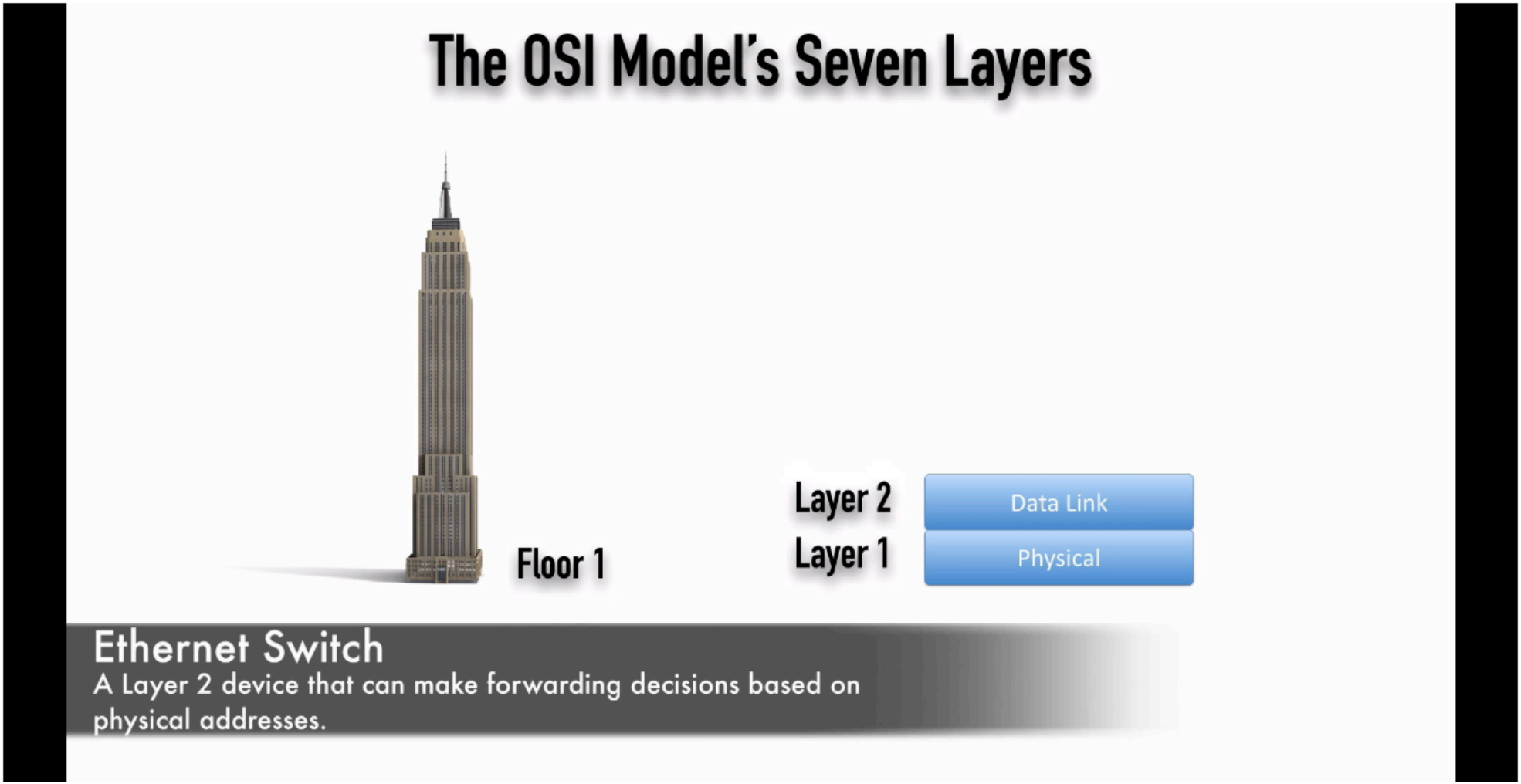
Completed

The OSI Model

Completed

The OSI Model



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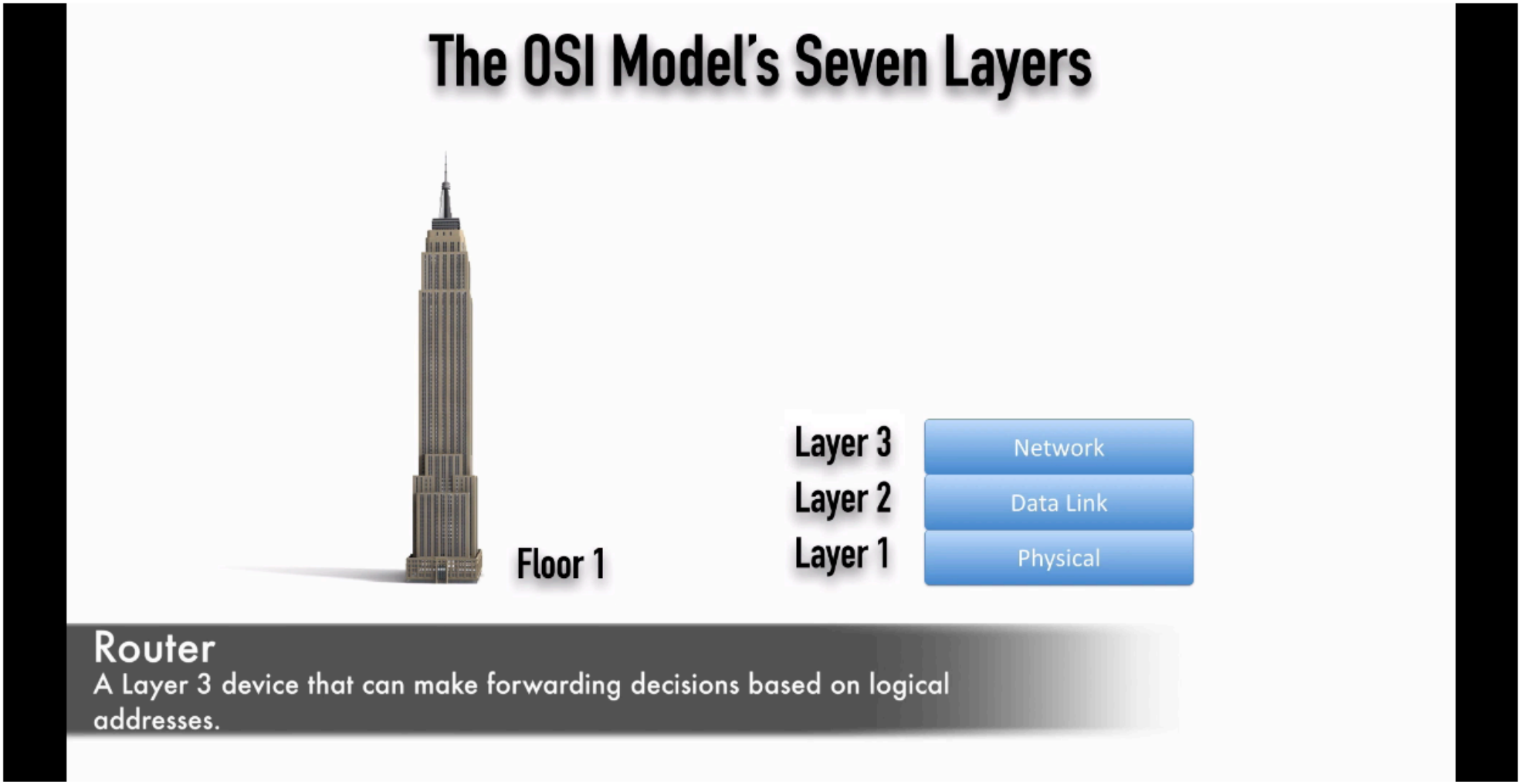

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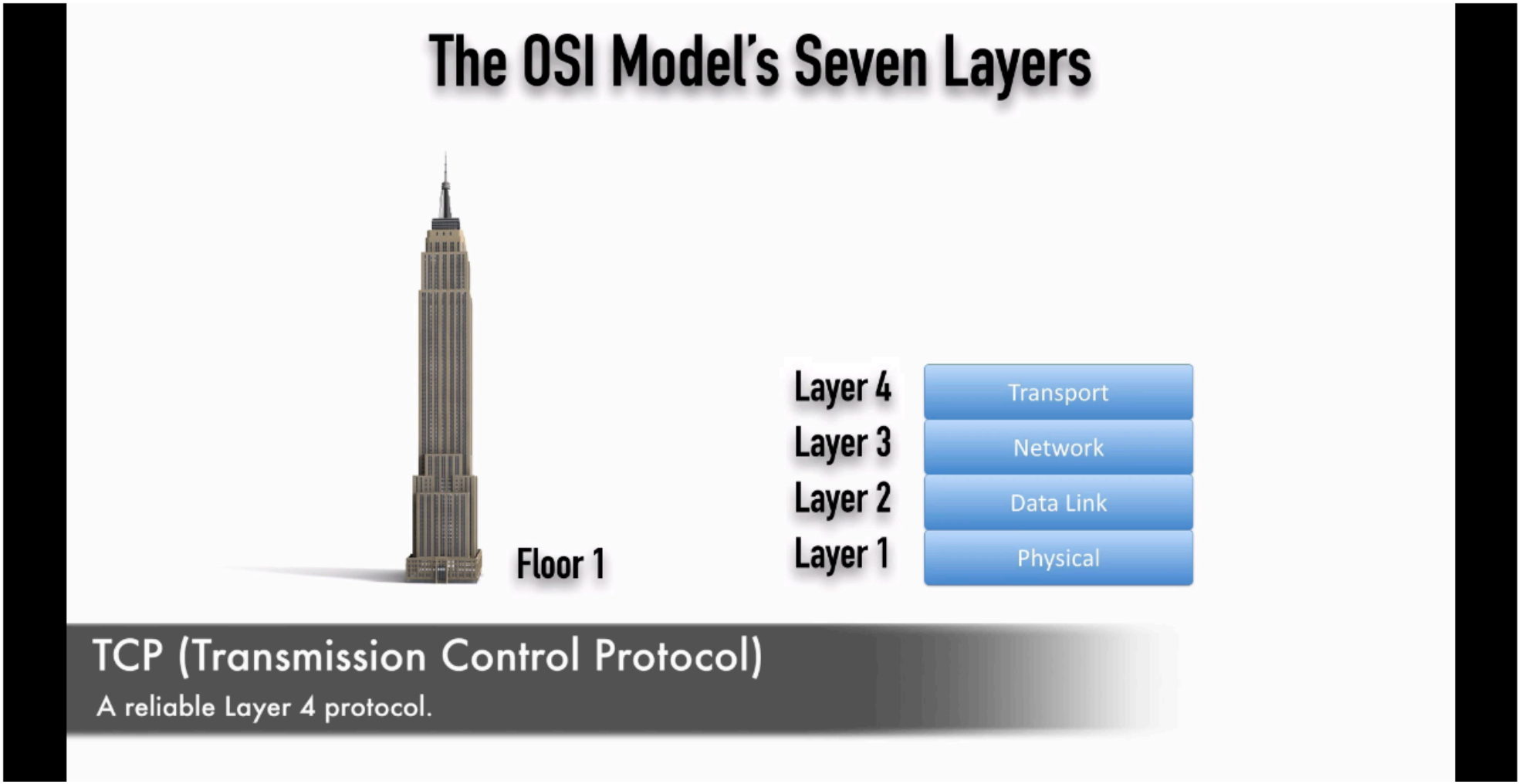

