

Open Systems Interconnection (OSI)

By

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OSI

- The Open System Interconnection (OSI) model includes a set of protocols that attempt to define and standardization the data communication process.
- The OSI model is a concept that describes, how data communications should take place.
- It divides the process into seven steps called layers.

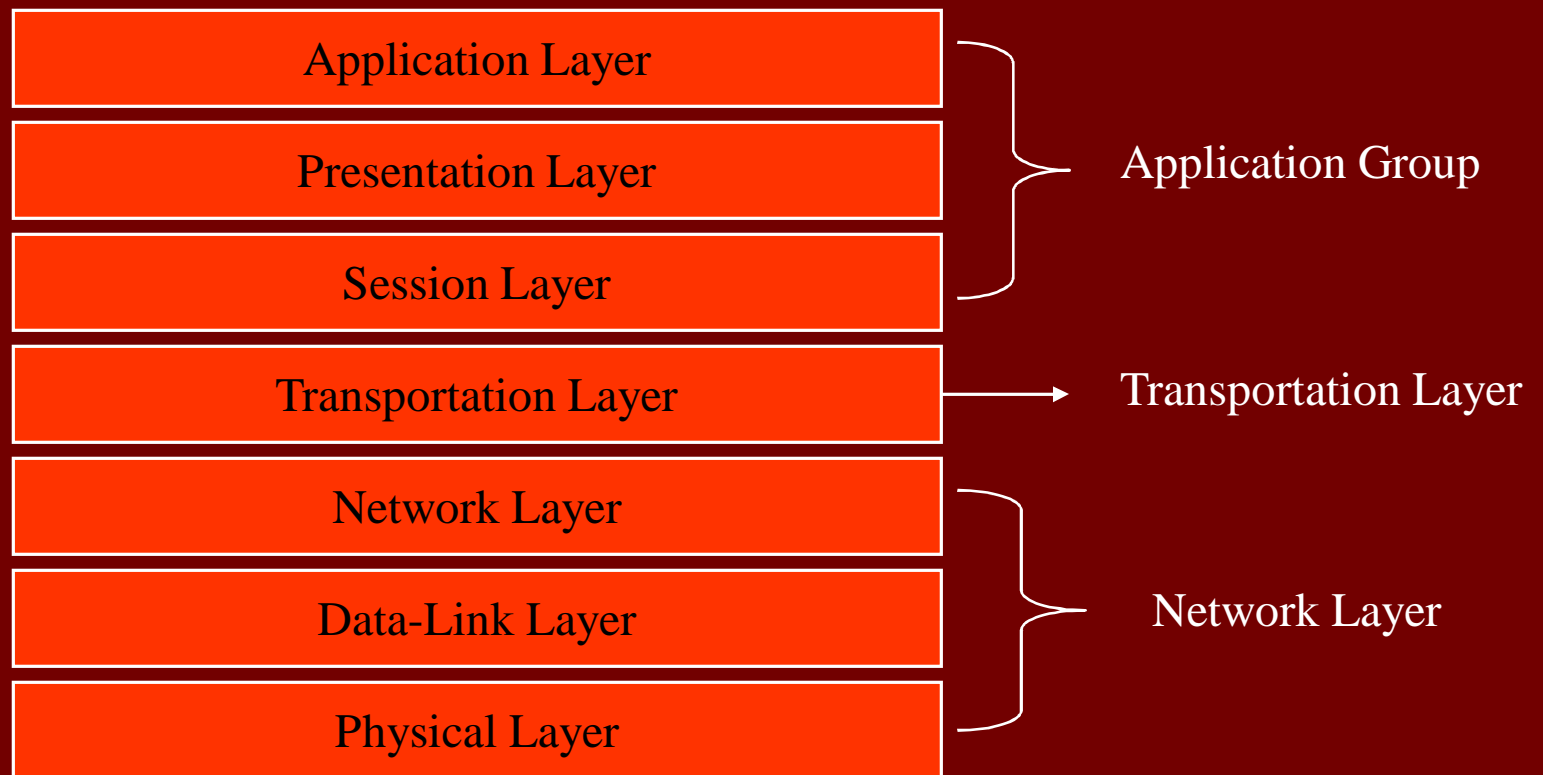
History of OSI

- The OSI protocols were defined by the International Standard Organization (ISO).
- In the beginning of 1983 OSI model developed by representatives of major computer and telecommunication companies.
- The seven layers are fitted the protocol standard developed by the ISO and other standards bodies, including the IEEE, ANSI and ITU, formerly known as the CCITT (Comite Consultatif International Telephonique Telegraphique)
- OSI was officially adopted as an International Standard by ISO.

OSI Architecture

- According to OSI document [ISO7498], the purpose of OSI is as follows:
 - "The purpose of this International Standard Reference Model of Open Systems Interconnection is to provide a common basis for the coordination of standards development for the purpose of system interconnection, while allowing existing standards to be placed into perspective within the overall Reference Model."

OSI Groups



Cont...

