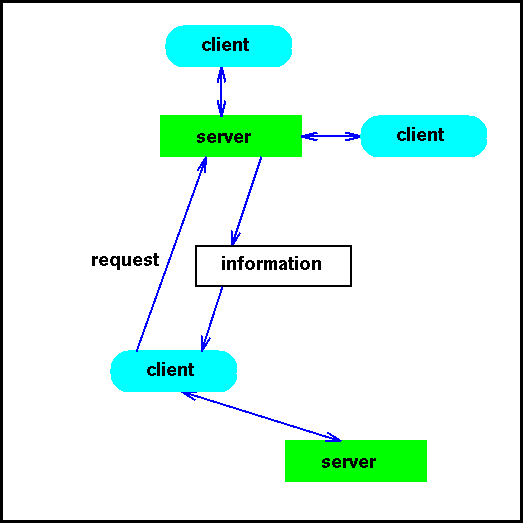
Executive Information Systems tend to be highly individualized and are often custom made for a particular client group; however, a number of off-the-shelf EIS packages do exist and many enterprise level systems offer a customizable EIS module.

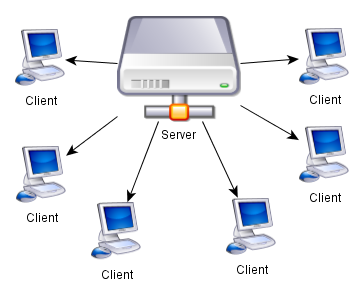
### The role of EIS

* + Are concerned with ease of use
  + Are concerned with predicting the future
  + Are effectiveness oriented
  + Are highly flexible
  + Support unstructured decisions
  + Use internal and external data sources
  + Used only at the most senior management levels

**ADVANCED INFORMATION SYSTEM**

**Definition - What does Client-Server Model mean?**





The client-server model is a distributed communication framework of network processes among service requestors, clients and service providers. The client-server connection is established through a network or the Internet.  
  
The client-server model is a core network computing concept also building functionality for email exchange and Web/database access. Web technologies and protocols built around the client-server model are:

* **Hypertext Transfer Protocol (HTTP)**
* **Domain Name System (DNS)**
* **Simple Mail Transfer Protocol (SMTP)**
* **Telnet**

Clients include Web browsers, chat applications, and email software, among others. Servers include Web, database, application, chat and email, etc.

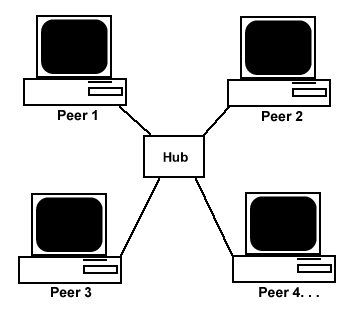
**Techopedia explains *Client-Server Model***

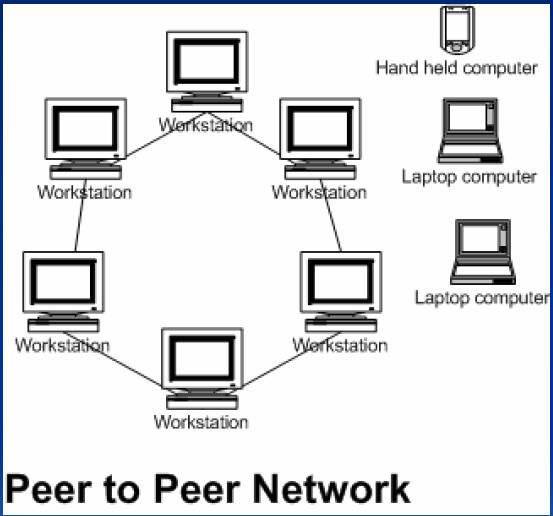
A server manages most processes and stores all data. A client requests specified data or processes. The server relays process output to the client. Clients sometimes handle processing, but require server data resources for completion.

The client-server model differs from a peer-to-peer (P2P) model where communicating systems are the client or server, each with equal status and responsibilities. The P2P model is decentralized networking. The client-server model is centralized networking.

One client-server model drawback is having too many client requests underrun a server and lead to improper functioning or total shutdown. Hackers often use such tactics to terminate specific organizational services through distributed denial-of-service (DDoS) attacks.

# What is Peer Networking?





Peer-to-peer networking is a serverless networking technology that allows several network devices to share resources and communicate directly with each other. This technology is available for Windows XP with Service Pack 1 (SP1) and later clients that run the Advanced Networking Pack for the Peer-to-Peer Infrastructure.

The Peer-to-Peer Infrastructure is a set of networking APIs to help you develop decentralized networking applications that use the collective power of computers on a network. For example, peer-to-peer applications can be collaborative communications, content distribution technologies, and so on.

The Peer-to-Peer Infrastructure provides a solid networking infrastructure so that you can concentrate on developing applications, because the infrastructure is developed for you.