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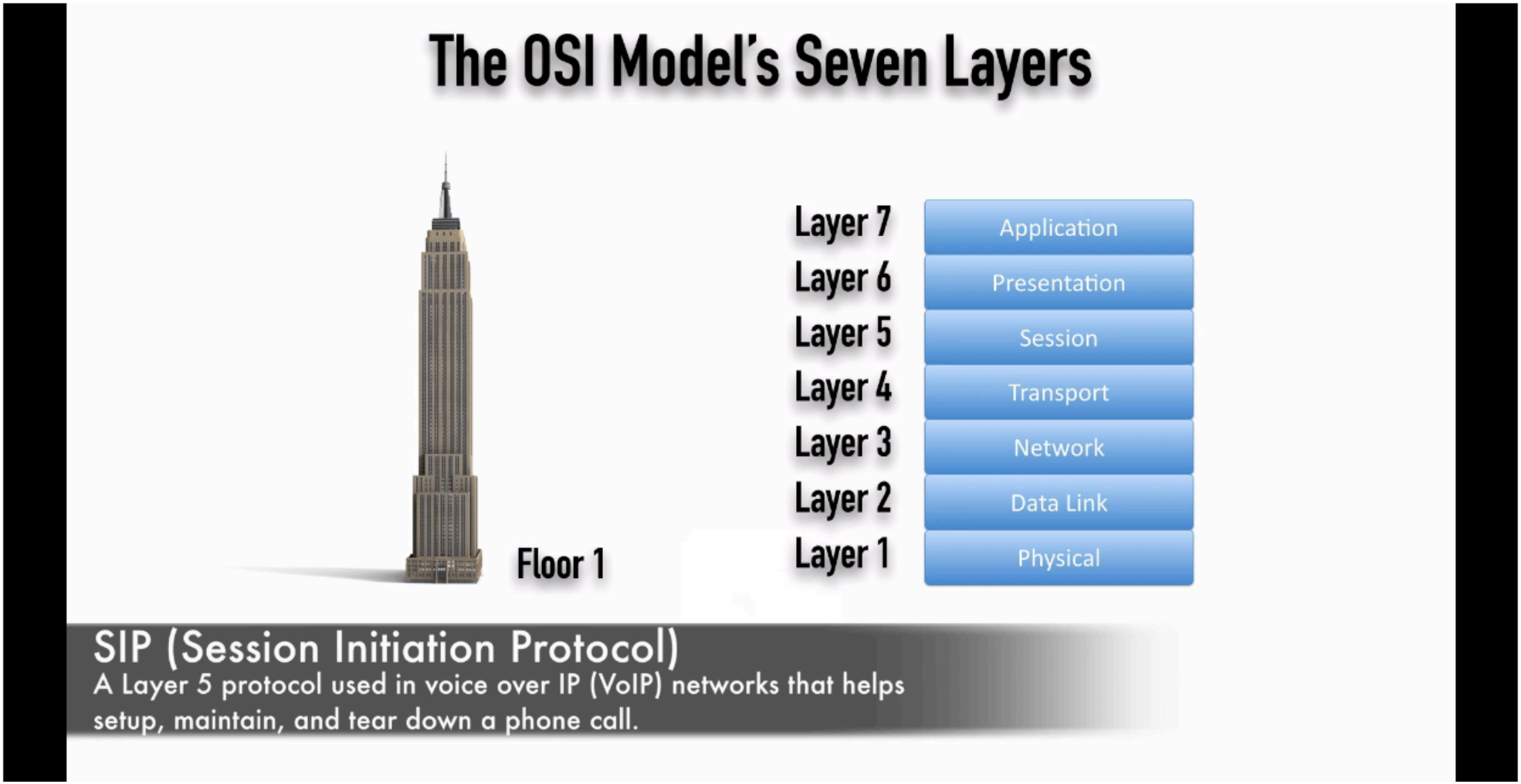

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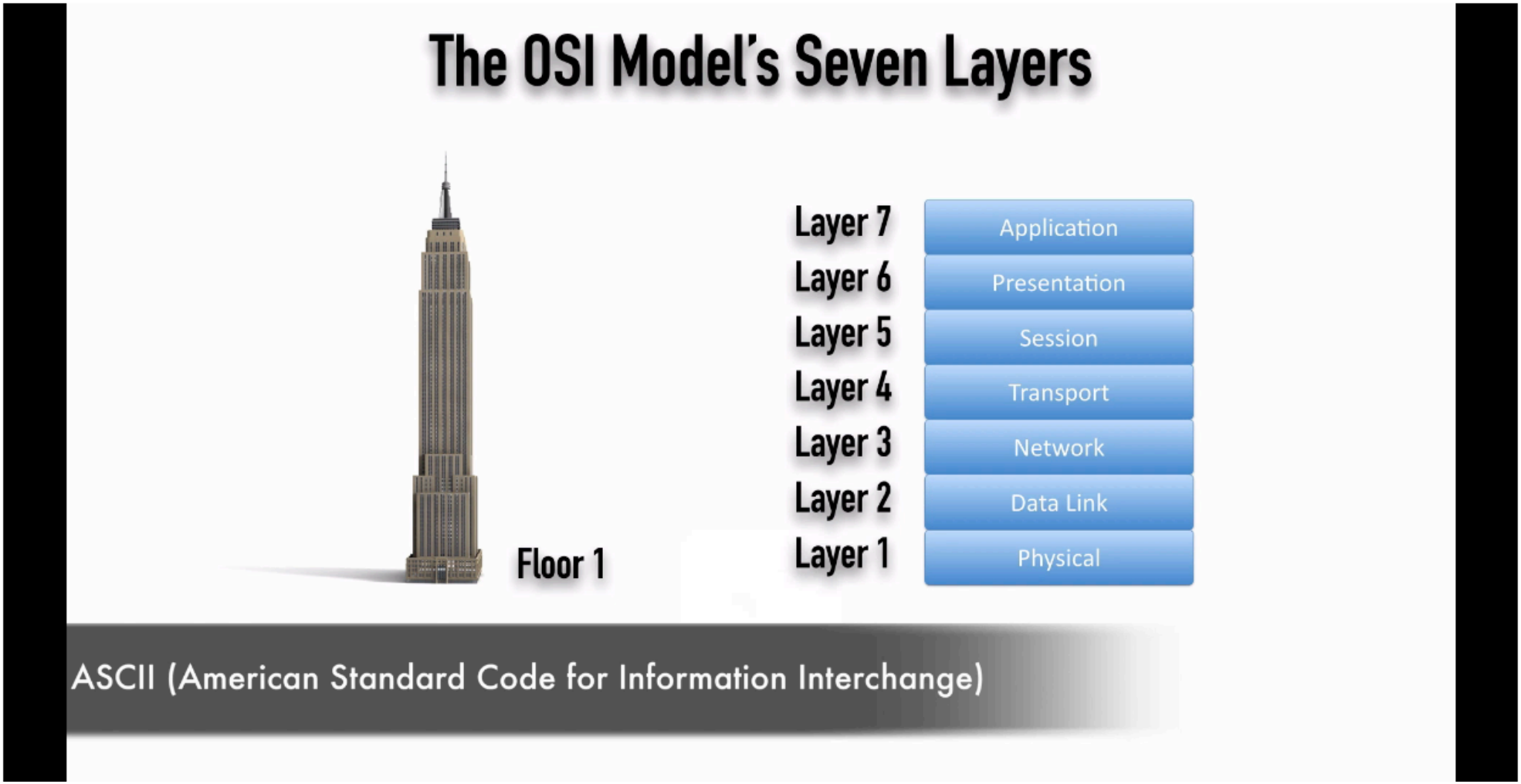

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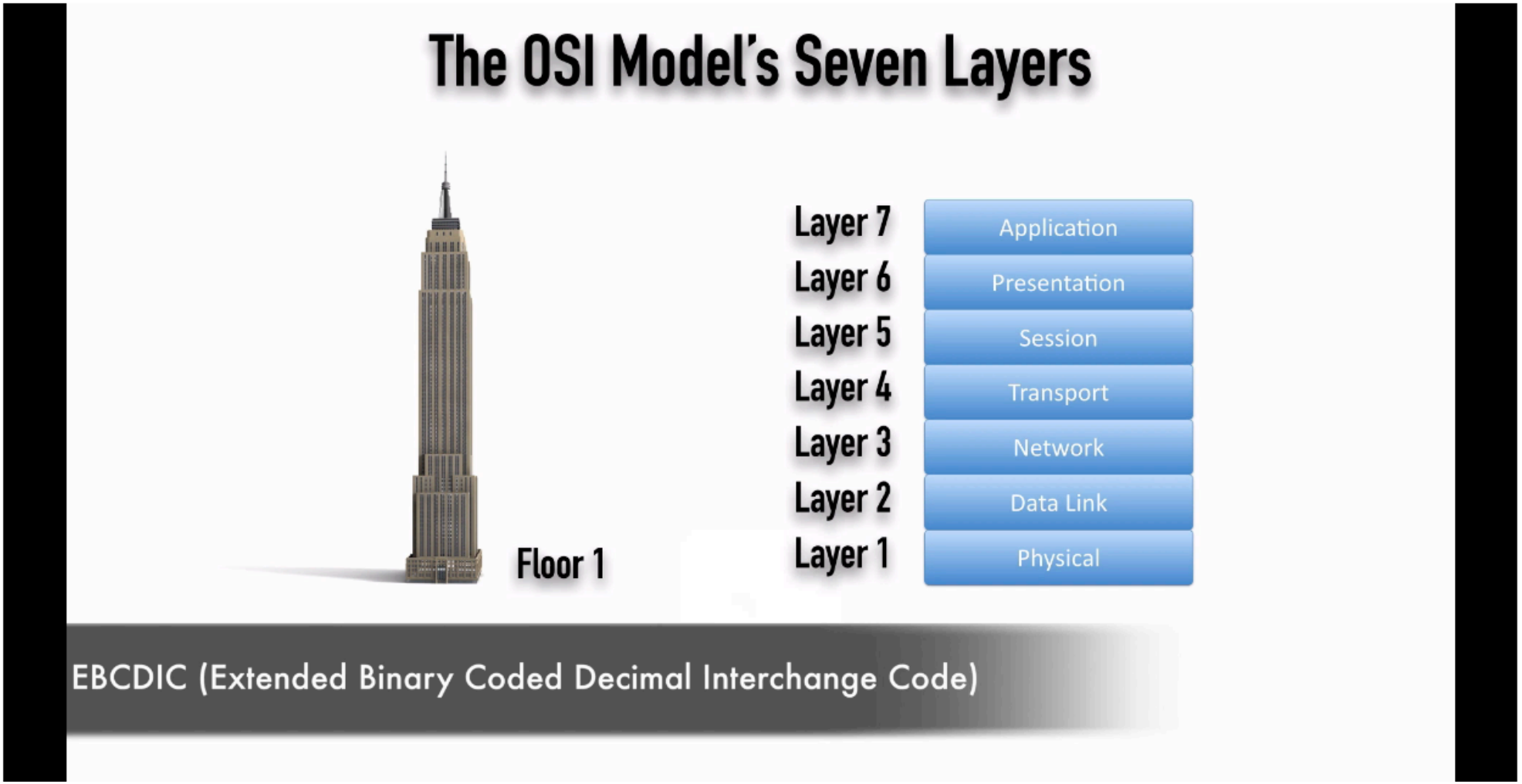