- Three main groups of OSI model . The OSI model consists of seven layer is further grouped according to their function into three groups;
- Network Group
- Transport group
- Network group

Network Group

- The network group is made up of the physical, data-link, and network layer.

Transport Group

- The transport group consists of a single layer, the transport layer

Application Layer

- The application group is consists of the session, presentation and application layer.

OSI Layers

- **Physical Layer**
- **Data-Link Layer**
- **Network Layer**
- **Transport Layer**
- **Session Layer**
- **Presentation Layer**
- **Application Layer**

Physical Layer



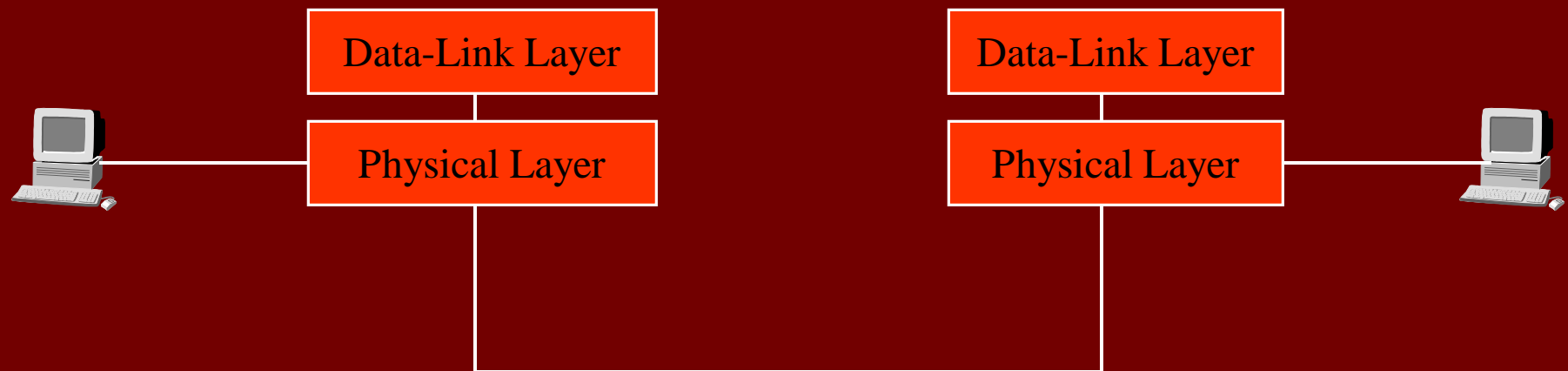
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- This is lowermost layer of the OSI model. It provides the electrical and mechanical interface to the network medium (cable).
- This layer consists of simply the wire or media by which the network signals are conducted. Physical layer includes hardware (wire, plugs and sockets etc).

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- In other words, this layer represent the physical aspects of the network such as cable and connectors.
- The basic functions of this layer are handles voltages, electrical pulses, connectors and switches so that data can be transmitted from one network device to another.

