



OSI MODEL

Computer Basics Series

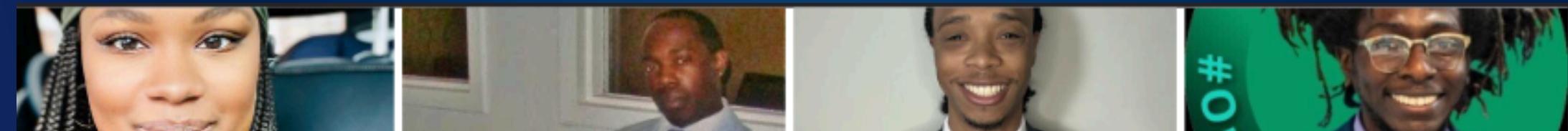
Week 4 - OSI Model Presentation- Team 1



Introduction

Presented by: Team 1, Week 4 - Computer OSI Team

Exploring the OSI Model for Modern Networking



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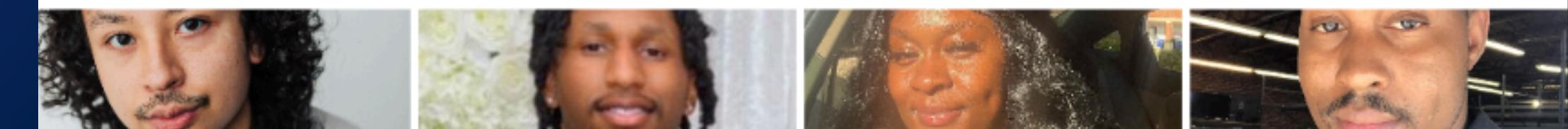


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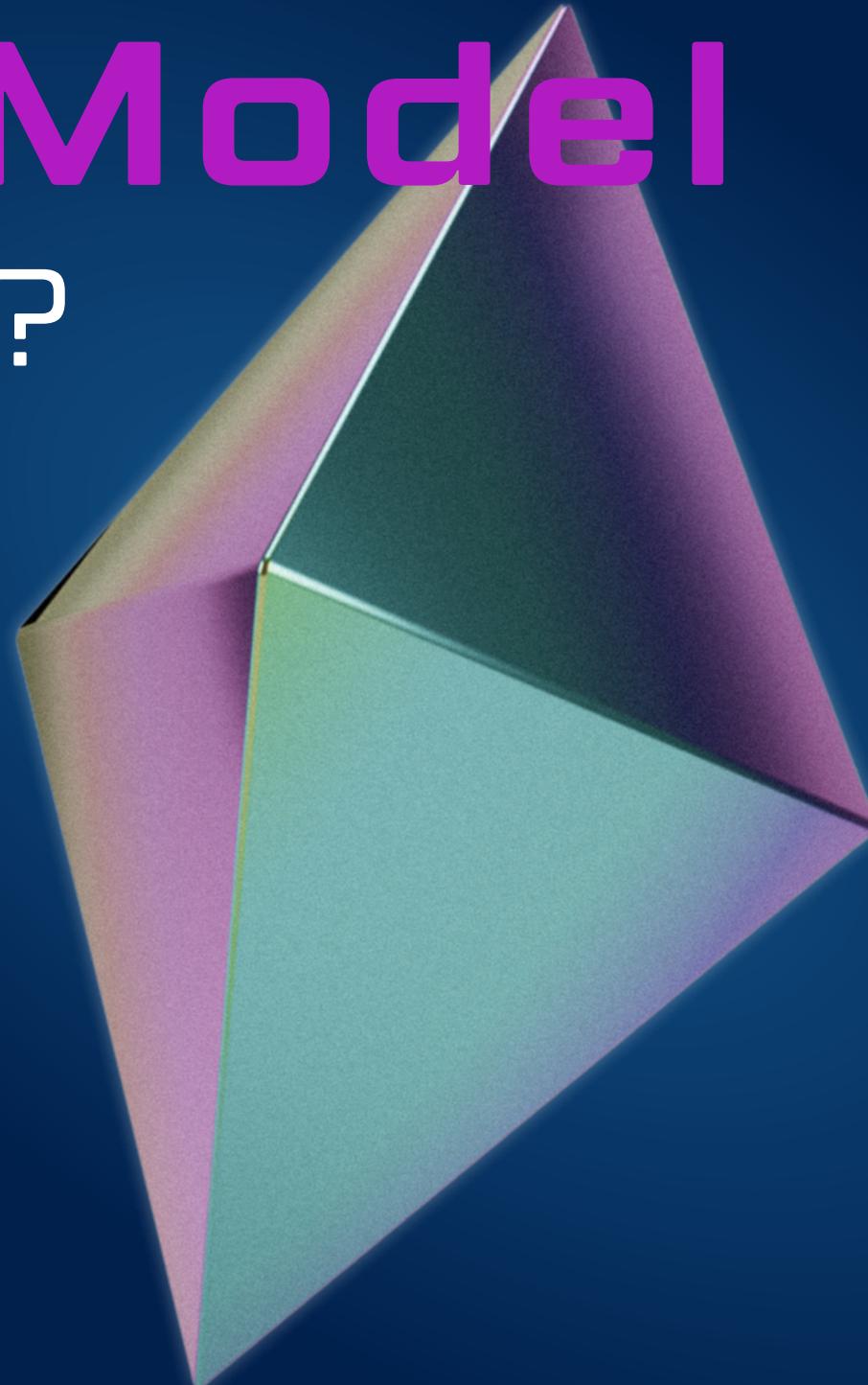