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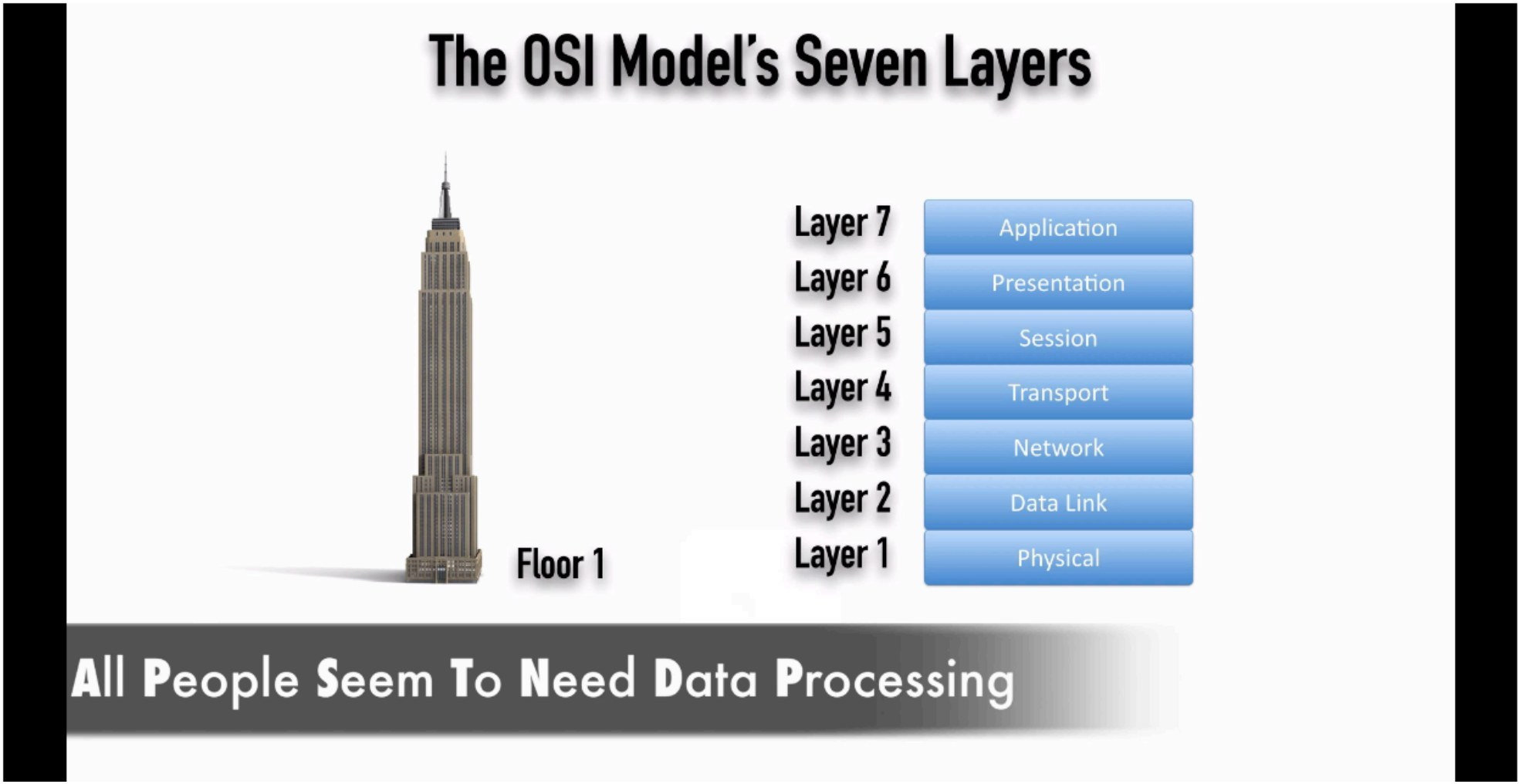

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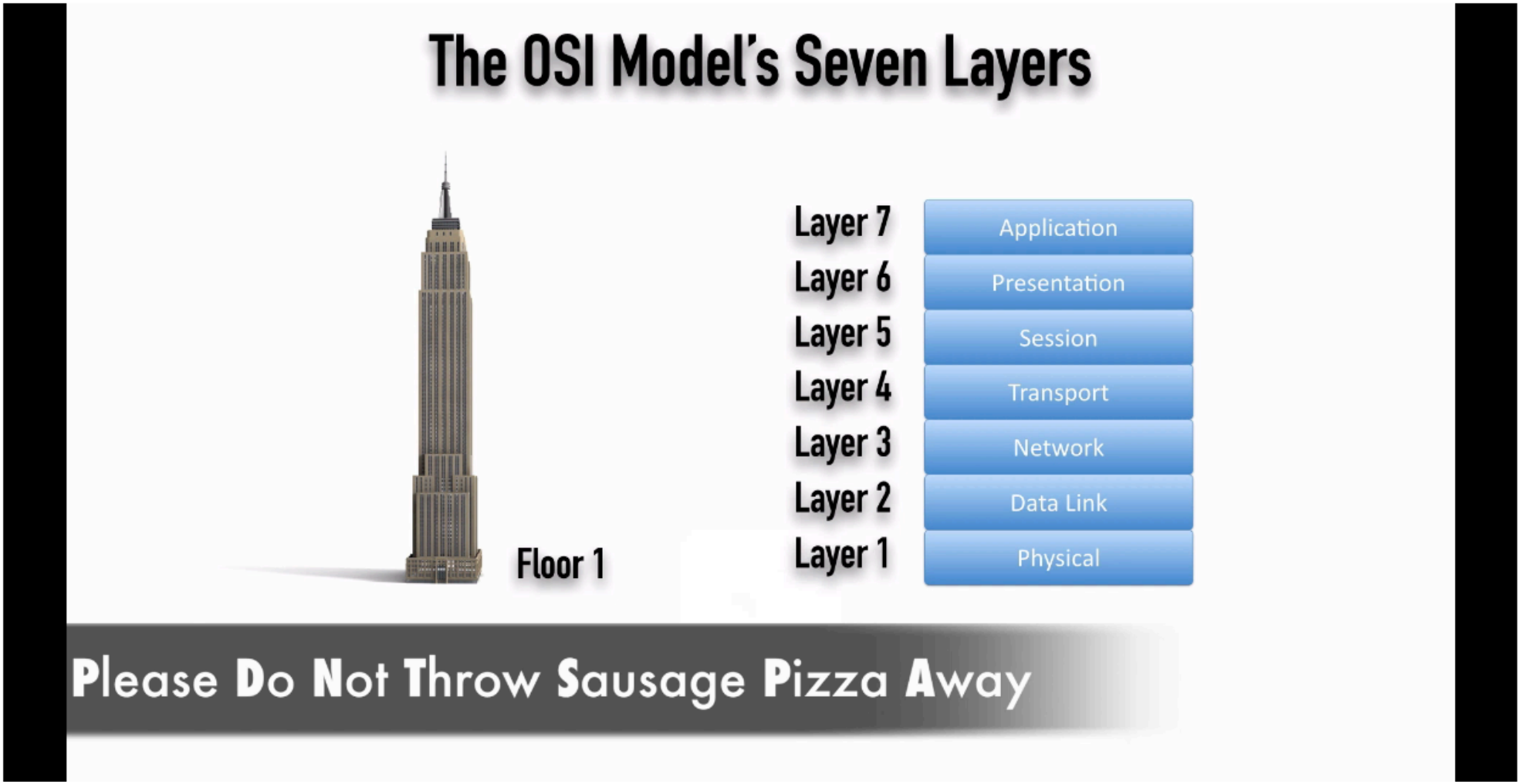

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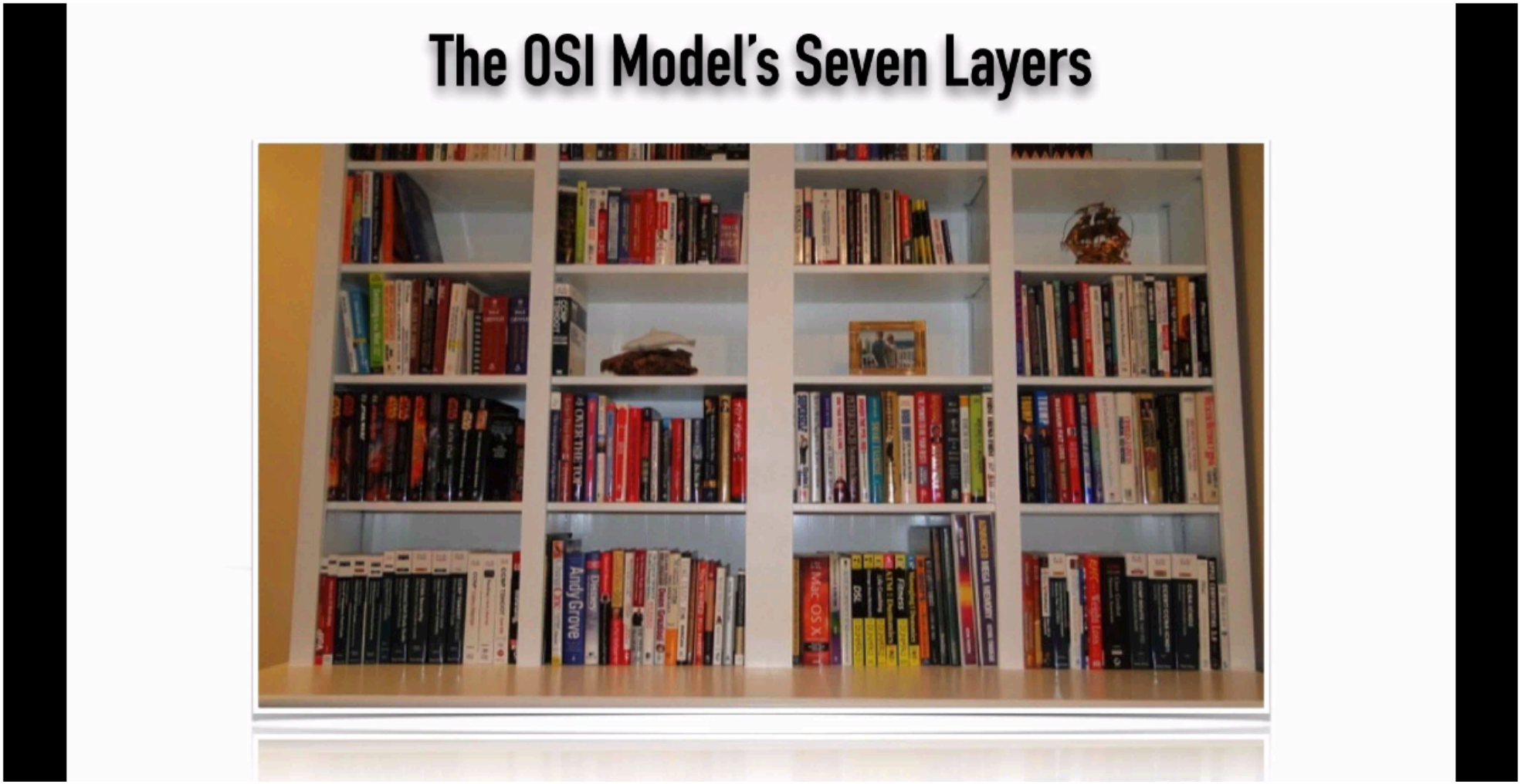

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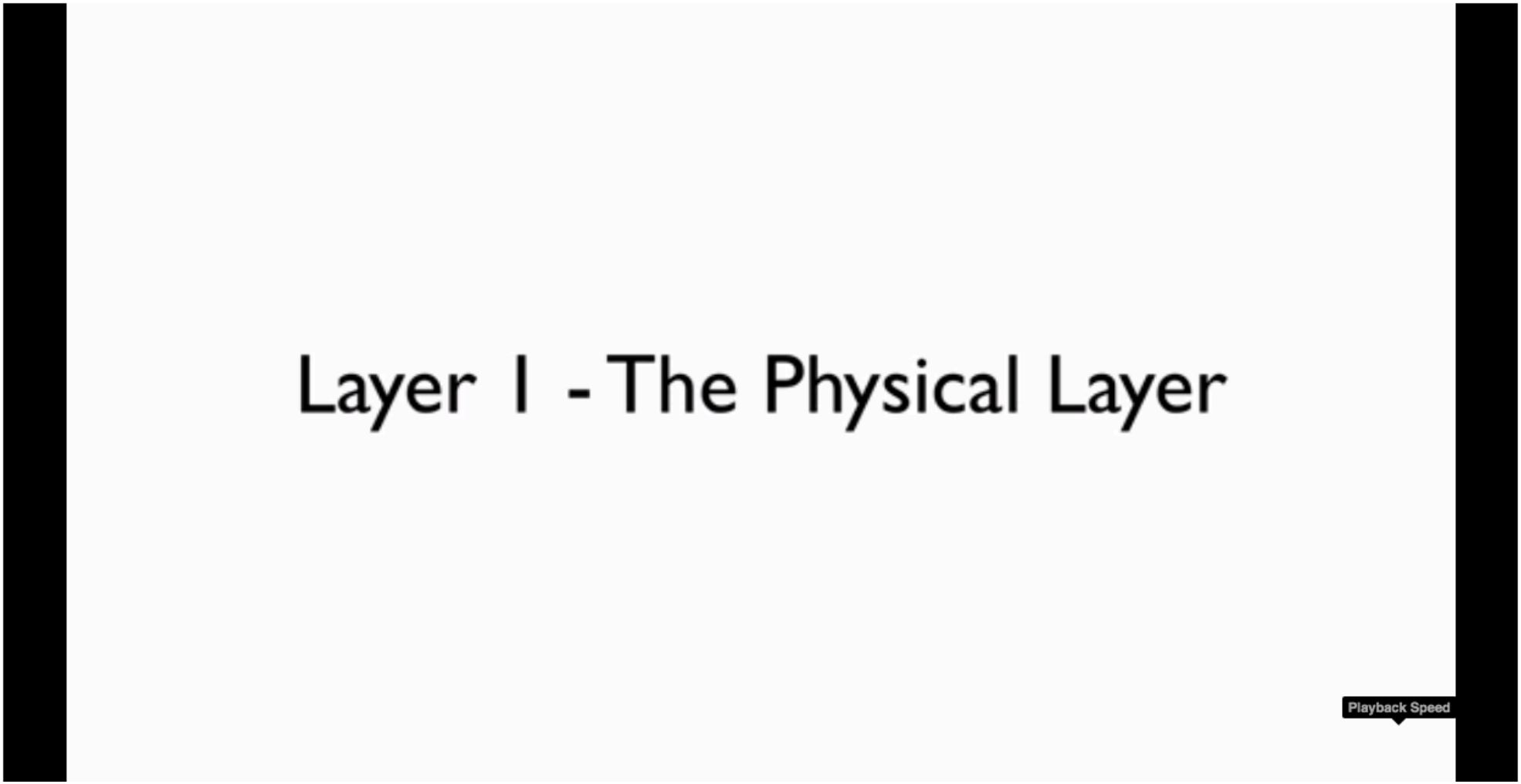