Data-Link Layer



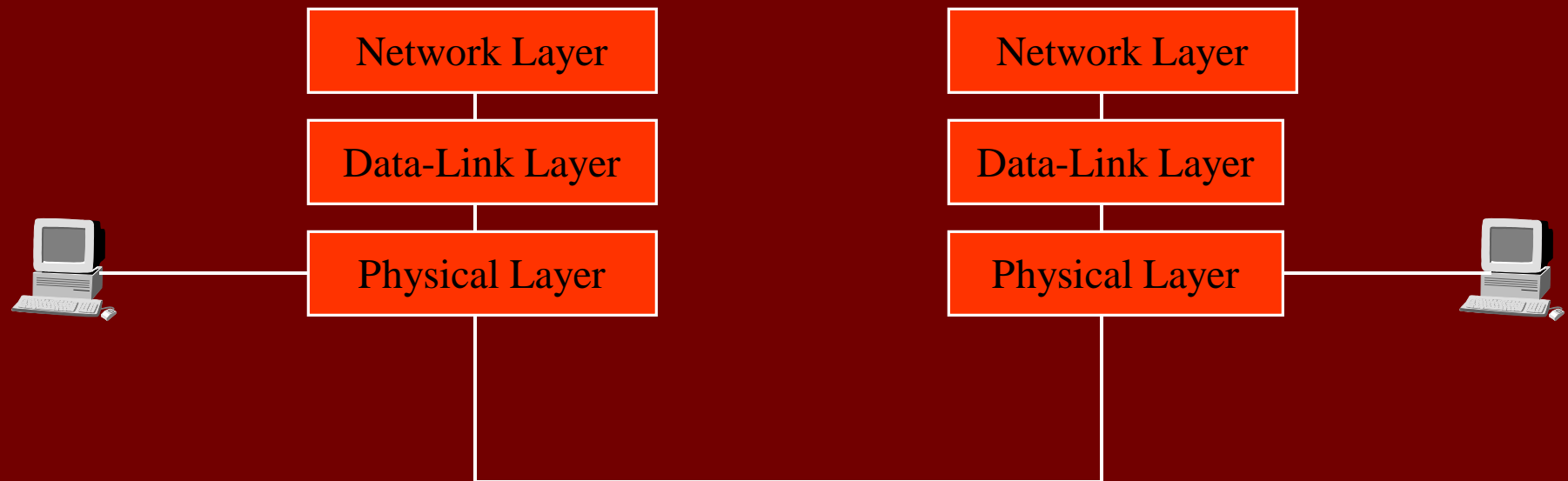
Data-Link Layer

- This is the second layer of OSI model. The data link layer is responsible for getting the data packaged from the physical layer.
- The data link layer is often subdivided into two parts Logical Link Control (LLC) and Medium Access Control (MAC).

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- The main function of this layer are handles the physical transfer, framing (the assembly of data into a single unit or block), flow control and error-control functions over a single transmission link.
- The data link layer provides the network layer (layer 3).

