

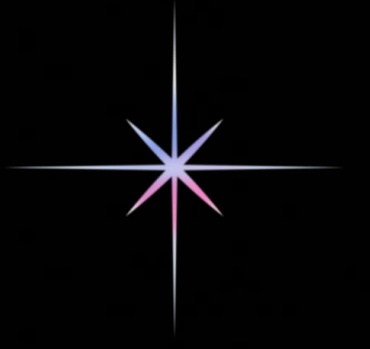


SESSION LAYER

P R E S E N T A T I O N



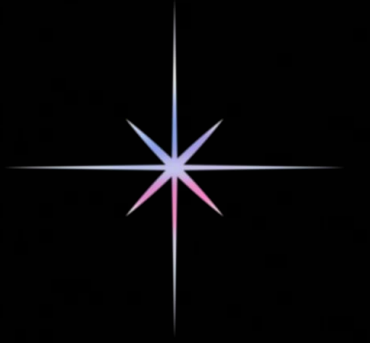
Definition



The Session Layer is the fifth layer of the OSI (Open Systems Interconnection) model, responsible for establishing, maintaining, synchronizing, and terminating communication sessions between applications on different devices. It ensures that data exchange occurs efficiently and reliably by managing connections and handling session recovery in case of failures.



Background Context

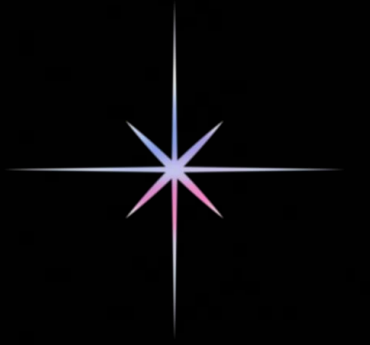


- The OSI model was developed by the International Organization for Standardization (ISO) in 1984 to standardize communication protocols.
 - The Session Layer was introduced to manage inter-process communication between devices.
- It acts as an intermediary between the Transport Layer (Layer 4) and the Presentation Layer (Layer 6) to ensure continuous and reliable communication.





Key Points of Session Layer



MANAGE SESSIONS

AUTHENTICATION AND AUTHORIZATION

SYNCHRONIZATION

SESSION RECOVERY

DIALOG CONTROL

PROTOCOL SUPPORT

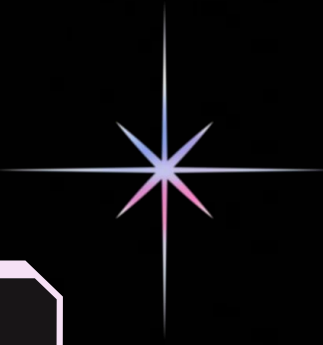
Purposes of the Session Layer

Session
Establishment,
Maintenance,
and
Termination

Synchroniz
ation for
Long Data
Transfers

Dialog
Control

Security
(Authentication
&
Authorization)



Applications of the Session Layer



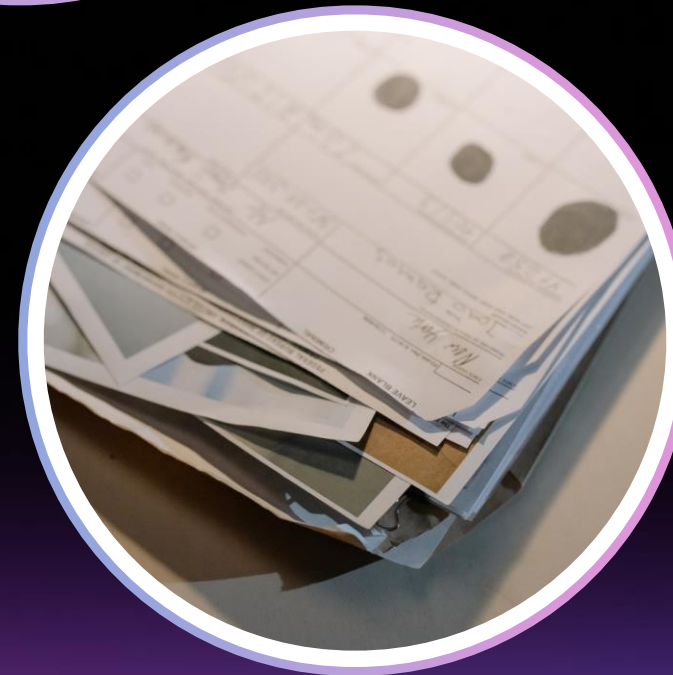
Video Conferencing & VoIP (Zoom, Skype, Teams)