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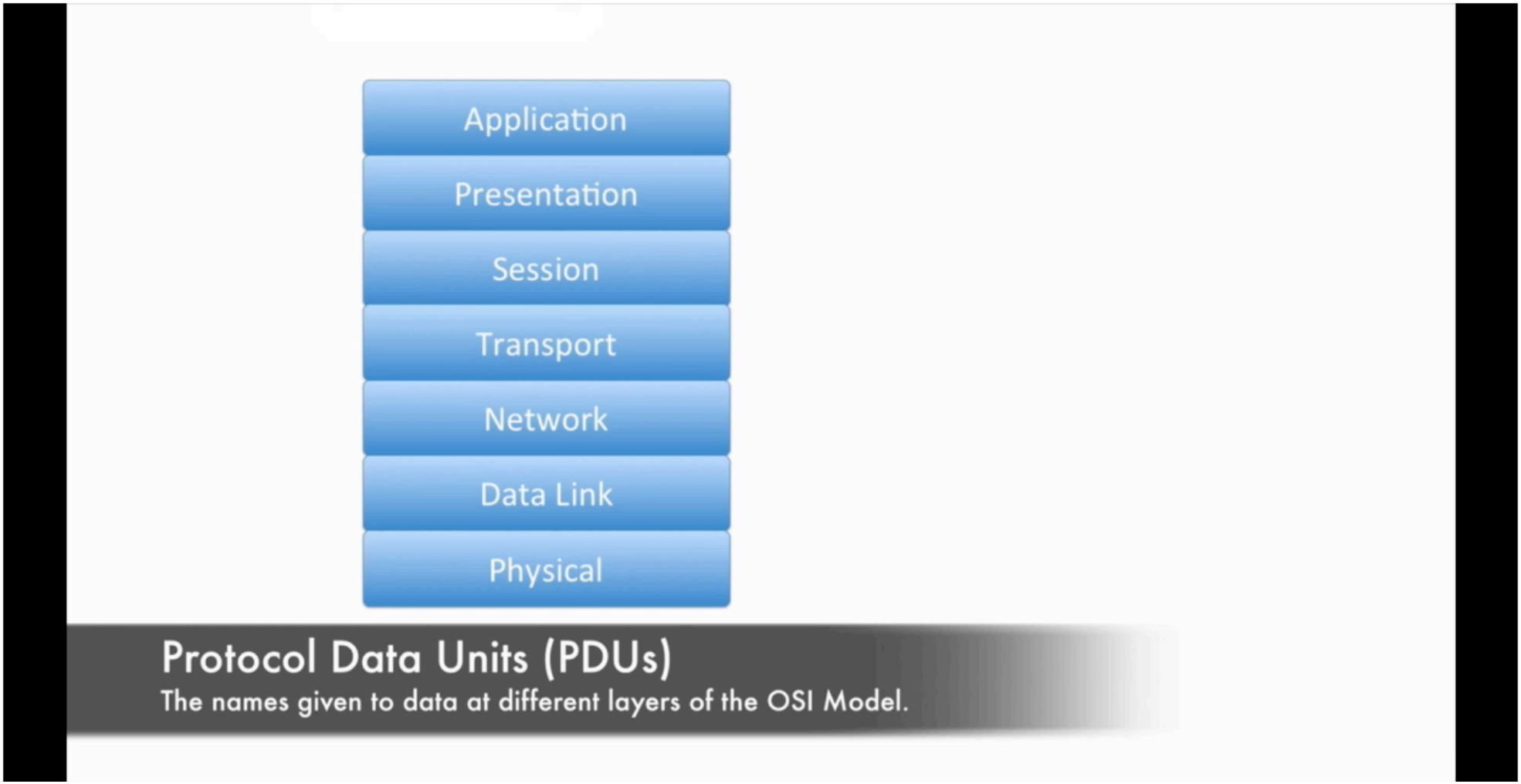

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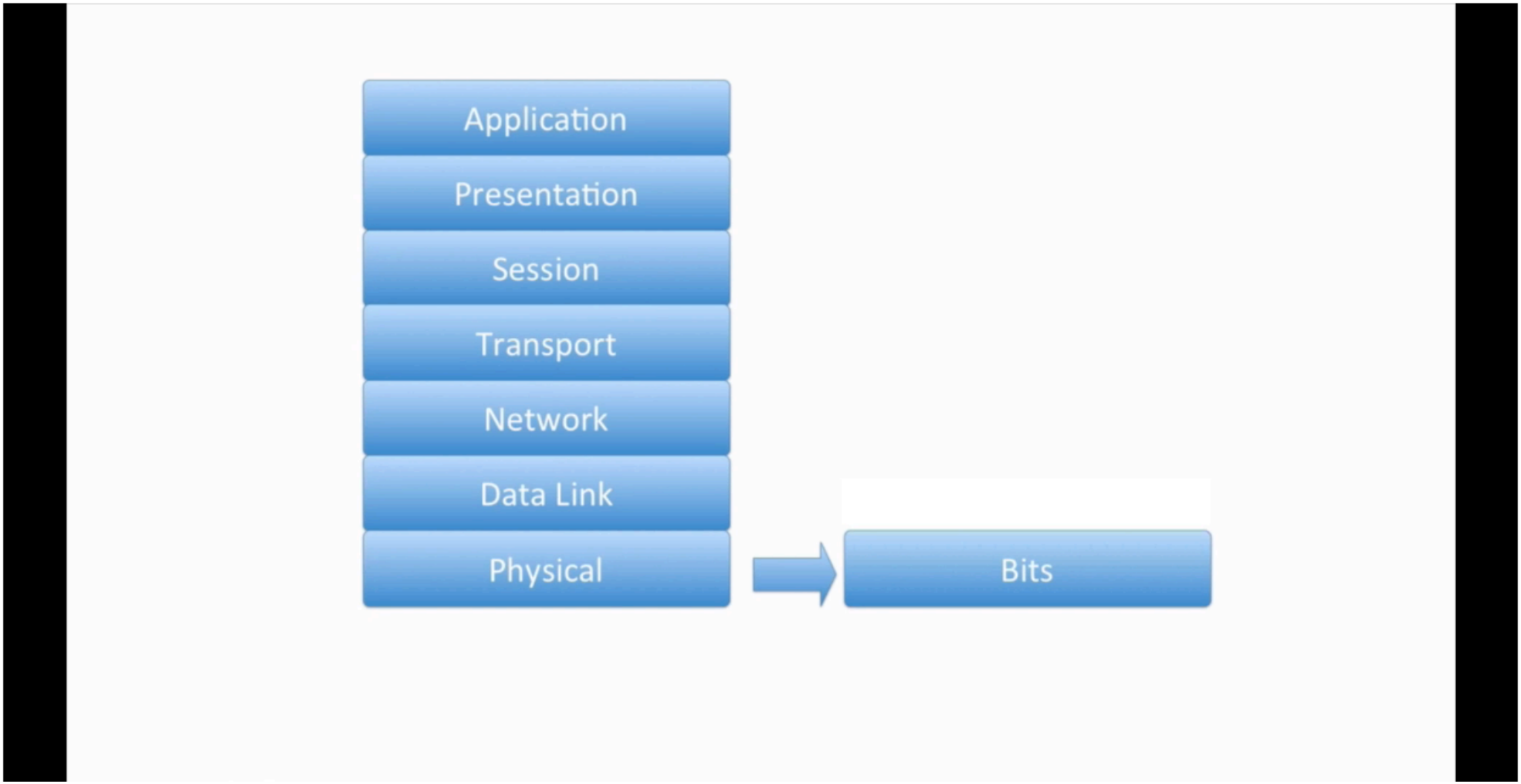

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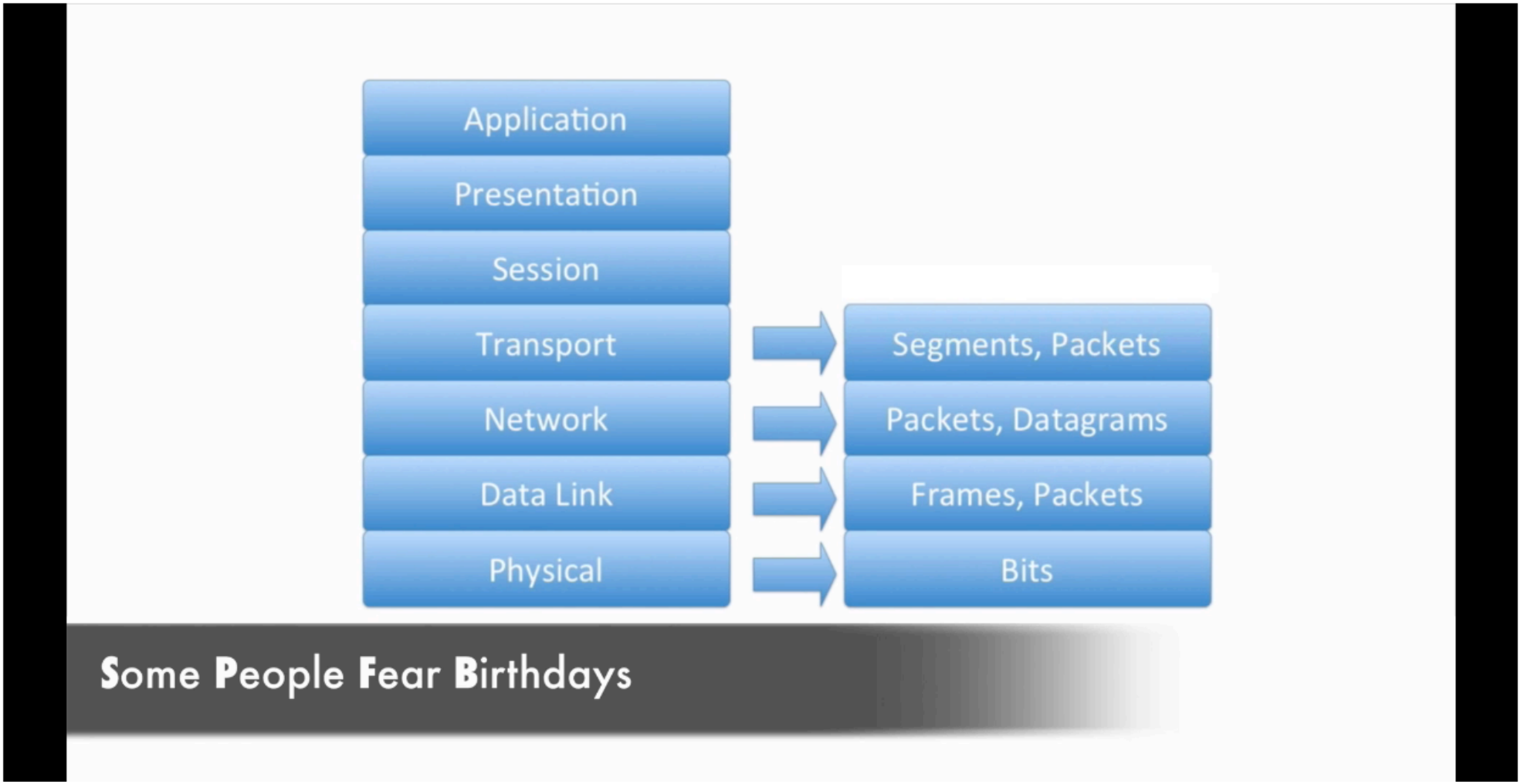