Network Layer



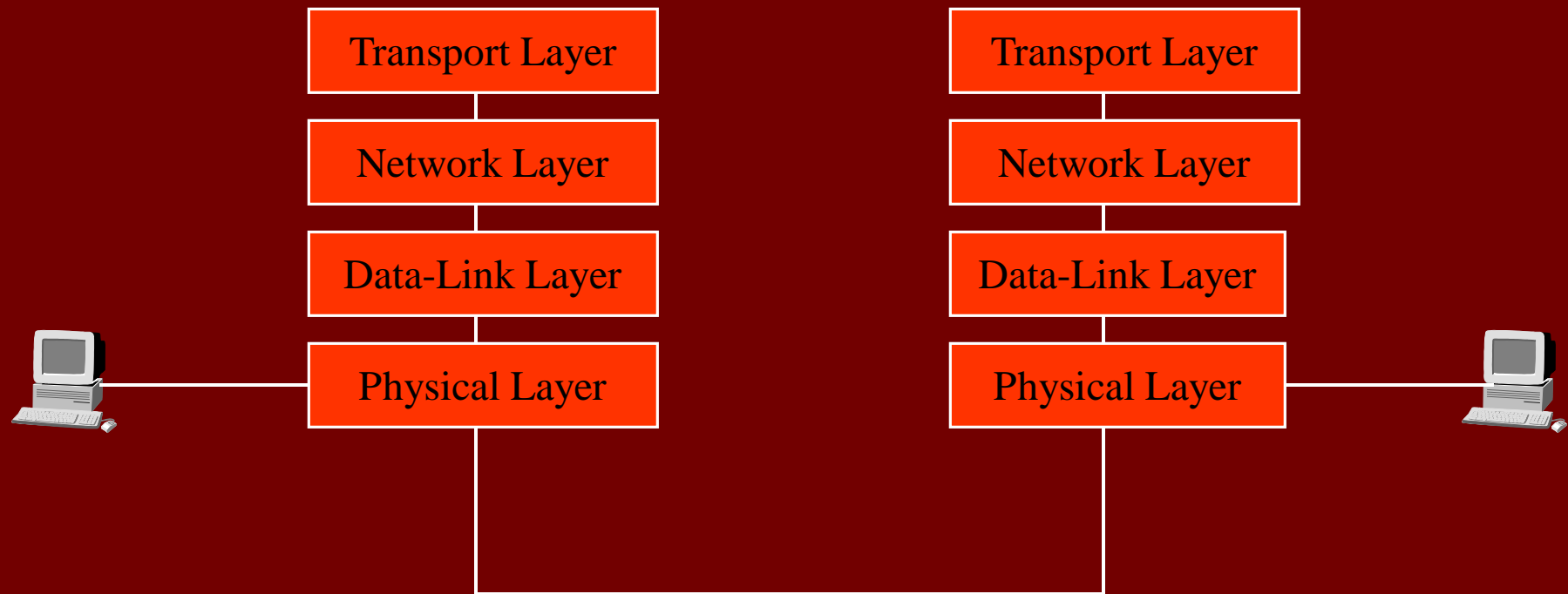
Network Layer

- It is the third layer of OSI model.
- This layer establishes the route between the sending and receiving stations.

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- It handles the routing of data (sending in the right direction to the right destination on outgoing transmissions and receiving incoming transmission at the packet). The layer does routing & forwarding of data.
- In this layer use the Internet protocol (IP).

Transport Layer



Transport Layer

- It is fourth layer of OSI model. It is responsible for constructing stream of data packets, sending and checking for correct delivery.
- This layer manages the end to end control (for example determining whether all packets have arrived) and error checking.