Meet the OSI Model

What is the OSI Model?

Bullet Points:

- Developed by ISO for standardizing network communications.
- A 7-layer reference that guides how data travels from one device to another.
- The “virtual blueprint” for network protocols and device communication.





The 7-Layer Roadmap

The Seven Layers at a Glance

Bullet Points:

1. Physical
2. Data Link
3. Network
4. Transport
5. Session
6. Presentation
7. Application





Physical Layer (Layer 1)



Physical Layer: The Foundation

Bullet Points:

- Handles transmission of raw bits over a physical medium (cables, radio waves).
- Examples: Ethernet cables, fiber optics, Wi-Fi radio signals.
- Primary concerns: voltage levels, connectors, pin layouts, data rates.



Part I: Layers Closest to Hardware



Data Link Layer (Layer 2) Local Neighborhood Delivery

Packages

Packages raw bits into “frames” for node-to-node transfer.

Error Correction

Handles error detection/correction, MAC addressing.

Examples

Example protocols: Ethernet (MAC address), Wi-Fi (802.11).



Network Layer (Layer 3)

The Global Navigation

Bullet Points:

- Handles logical addressing (IP addresses) and packet routing between networks.
- Routers operate here, deciding best paths for data.
- Example protocols: IPv4, IPv6.





Transport Layer (Layer 4)

Reliable Delivery

Segments data and ensures reliable or unreliable transport (TCP vs. UDP).

Provides flow control, error checking, and re-transmissions if needed (TCP).

Ports help direct traffic to the correct application or service.





Session Layer (Layer 5)

The Connection Manager



Bullet Points:

- Opens, maintains, and closes communication sessions between applications.
- Coordinates when each side talks.
- Think of logging in/out of a remote server or conferencing software.