The Peer-to-Peer Infrastructure includes the following major components:

* [Scalable and secure peer name resolution](http://msdn.microsoft.com/en-us/library/windows/desktop/dd433192(v=vs.85).aspx#pnrp)
* [Efficient multipoint communication](http://msdn.microsoft.com/en-us/library/windows/desktop/dd433192(v=vs.85).aspx#multi)
* [Distributed data management](http://msdn.microsoft.com/en-us/library/windows/desktop/dd433192(v=vs.85).aspx#data)
* [Secure peer identities](http://msdn.microsoft.com/en-us/library/windows/desktop/dd433192(v=vs.85).aspx#ids)
* [Secure Peer-to-Peer groups](http://msdn.microsoft.com/en-us/library/windows/desktop/dd433192(v=vs.85).aspx#groups)

# Scalable and Secure Peer Name Resolution

The [Peer Name Resolution Protocol (PNRP) Namespace Provider API](http://msdn.microsoft.com/en-us/library/windows/desktop/aa371699(v=vs.85).aspx)is a name-to-IP resolution protocol. The IPv6 scope or context that includes all participating peers is called a [cloud](http://msdn.microsoft.com/en-us/library/windows/desktop/aa370990(v=vs.85).aspx). PNRP allows peers to interact with each other within a cloud.

# Efficient Multipoint Communication

The Peer-to-Peer Infrastructure includes the [Graphing API](http://msdn.microsoft.com/en-us/library/windows/desktop/aa371025(v=vs.85).aspx) that provides efficient multipoint communication. Like PNRP, peer-to-peer graphing allows a set of nodes to interact, and pass data to and from each other in the form of a [record](http://msdn.microsoft.com/en-us/library/windows/desktop/aa371706(v=vs.85).aspx). Each record that a peer generates or updates is sent to all nodes in a graph.

# Distributed Data Management

Distributed data management automatically stores all records sent to a peer-to-peer graph until the specified expiration time for each record. Peer-to-peer networking ensures that each node in a peer-to-peer graph has a similar view of the record database. If a peer-to-peer graph has a security model associated with it, the graph contains the following information:

Who can and cannot connect to a graph

Who can secure and validate records based on externally defined criteria

# Secure Peer Identities

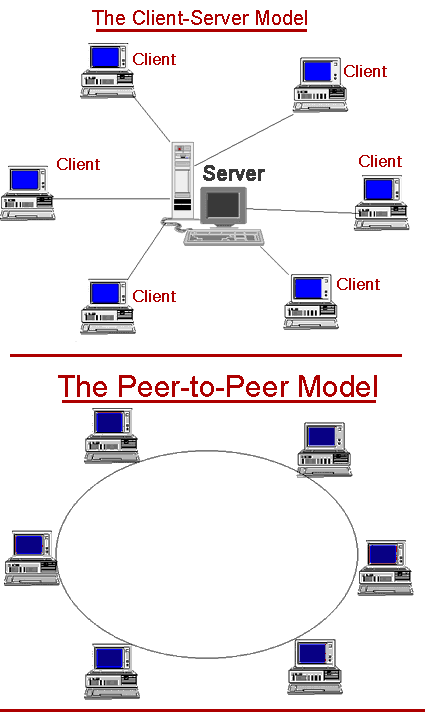
The Peer-to-Peer Infrastructure provides a Peer-to-Peer [Identity Manager API](http://msdn.microsoft.com/en-us/library/windows/desktop/aa371038(v=vs.85).aspx) that allows you to create, manage, and manipulate the peer identities. Peer identities are used to define names for secure endpoints in PNRP, and can represent any resource that participates in a peer-to-peer network, including secure peer-to-peer groups and services.

# Secure Peer-to-Peer Groups

The Peer-to-Peer [Grouping API](http://msdn.microsoft.com/en-us/library/windows/desktop/aa371031(v=vs.85).aspx) combines the Peer-to-Peer Graphing, Identity Manager, and PNRP APIs to form a cohesive and convenient solution for peer-to-peer networking application development. The Peer-to-Peer Grouping API uses the Peer-to-Peer Identity Manager API and a self-signed certificate scheme to ensure security within the graphing infrastructure. Each group can be resolved and registered through PNRP, which allows for the name resolution of random peers within a registered peer-to-peer group. A group can be an endpoint in PNRP, just like a peer.

For an overview of the Peer-to-Peer Infrastructure, see the article "[Introduction to Windows XP Peer-to-Peer Networking](http://go.microsoft.com/fwlink/p/?linkid=84441)".

**Difference Between P2P and Client Server Model**



**Web-based information** displays many benefits of multimedia technology. Using today's fast broadband connections, it is possible to stream sophisticated content to a computer anywhere in the world. This is an advantage for many people as the information can be received and read wherever and whenever it is convenient for them, which can be a crucial factor for a busy executive. A significant amount of interactive multimedia content is now delivered via the internet.

**Web information system,** **or web-based information system**, is an [information system](http://en.wikipedia.org/wiki/Information_system) that uses [Internet](http://en.wikipedia.org/wiki/Internet) [web](http://en.wikipedia.org/wiki/World_Wide_Web) technologies to deliver information and services, to users or other information systems/applications. It is a [software](http://en.wikipedia.org/wiki/Software) system whose main purpose is to publish and maintain data by using [hypertext](http://en.wikipedia.org/wiki/Hypertext)-based principles.

A web information system usually consists of one or more [web applications](http://en.wikipedia.org/wiki/Web_application), specific functionality-oriented components, together with information components and other non-web components. [Web browser](http://en.wikipedia.org/wiki/Web_browser) is typically used as [front-end](http://en.wikipedia.org/wiki/Front_end_processor_(program)) whereas[database](http://en.wikipedia.org/wiki/Database) as [back-end](http://en.wikipedia.org/wiki/Back-end).