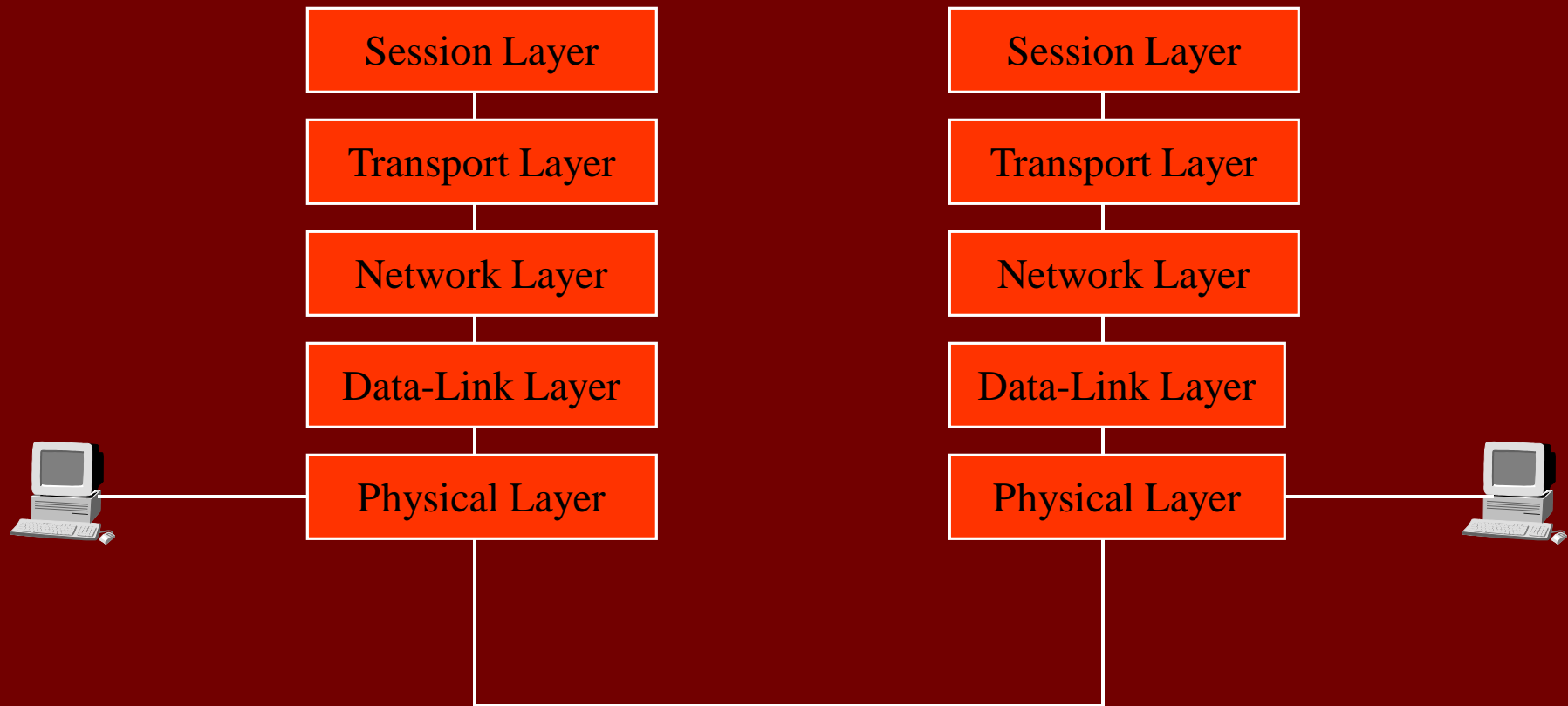
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- The transport layer ensures data is successfully sent and received between two nodes.
- If data is sent incorrectly, this layer has the responsibility to ask for retransmission of the data.

Cont...

- Specially it provides a reliable network independent message interchange service to the application group.
- This layer acts as an interface between the bottom and top three layers.
- In this layer use of TCP & UDP (User Datagram Protocol).