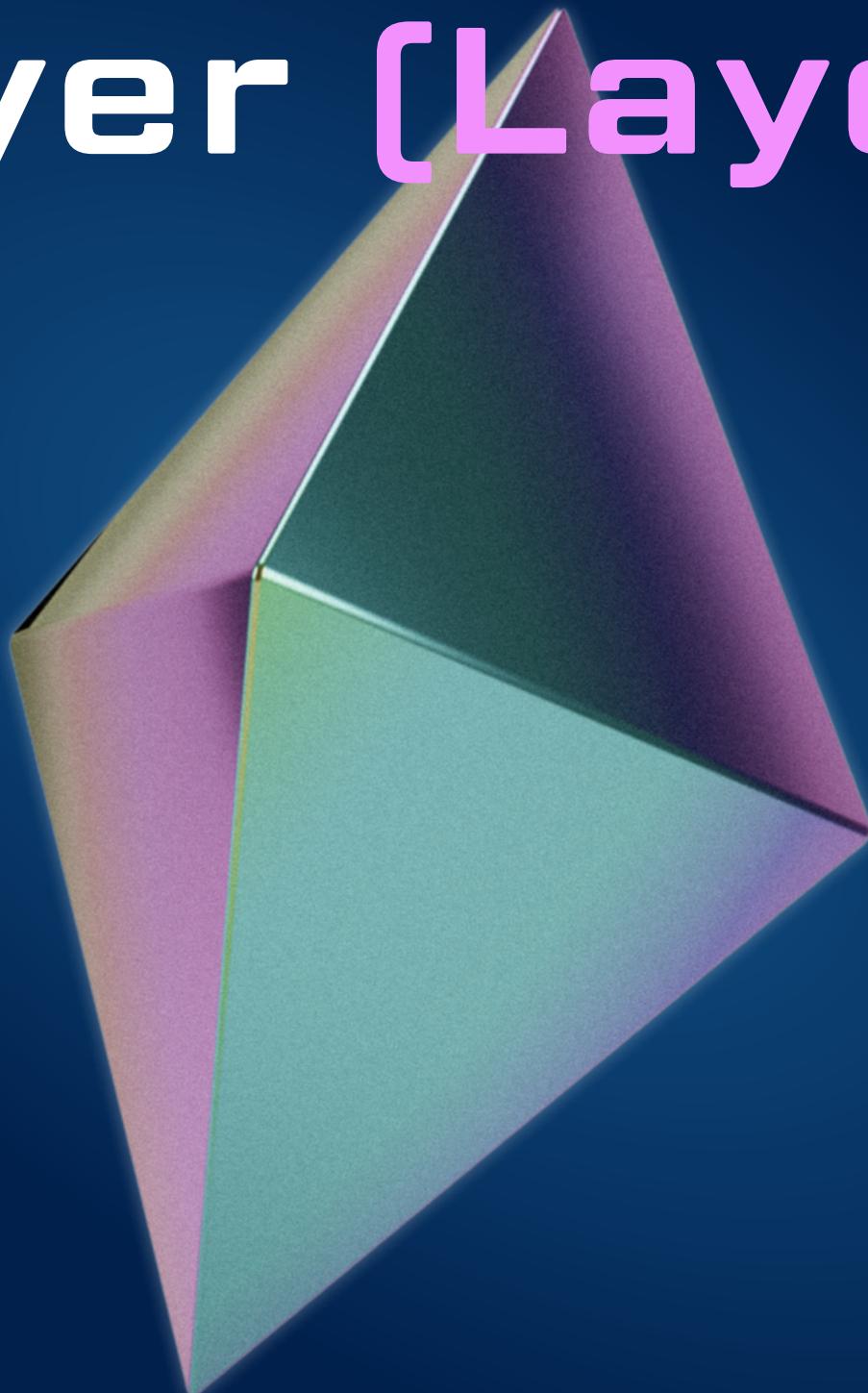


Presentation Layer (Layer 6)

Data Formatting & Encryption

Bullet Points:

- Translates data into standardized formats (e.g., ASCII, Unicode).
- Handles encryption/decryption, compression, and other transformations.
- Ensures data is “presentable” to the receiving application.





Application Layer [Layer 7]

Where Users Interact

Bullet Points:

- Provides services for end-user applications (email, web browsers, file transfers).
- Protocols: HTTP, FTP, SMTP, and more.
- Closest layer to the actual user experience (but not the application itself—just the interface to network services).





Real-World Applications OSI in Today's Networks

Web Browsing

Physical (Wi-Fi/Ethernet) → Data Link (MAC) → Network (IP) → Transport (TCP/UDP) → Session (HTTP sessions) → Presentation (encryption, HTML formatting) → Application (Browser).

Troubleshooting

Helps network admins isolate which layer is causing an issue (Layer 1 cable vs. Layer 3 routing, etc.).