Online Banking & E-Commerce Transactions



Web Browsing (HTTP Sessions & Cookies)



File Transfer & Sharing (FTP, SMB, NFS)



Applications of the Session Layer



**Remote Desktop
& VPNs**



**Multiplayer
Online Gaming**



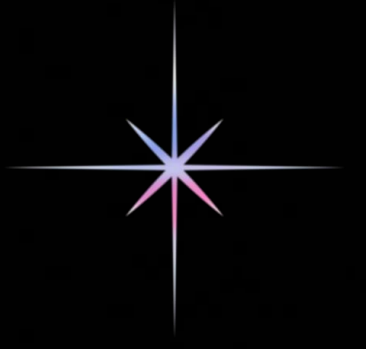
**Cloud
Computing &
SaaS
Applications**



**IoT (Internet of
Things)
Communication**

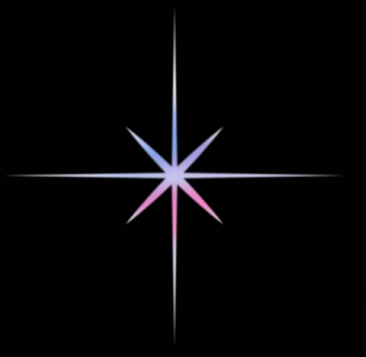


Difference between Session Layer and other OSI Layers



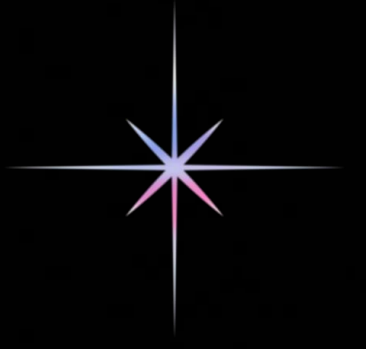
Layer	Function	Key Difference from Session Layer
Physical (1)	Transmits raw bits over a physical medium.	Deals with hardware, while the Session Layer deals with software-level session management.
Data Link (2)	Provides error detection and MAC addressing.	Works at the frame level, whereas the Session Layer works at session management.
Network (3)	Handles IP addressing and routing.	Focuses on delivering packets, while the Session Layer ensures session reliability.

Difference between Session Layer and other OSI Layers



Layer	Function	Key Difference from Session Layer
Transport (4)	Provides reliable data transfer (TCP/UDP).	Manages flow control and reliability, but the Session Layer ensures sessions are established and synchronized.
Session (5)	Manages sessions, synchronization, and authentication.	Controls when and how sessions occur.

Difference between Session Layer and other OSI Layers



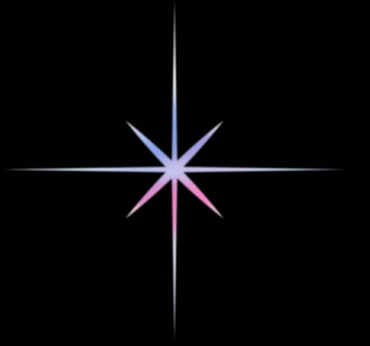
Layer	Function	Key Difference from Session Layer
Presentation (6)	Formats, encrypts, and compresses data.	Converts data into a readable format, while the Session Layer manages the connection.
Application (7)	Provides user-facing services (email, web browsing).	The closest layer to the user, whereas the Session Layer works in the background to maintain sessions.



Challenge Faced by the Session Layer

1. Network Interruptions & Session Recovery
2. Security Risks (Session Hijacking & Unauthorized Access)
3. High Latency & Synchronization Issues
4. Session Overload & Scalability Issues
5. Incompatibility Between Different Protocols
6. Session Expiry & Timeout Management
7. Dependency on Lower Layers (Transport & Network Layers)

Conclusion: Importance of Session Layer



The Session Layer plays a crucial role in communication by managing and maintaining application sessions. It ensures reliable, synchronized, and secure interactions between devices and applications. Without this layer:

- Sessions would be disrupted after minor interruptions.
- Authentication for secure communications would be more difficult.
- Data transfer would lack proper synchronization, leading to inefficiencies.



THANK YOU!

