

# THE OSI MODEL • WORKING WITH COMPUTERS

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Read this text and complete the blank spaces in the summary below.

## THE OSI (OPEN SYSTEMS INTERCONNECTION) MODEL

The OSI model defines internet working in terms of a vertical stack of seven layers. The upper layers of the OSI model represent software that implements network services like encryption and connection management. The lower layers of the OSI model implement more primitive, hardware-oriented functions like routing, addressing and flow control.

The OSI model was introduced in 1984. Although it was designed to be an abstract model, the OSI model remains a practical framework for today's key network technologies like Ethernet and protocols like IP.

The OSI model should be used as a guide for how data is transmitted over the network. It is an abstract representation of the data pathway.

The OSI model was specifically made for connecting open systems. These systems are designed to be open for communication with almost any other system. The model was made to break down each functional layer so that overall design complexity could be lessened. The model was constructed with seven layers for the flow of information. These are:

- application layer
- presentation layer
- session layer
- transport layer
- network layer
- data link layer
- physical layer.

**1. Application layer.** It provides a means for the user to access information on the network through an application. This layer is the main interface for the user to interact with the application and therefore the network. The application layer is the OSI layer closest to the end user, which means that both the OSI application layer and the user interact directly with the software application.

**2. Presentation layer.** It manages the presentation of the information in an ordered and meaningful manner. This layer's primary function is the syntax and semantics of the data transmission. It converts local host computer data representations into a standard network format for transmission on the network. On the receiving side, it changes the network format into the appropriate host computer's format so that data can be utilized independent of the host computer. ASCII and EBCDIC conversions, cryptography and the like are handled here.



**3. Session layer.** It coordinates dialogue/session/connection between devices over the network. This layer manages communications between connected sessions. Examples of this layer are token management (the session layer manages who has the token) and network time synchronization. The session layer establishes, manages and terminates communication sessions. Communication sessions consist of service requests and service responses that occur between applications located in different network devices. These requests and responses are coordinated by protocols implemented at the session layer.

**4. Transport layer.** It is responsible for reliable transmission of data and service specification between hosts. The major responsibility of this layer is data integrity, i.e., it ensures that data transmitted between hosts is reliable and timely. Upper layer datagrams<sup>1</sup> are broken down into network-sized datagrams if needed and then implemented using appropriate transmission control. The transport layer creates one or more than one network connection, depending on conditions. This layer also handles what type of connection will be created. Two major transport protocols are the TCP (Transmission Control Protocol) and the UDP (User Data gram Protocol).

**5. Network layer.** It is responsible for the routing of data (packets) through the network; it handles the addressing and delivery of data. This layer provides for congestion control, accounting information for the network, routing, addressing and several other functions. IP (Internet Protocol) is a good example of a network layer protocol. Network layer does not deal with lost messages.

**6. Data link layer.** It provides for the reliable delivery of data across a physical network. This layer deals with issues such as flow regulation, error detection and control, and frames. This layer has the important task of creating and managing what frames are sent out on the network. The network data frame, or packet, is made up of check-sum, source address, destination address and the data itself. The largest packet size that can be sent defines the Maximum Transmission Unit (MTU).

**7. Physical layer.** It handles the bit-level electrical/light communication across the network channel. The physical layer defines the electrical, mechanical, procedural and functional specifications for activating, maintaining and deactivating the physical link between communicating network systems. Physical layer specifications define characteristics such as media, voltage levels, timing of voltage changes, physical data rates, maximum transmission distances and physical connectors. Basically, this layer ensures that a bit sent on one side of the Network is received correctly on the other side.

## SUMMARY

The OSI model defines internet working in terms of a vertical ..... of seven layers: the upper layers represent software that implements network services, the lower layers implement more hardware-oriented functions.

The OSI model was introduced in 1984 and was designed to be an ..... model but it remains a practical framework for today's key network technologies.

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<sup>1</sup> A **datagram** is a basic transfer unit associated with a packet-switched network in which the delivery, arrival time and order of arrival are not guaranteed by the network service.



The OSI model is an abstract representation of the data .....