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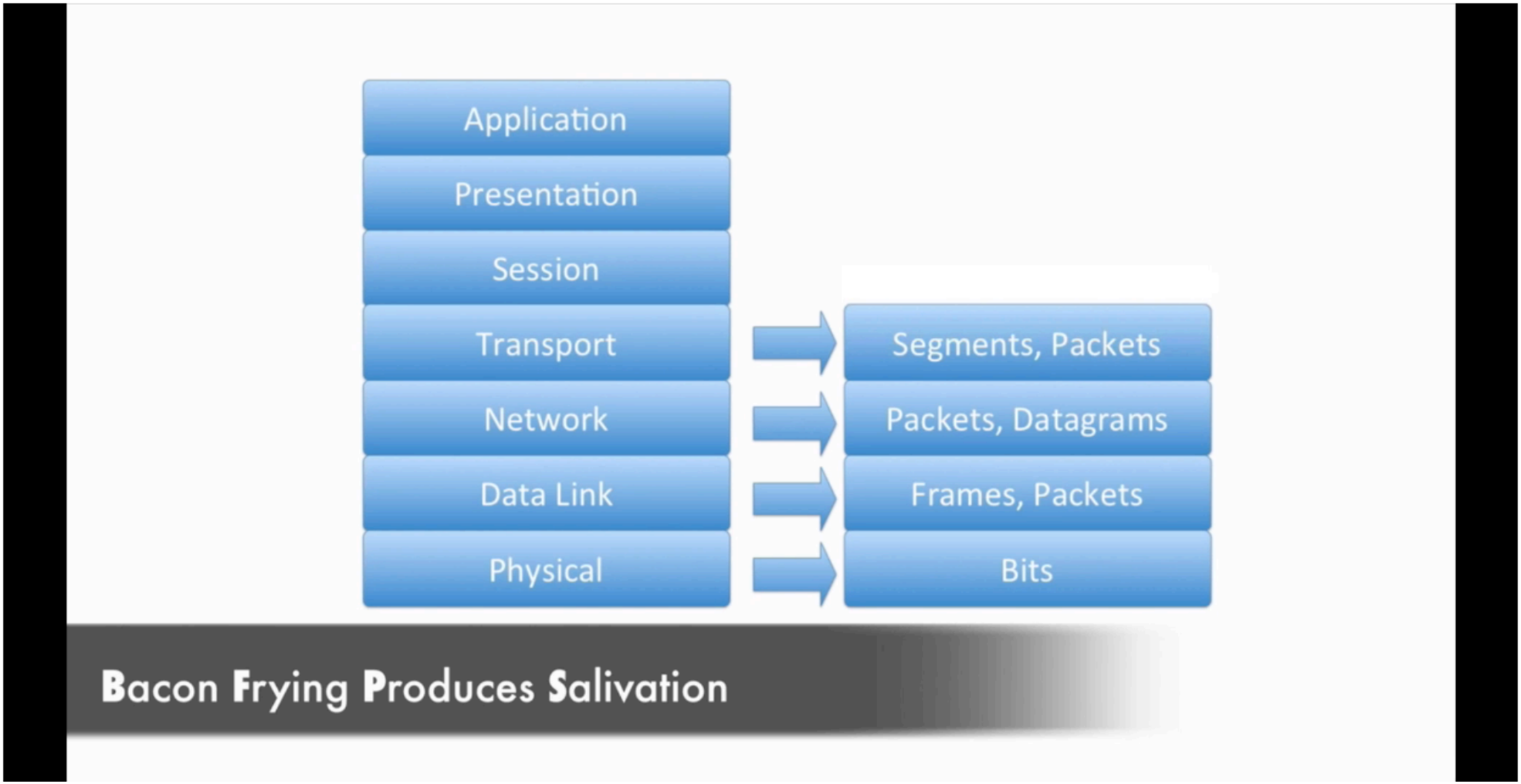

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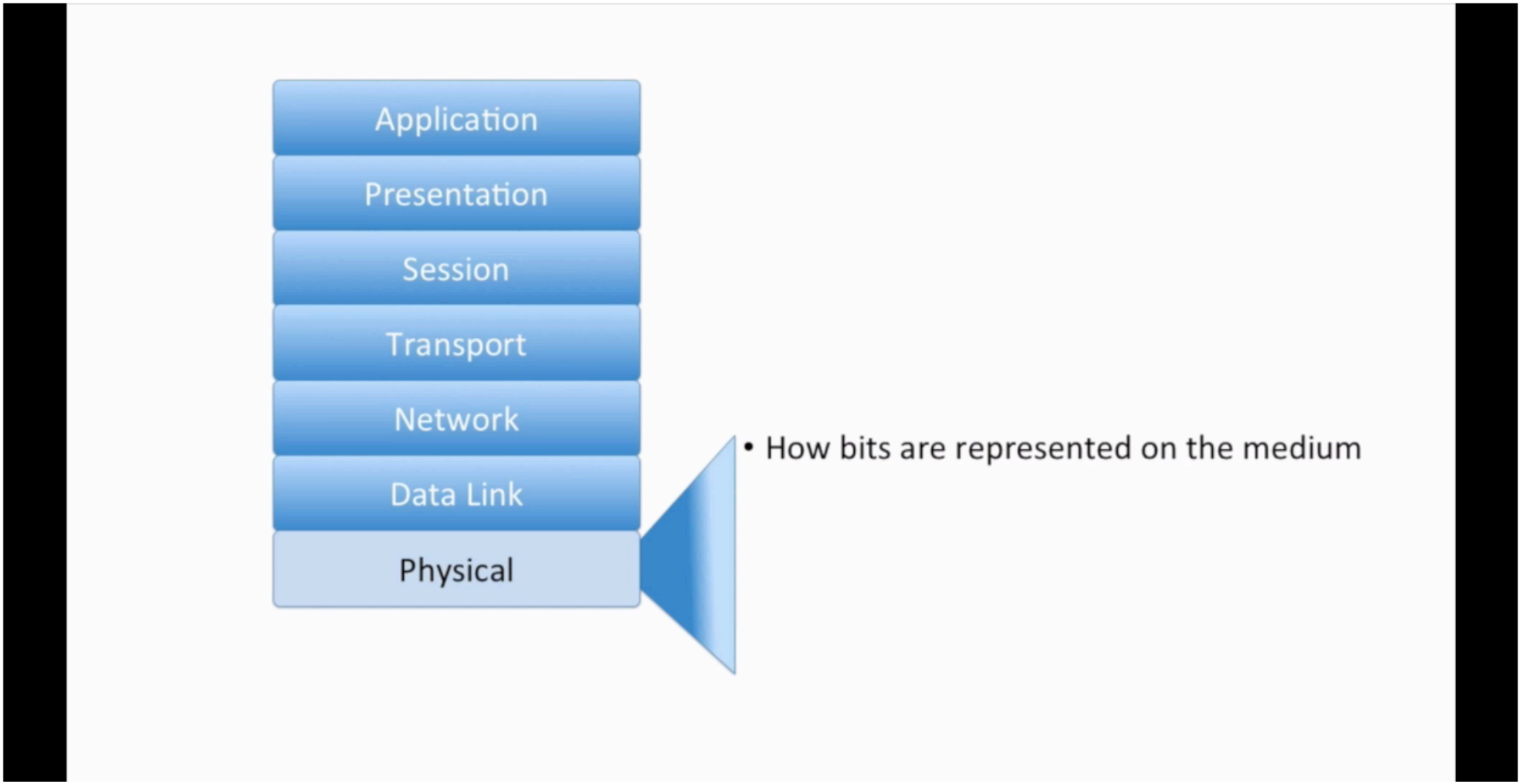

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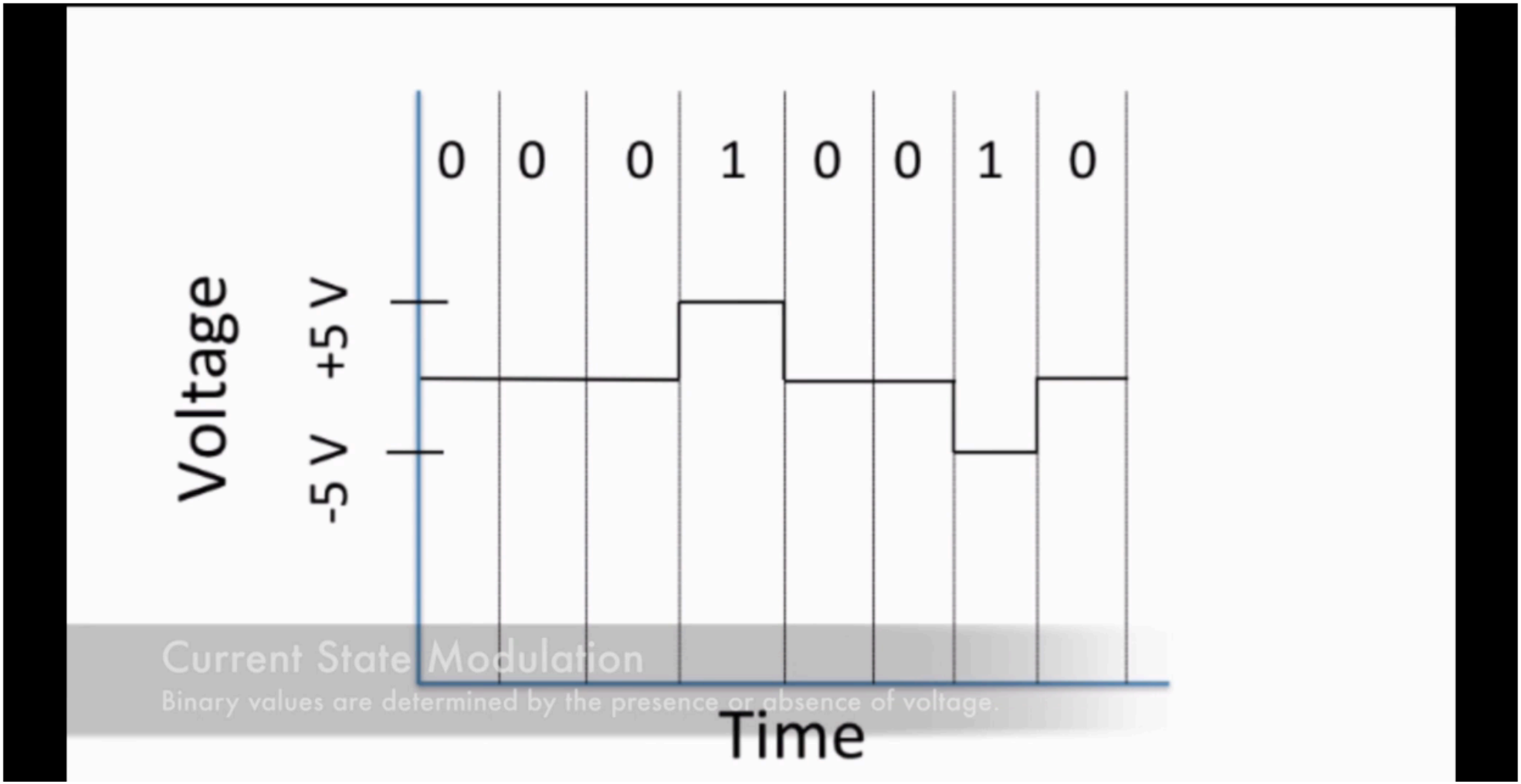

