

## What is the OSI Model?

The OSI model is a reference model which most IT professionals use to describe networks and network applications.

The OSI model was originally intended to describe a complete set of production network protocols, but the cost and complexity of the government processes involved in defining the OSI network made the project unviable. In the time that the OSI designers spent arguing over who would be responsible for what, TCP/IP conquered the world.

## The Seven Layers of the OSI Model

The seven layers of the OSI model are:

Layer	Name
7	<a href="#">Application</a>
6	<a href="#">Presentation</a>
5	<a href="#">Session</a>
4	<a href="#">Transport</a>
3	<a href="#">Network</a>
2	<a href="#">Data Link</a>
1	<a href="#">Physical</a>

The easiest way to remember the layers of the OSI model is to use the handy mnemonic "All People Seem To Need Data Processing":

Layer	Name	Mnemonic
7	Application	All
6	Presentation	People
5	Session	Seem
4	Transport	To
3	Network	Need
2	Data Link	Data
1	Physical	Processing

The functions of the seven layers of the OSI model are:

## Layer Seven of the OSI Model

The Application Layer of the OSI model is responsible for providing end-user services, such as file transfers, electronic messaging, e-mail, virtual terminal access, and network management. This is the layer with which the user interacts.

### **Layer Six of the OSI Model**

The Presentation Layer of the OSI model is responsible for defining the syntax which two network hosts use to communicate. Encryption and compression should be Presentation Layer functions.

### **Layer Five of the OSI Model**

The Session Layer of the OSI model is responsible for establishing process-to-process communications between networked hosts.

### **Layer Four of the OSI Model**

The Transport Layer of the OSI model is responsible for delivering messages between networked hosts. The Transport Layer should be responsible for fragmentation and reassembly.

### **Layer Three of the OSI Model**

The Network Layer of the OSI model is responsible for establishing paths for data transfer through the network. Routers operate at the Network Layer.

### **Layer Two of the OSI Model**

The Data Link Layer of the OSI model is responsible for communications between adjacent network nodes. Hubs and switches operate at the Data Link Layer.

### **Layer One of the OSI Model**

The Physical Layer of the OSI model is responsible for bit-level transmission between network nodes. The Physical Layer defines items such as: connector types, cable types, voltages, and pin-outs.

### **The OSI Model vs. The Real World**

The most major difficulty with the OSI model is that it does not map well to the real world!

The OSI was created after many of today's protocols were already in production use. These existing protocols, such as TCP/IP, were designed and built around the needs of real users with real problems to solve. The OSI model was created by academicians for academic purposes.

The OSI model is a very poor standard, but it's the only well-recognized standard we have which describes networked applications.

The easiest way to deal with the OSI model is to map the real-world protocols to the model, as well as they can be mapped.

Layer	Name	Common Protocols
7	Application	<a href="#">SSH</a> , telnet, <a href="#">FTP</a>
6	Presentation	HTTP, SMTP, <a href="#">SNMP</a>
5	Session	RPC, Named Pipes, NETBIOS
4	Transport	<a href="#">TCP</a> , <a href="#">UDP</a>
3	Network	IP
2	Data Link	<a href="#">Ethernet</a>
1	Physical	Cat-5

The difficulty with this approach is that there is no general agreement as to which layer of the OSI model to map any specific protocol. You could argue forever about what OSI model layer SSH maps to.

A much more accurate model of real-world networking is the TCP/IP model:

<b>TCP/IP Model</b>
Application Layer
Transport Layer
Internet Layer
Network Interface Layer

The most significant downside with the TCP/IP model is that if you reference it, fewer people will know what you are talking about!