The OSI model was made for connecting ..... systems. Each functional layer can lessen the overall ..... complexity. The model was constructed with seven layers for the ..... of information. These are:

**1. Application layer.** It provides a means for the user to access information on the ..... through an application. This layer is the main ..... for the user to interact with the application and therefore the network.

**2. Presentation layer.** It manages the presentation of the information in an ordered and meaningful manner. This layer's primary function is the ..... and semantics of the data transmission. It converts local host computer data representations into a standard network ..... for transmission on the network. On the receiving side, it changes the network format into the appropriate host computer's format so that data can be utilized ..... of the host computer.

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### JOB DETAILS

As one of the UK's leading suppliers of Satellite Communications technology, our clients have developed an excellent reputation for quality within the industry. With headquarters in Hampshire, the company are experiencing great expansion above market trends and are now seeking to recruit a technical sales person to cover their Eastern UK territory.

Digital Product Manager  
£35,000 basic, £45,000 + OTE<sup>1</sup>  
Fully Comprehensive Package<sup>2</sup>

Based SE UK

(London, South east, Surrey, Hampshire, Berkshire, Home Counties, Bedfordshire, Hertfordshire, Buckinghamshire, Oxfordshire, West Sussex, East Sussex, Kent, Dorset, Wiltshire, Gloucestershire, Bristol).

Either home-based or from the Hampshire offices, your role will be a mixture of business development and account management nationwide (although the majority of business is located in the SE). You will be specialist to our clients Sat Comms product arena, but also tasked with promoting the company as a whole.

The role requires an individual with relevant industry experience, preferably broad knowledge across the Satcomms specialism. You will focus on the following products: RF, Modems, Antennae, Base Band, Video Compression, IP over Satellite. You will have a technical bent to support your sales experience.

Key Words: RF, RFI, radio frequency, satellite, broadcast, microwave, digital components, ground stations, telecom, test and measurement, equipment, timing, satcomms, communications, avionics, broadcast, datacoms, defence, energy, telecoms, sat comms, satellite communications, satcomms, ground station equipment, fixed.

- a. What type of job is being offered in this ad?
- b. What type of company is offering the job?
- c. Are they seeking to recruit a technical sales person to cover their Western UK territory?
- d. What are the two main tasks required?
- e. What kind of specialism is required?
- f. What kind of experience is required?

1 **OTE** is an acronym for On Target Earnings. This represents the total package a person will get if they meet their targets. It implies that there is a variable portion of the package that is dependent on performance.

2 **Fully Comprehensive Package:** *pacchetto kasko*.

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*Read these suggestions about a job interview. Match each question with the relative suggestion. A-1 is given as a way of example.*

- a. Welcome to the UK Engineering Recruitment Interview Questions. Please do take time to read through this page, you have put in a lot of work to get to the interview!
  - b. Tell me about yourself...
  - c. What are your strengths?
  - d. What are your weaknesses?
  - e. Do you have any questions about our company?
  - f. Where do you expect your career to be in 10 years?
  - g. What skills do you have that would benefit our company?
  - h. Why did you leave your last job?
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1. Your career may depend on how you will answer these questions...
  2. This is not an opening to speak badly of your former employer. There is almost always a way of wording the explanation so that you do not sound like a "problem employee" and your former employer does not sound like an undesirable company.
  3. Be careful here. You do not want to give the impression that you're simply using this company as a stepping stone to another career. Think of a related managerial position within the company that would interest you.
  4. If you really enjoy new challenges and tackle them in an organized manner, this would be a useful strength in almost any situation.
  5. If your skills are not exactly those that the company may have requested, you can point out the skills you have that would be valuable to any company. Examples of these skills are: your ability to plan and execute long-term projects, your ability to organize information into usable data, your ability to research complicated issues, or your ability to work well with a team.
  6. If you have paid attention during the interview and if you have done your homework, this would be a good time to ask for more details about some aspect of the company's organizational structure or products. It would not be a good time to ask about your first raise. You could also ask questions about the community, their training program or details about the work environment.
  7. Your answer should contain much more about your job skills than your personal life.
  8. A "good" weakness might be that you have trouble leaving the office behind when you go home in the evenings.

Computer language design is just like a stroll in the park. Jurassic Park, that is.