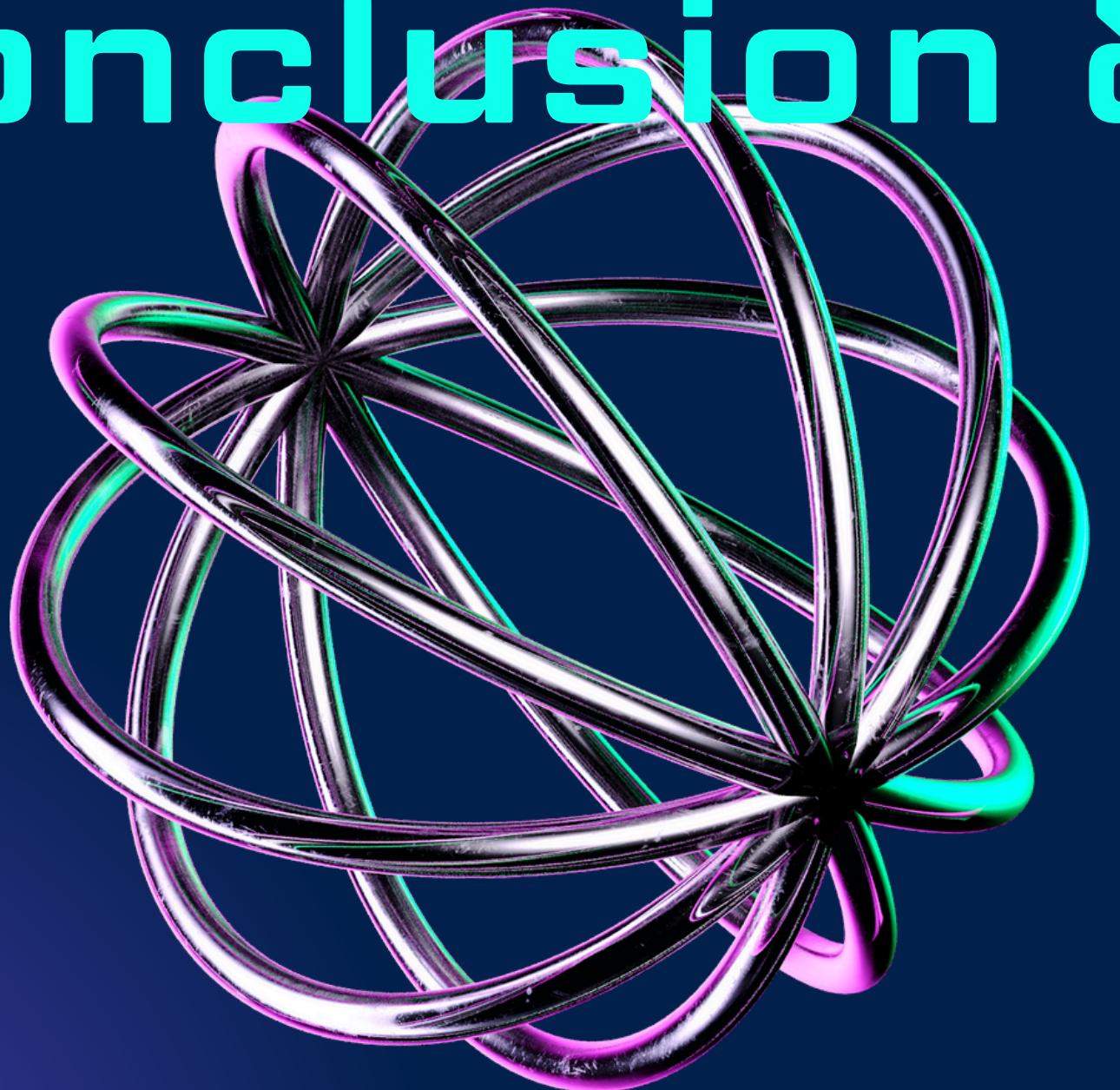
Security

Firewalls & intrusion detection often focus on layers 3-7 for analyzing traffic.



Conclusion & Key Takeaways

Why OSI Still Matters



- Standard way of understanding network flow, design, and troubleshooting.
- Helps separate complex networking tasks into manageable layers.
- Informs protocol development and ensures interoperability.
- Serves as a universal language for network engineers, administrators, and students.



Q&A

Questions or Discussion





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Review Quiz

Week 4 - OSI Model Presentation- Team 1

1. Which OSI layer is responsible for end-to-end transport of data and error checking to guarantee reliable delivery (such as via TCP)?

- A. Network (Layer 3)
- B. Transport (Layer 4)
- C. Data Link (Layer 2)
- D. Session (Layer 5)

- 2. At which OSI layer do routers primarily function to forward packets between different networks?**
- A. Physical (Layer 1)
 - B. Transport (Layer 4)
 - C. Network (Layer 3)
 - D. Presentation (Layer 6)

3. Which of the following best describes the role of the Session layer (Layer 5)?

- A. Converting data into standard formats like JPEG or MP3
- B. Establishing, maintaining, and terminating communication sessions**
- C. Determining the best path for data to travel
- D. Handling MAC addresses and frames for node-to-node delivery

4.What is the primary purpose of the Physical layer (Layer 1)?

- A. Routing data packets from source to destination
- B. Managing and securing logical connections between applications
- C. Defining media, signal, and binary transmission
- D. Encrypting and compressing data streams

5. Which OSI layer handles data encryption and decryption as well as data formatting?

- A. Application (Layer 7)
- B. Transport (Layer 4)
- C. Presentation (Layer 6)
- D. Session (Layer 5)

6.Which of the following OSI layers would be most concerned with port numbers such as 80 (HTTP) or 443 (HTTPS)?

- A. Application (Layer 7)
- B. Network (Layer 3)
- C. Transport (Layer 4)
- D. Data Link (Layer 2)

**7. Which of these statements about the Application layer
(Layer 7) is correct?**

- A. It provides the graphical user interface for the operating system.
- B. It manages frames and MAC addresses for local delivery.
- C. It includes protocols like HTTP and SMTP for end-user services.
- D. It packages raw bits for transmission over copper or fiber lines.

8. In the context of the OSI model, which layer is directly above the Network layer (Layer 3)?

- A. Physical (Layer 1)
- B. Transport (Layer 4)
- C. Data Link (Layer 2)
- D. Session (Layer 5)

9. If you're troubleshooting a faulty cable that isn't carrying any signal, which OSI layer issue are you most likely dealing with?

- A. Network (Layer 3)
- B. Physical (Layer 1)
- C. Data Link (Layer 2)
- D. Presentation (Layer 6)

10. Which two layers of the OSI model handle reliable or unreliable data delivery and reassembly of segments or packets?

- A. Data Link (Layer 2) and Physical (Layer 1)
- B. Session (Layer 5) and Presentation (Layer 6)
- C. Network (Layer 3) and Transport (Layer 4)
- D. Transport (Layer 4) and Session (Layer 5)



Thank You
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