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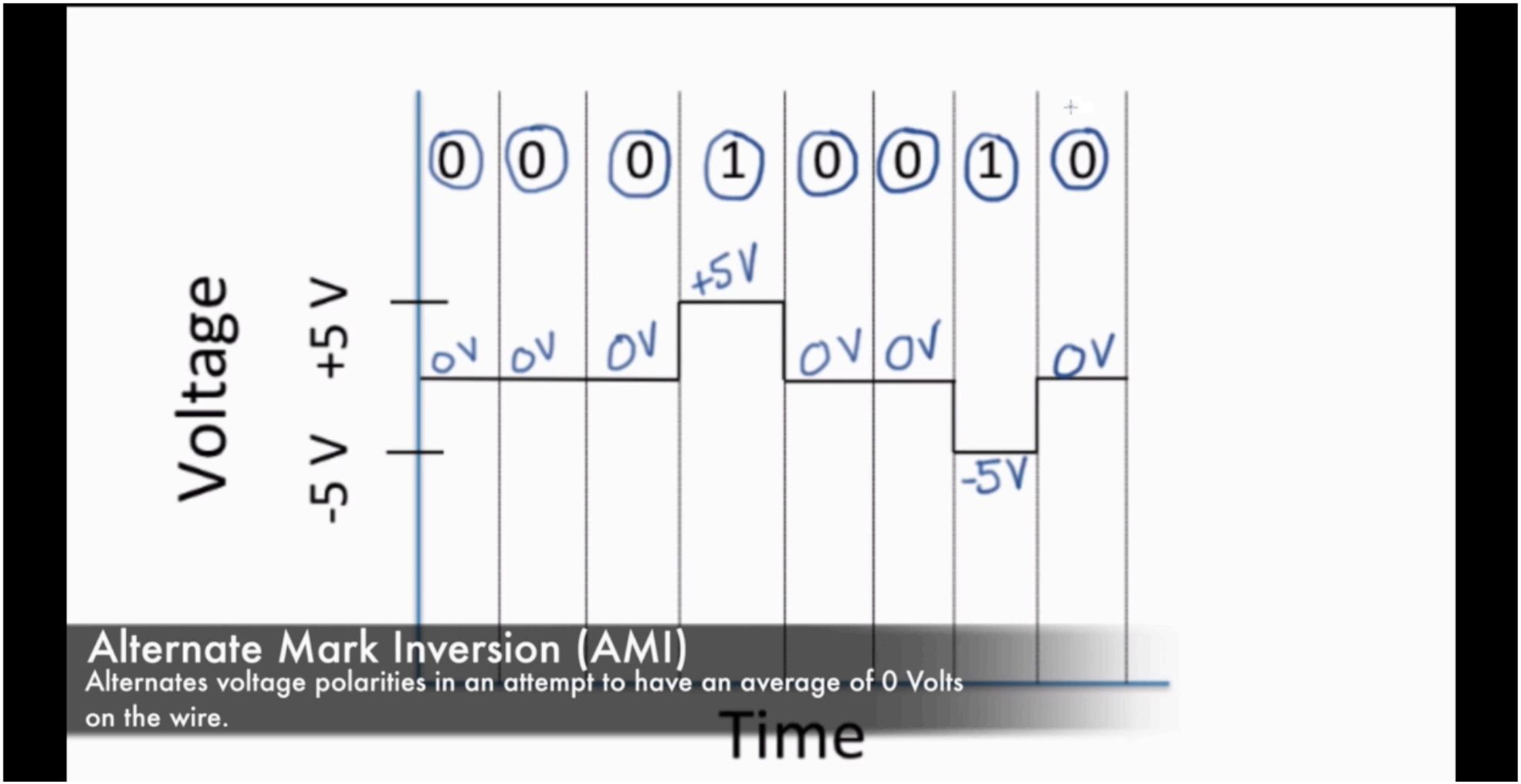

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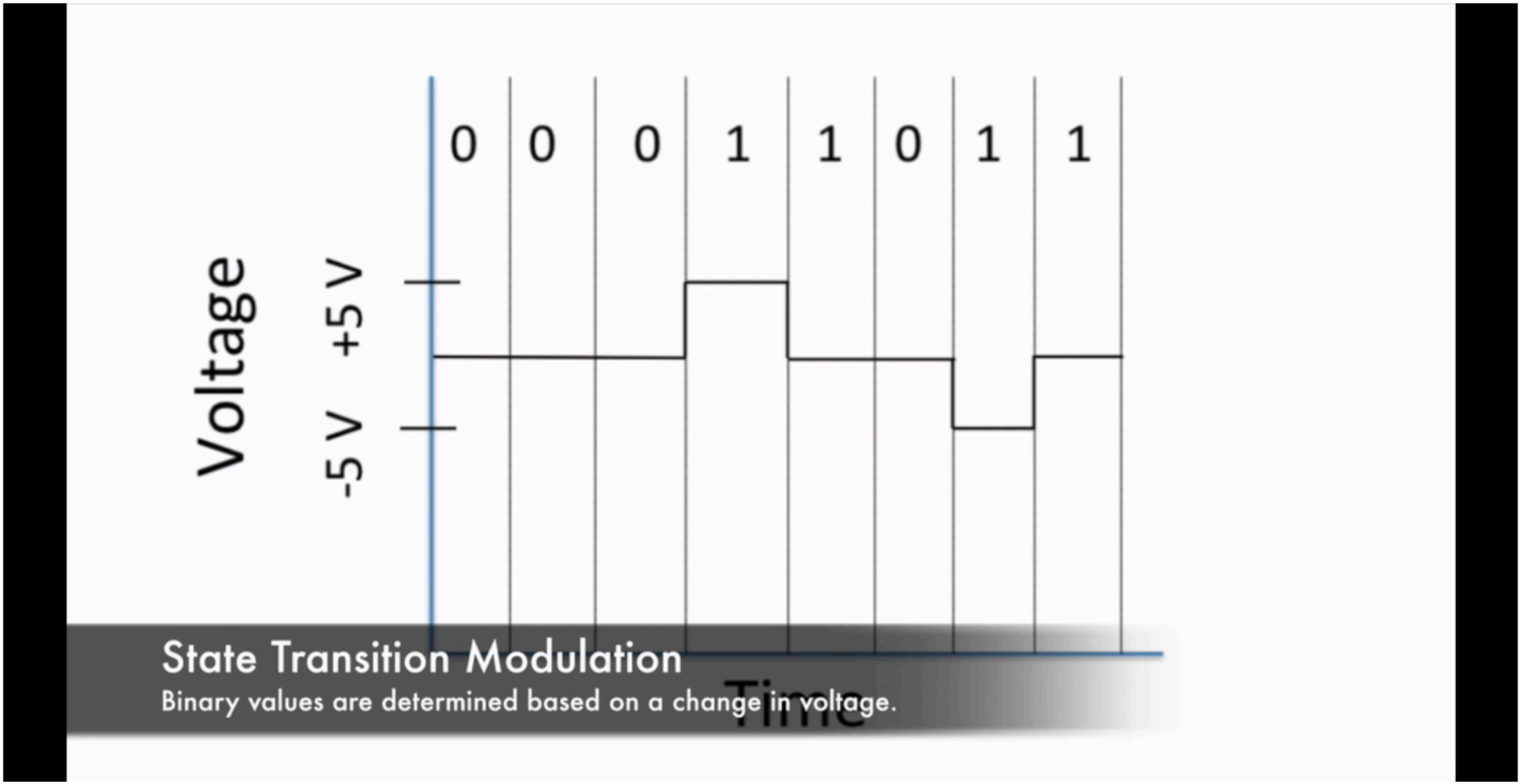

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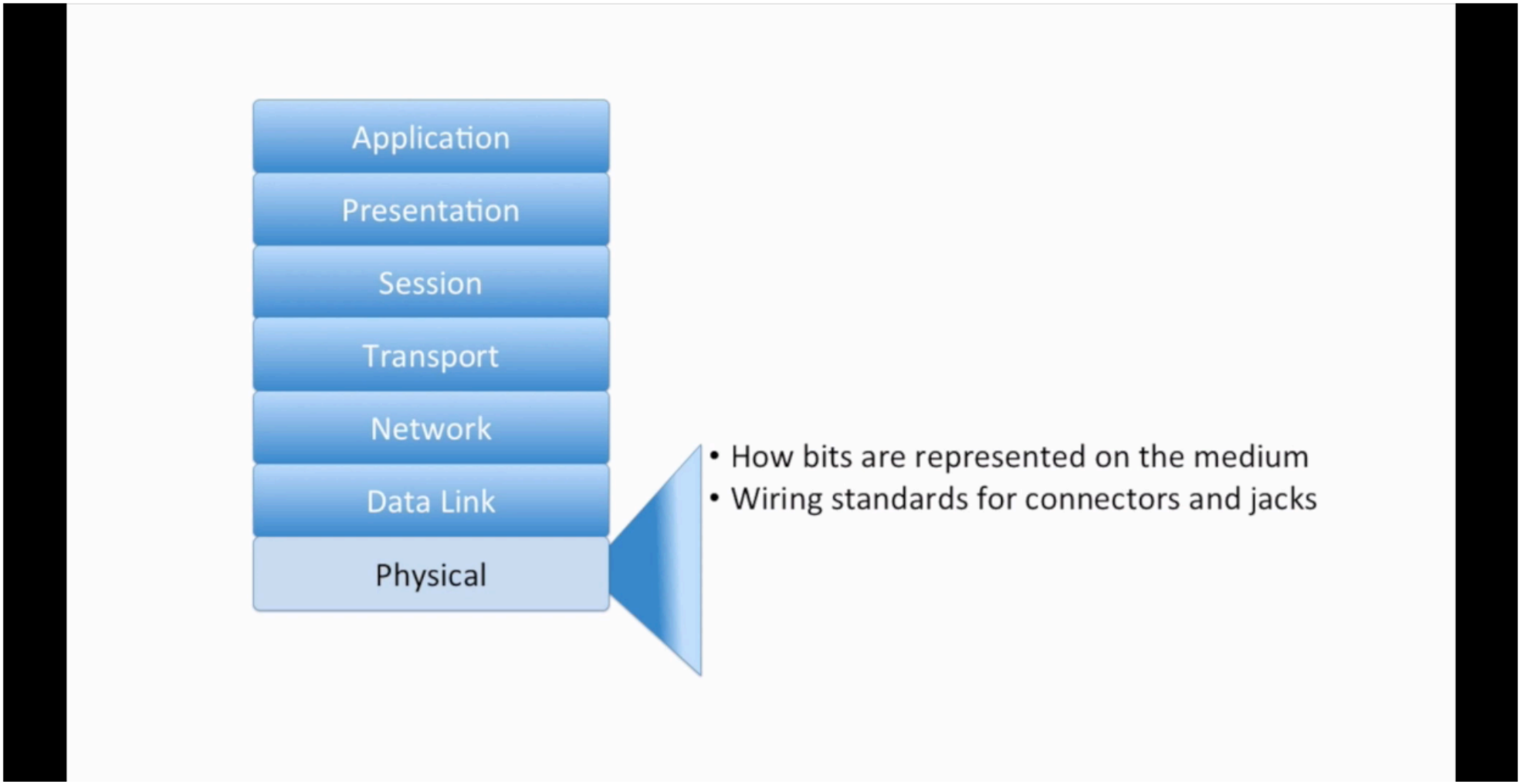