Session Layer



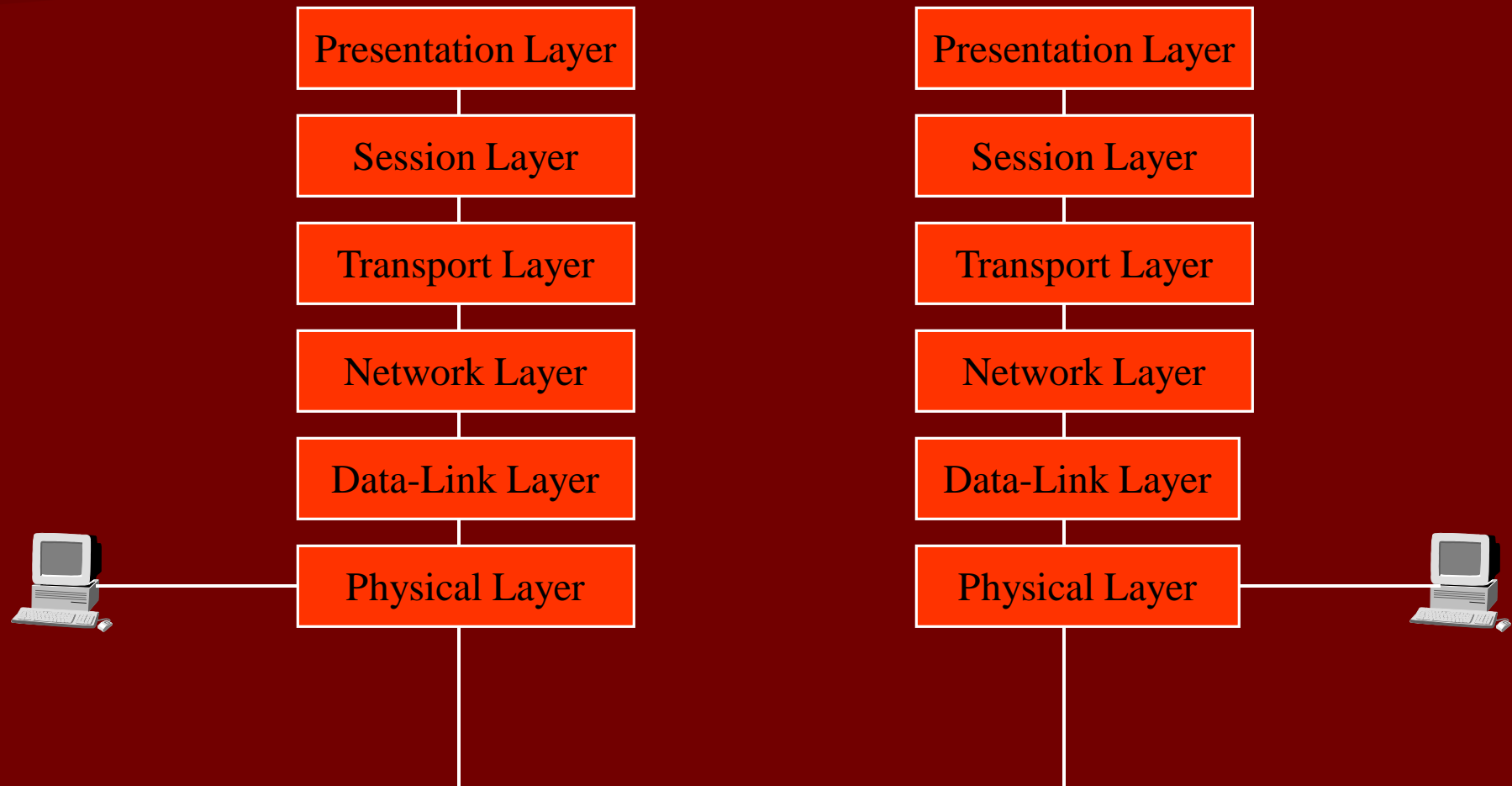
Session Layer

- This is the fifth layer of OSI. It sets up and clear communication channels between two communicating component.
- The session layer decides when to turn communication on and off between two computer- it provides the mechanisms that control the data exchange process and coordinates the interaction between them.

Cont...

- It provides coordination of the communication in an ordering manner.
- It determines one way and two way communications and manage the dialogue between both parties.
- In this layer uses of POP, TCP/IP protocols.