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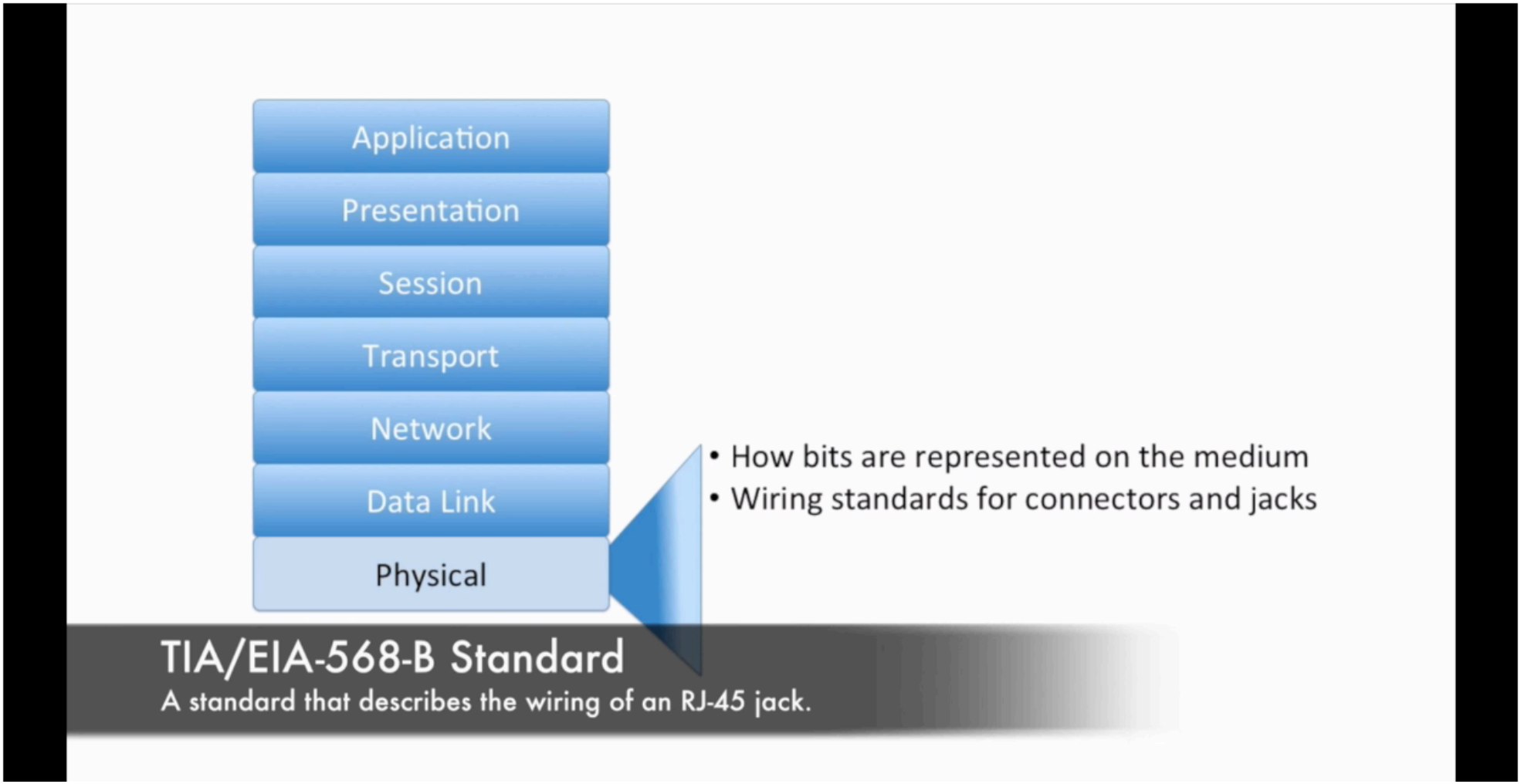

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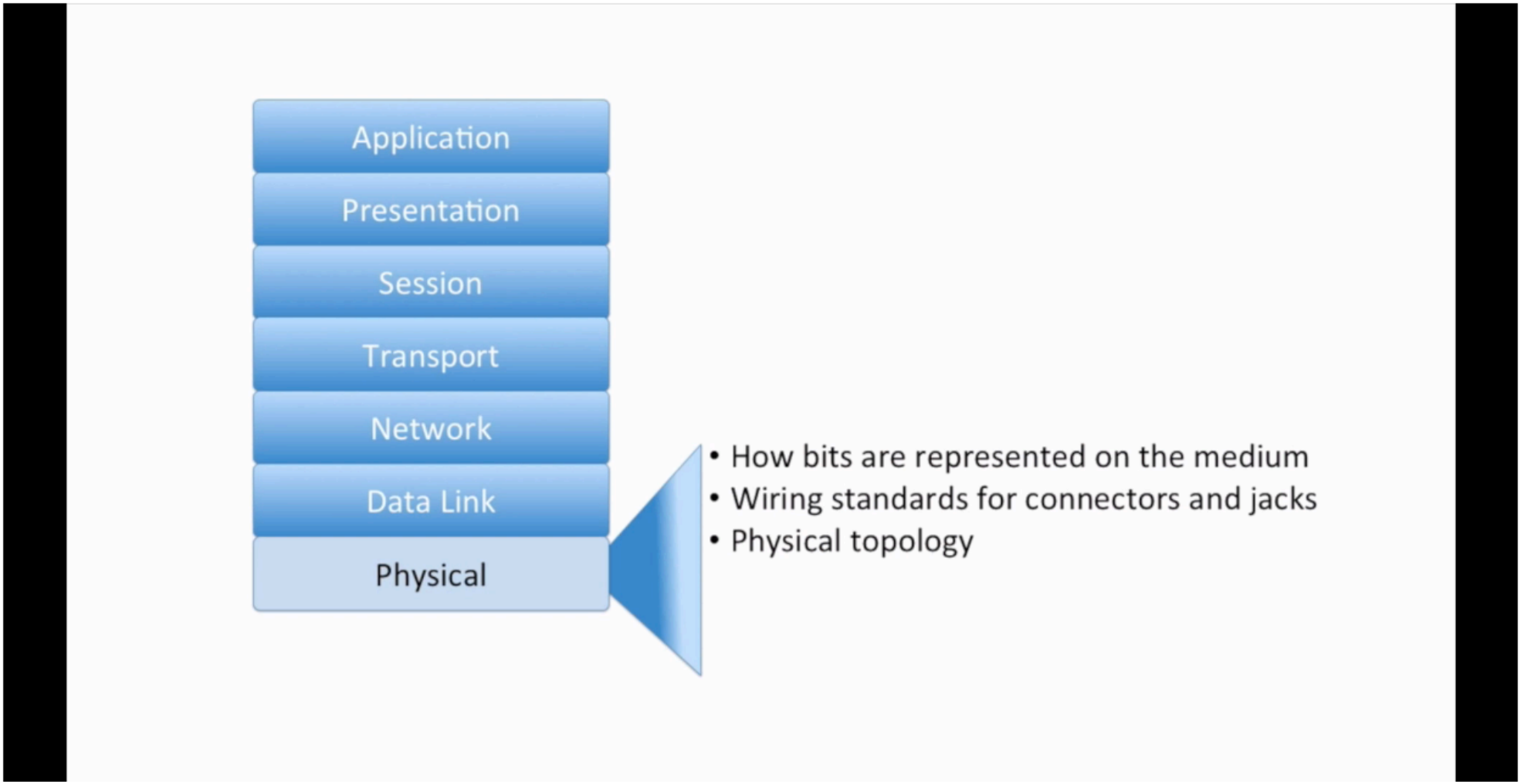

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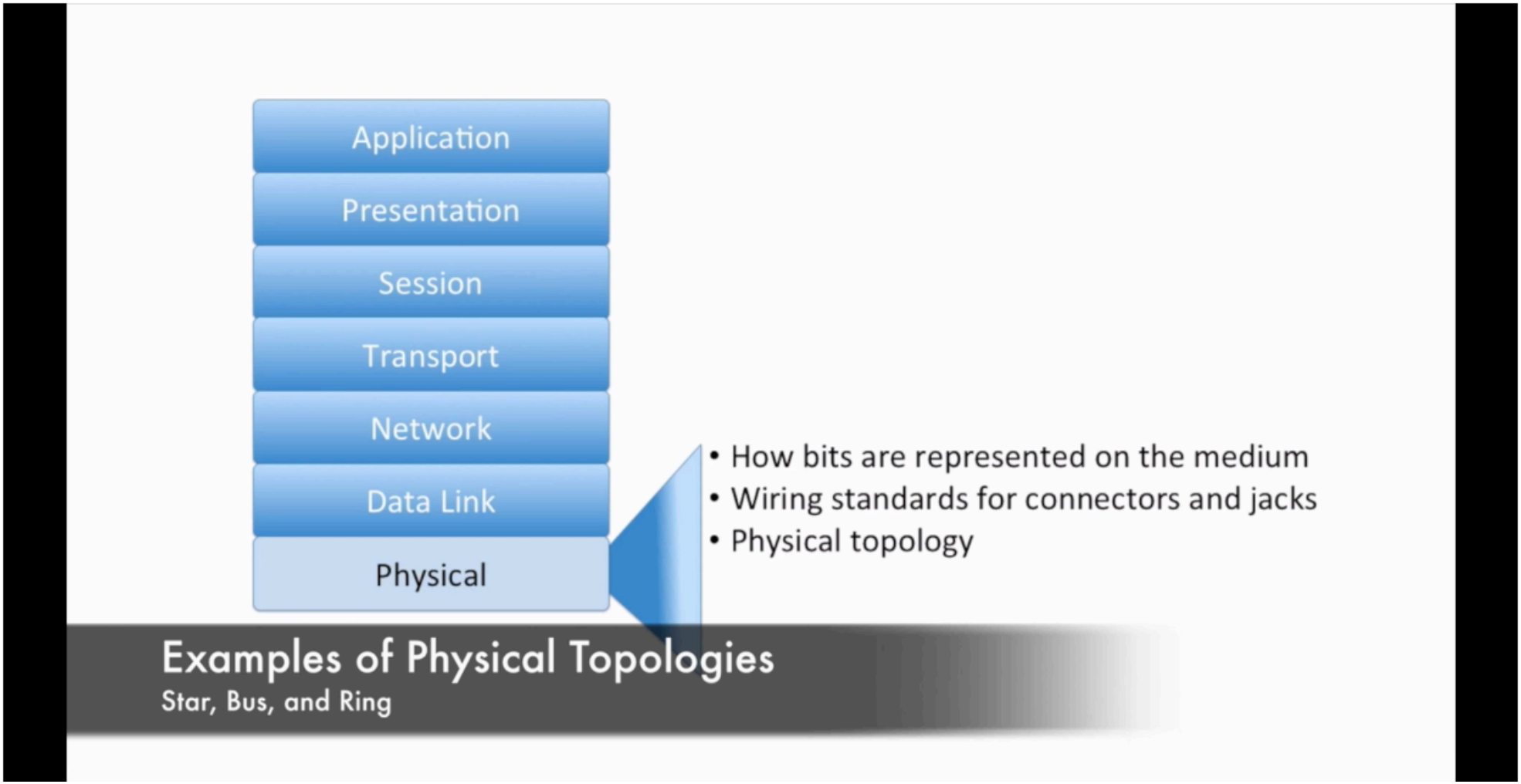

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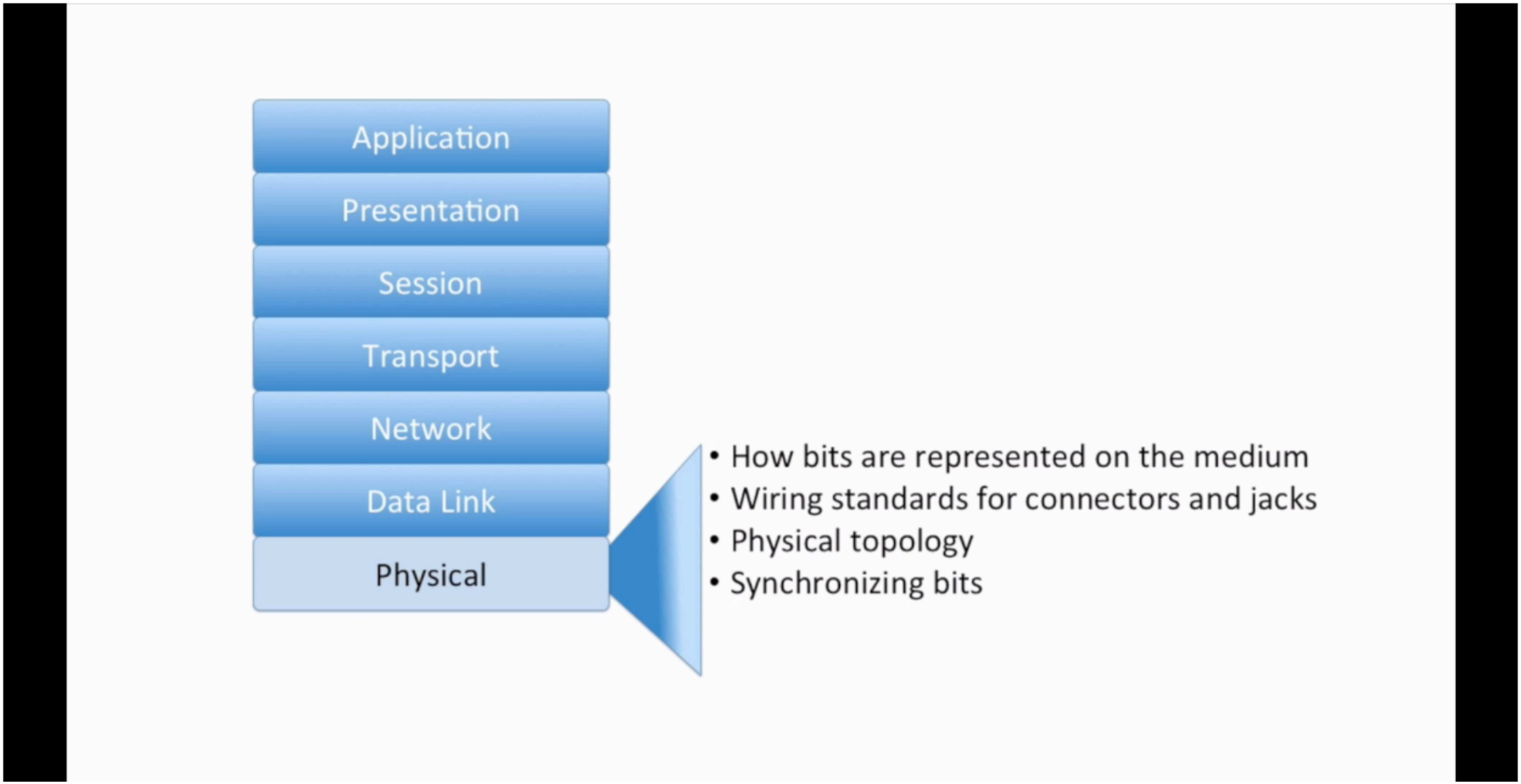