Presentation Layer



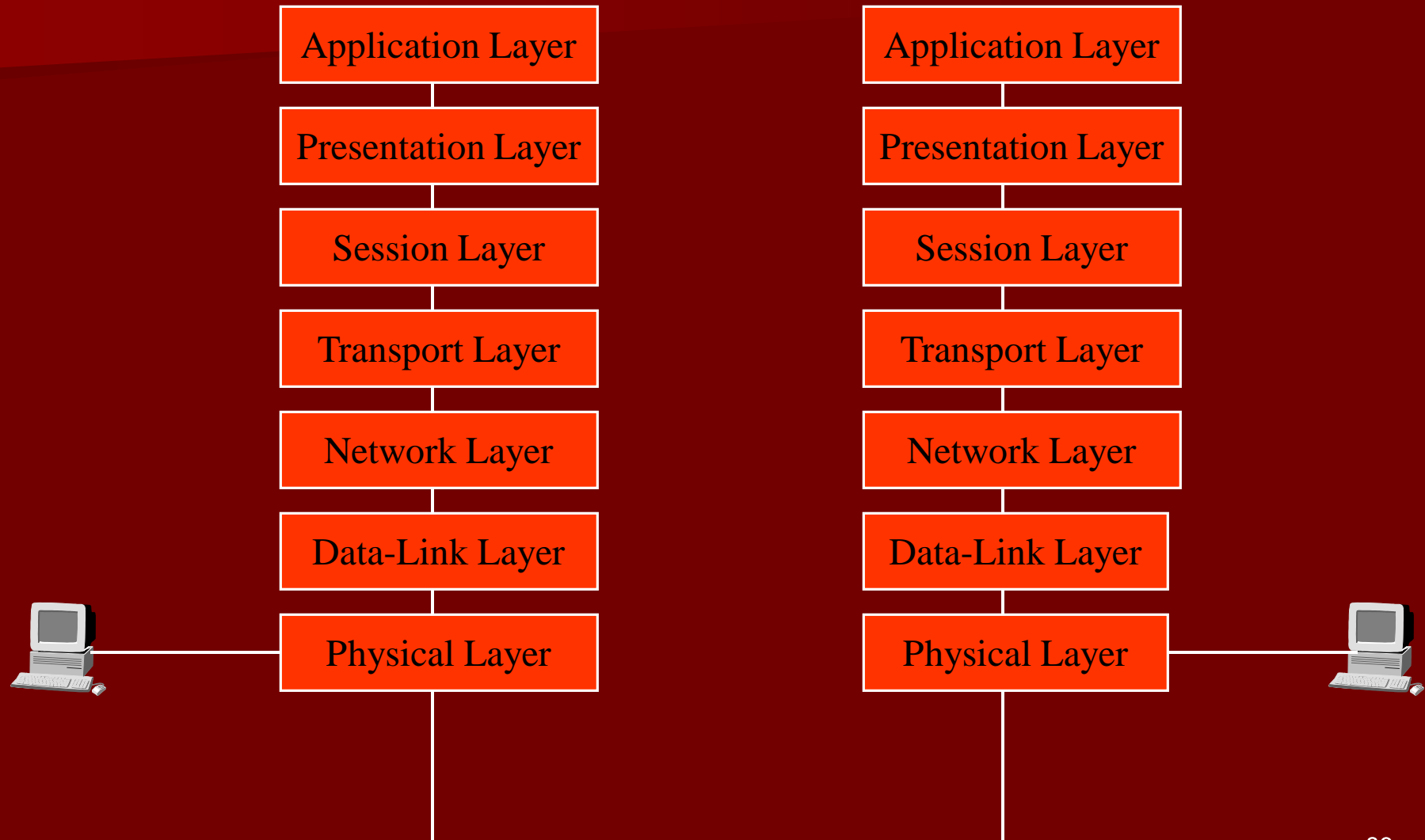
Presentation Layer

- This is the sixth or second last layer of OSI model. This layer defines how the system provides files and services in a uniform way to application.
- This layer can in some ways be considered the function of the operating system.

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- When data is transmitted between different types of computer systems, the presentation layer negotiates and manages the way data is represented and encoded.
- In this layer POP, SMTP, FTP protocol are use.

Application Layer



Application Layer

- This is topmost or last layer of OSI model. This layer defines the languages that programs use to communicate with other programs.
- Common functions of this layer are opening, closing, reading and writing files, transferring files and e-mail message, executing remote jobs and obtaining directory information about network resources.

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- It provides the interface between the software running in a computer and the network.
- In this layer provides functions to users software, including E-mail, web application, File Transfer Access and Management (FTAM), Directory services, network management.

Conclusion

OSI is a Reference Model