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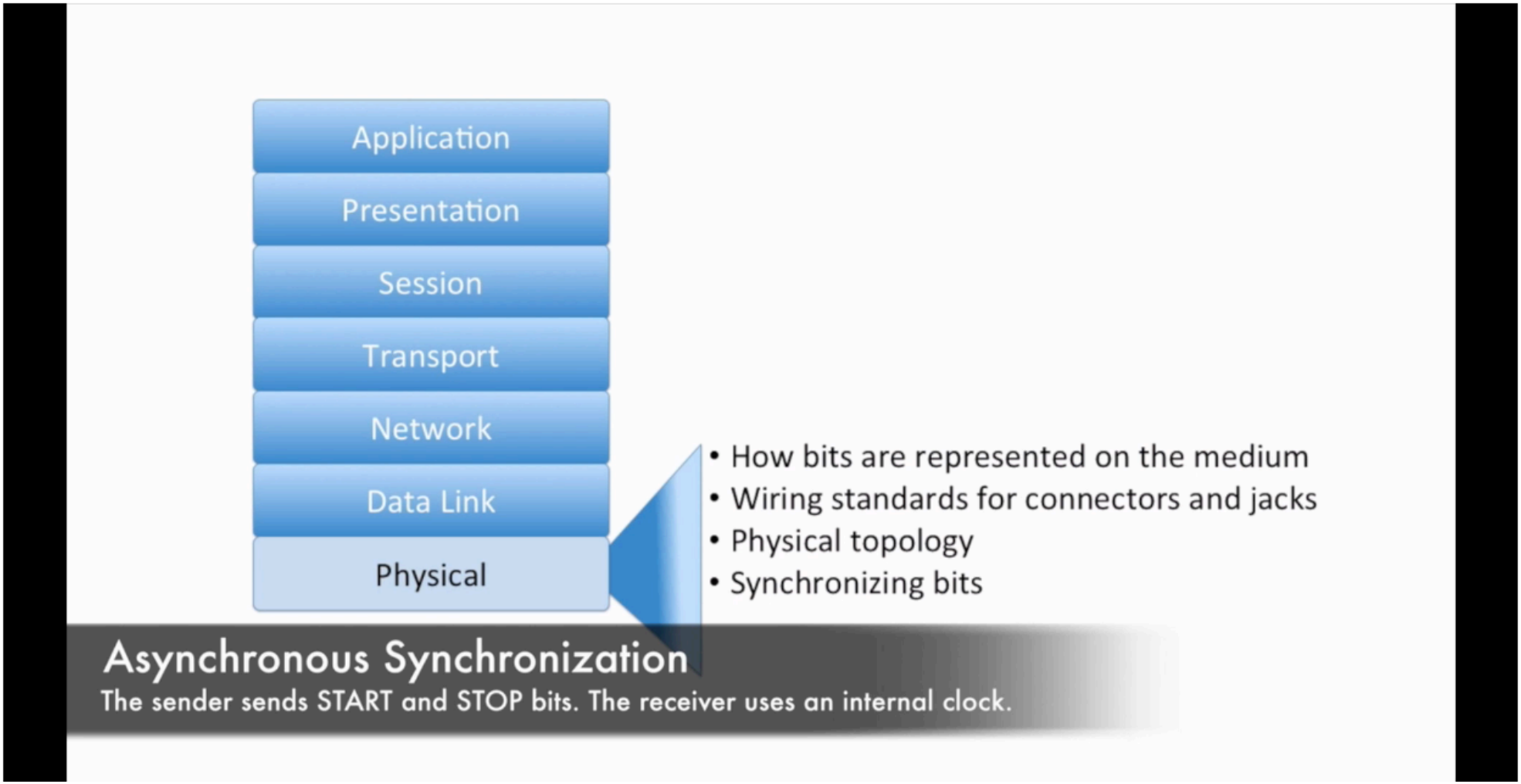

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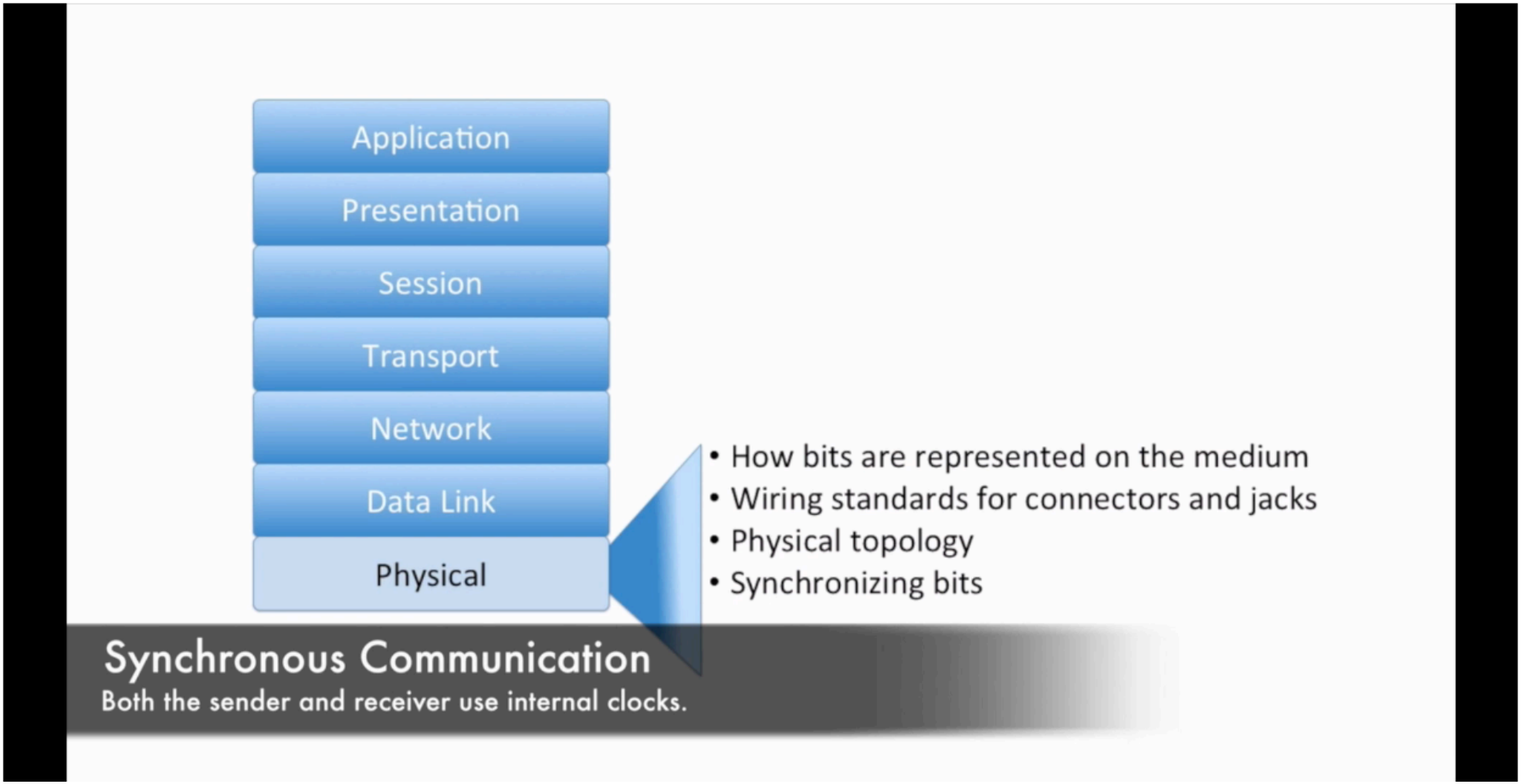

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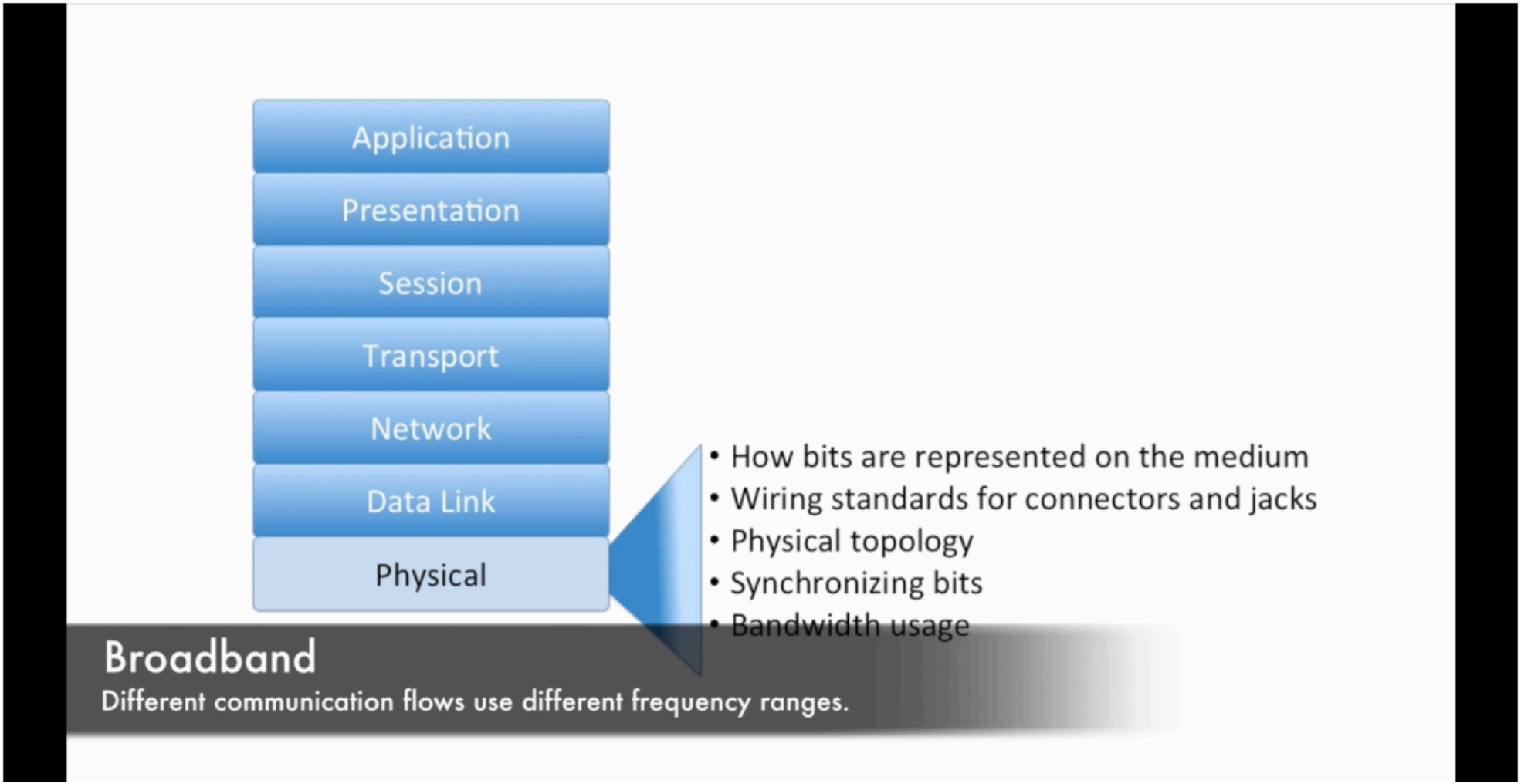

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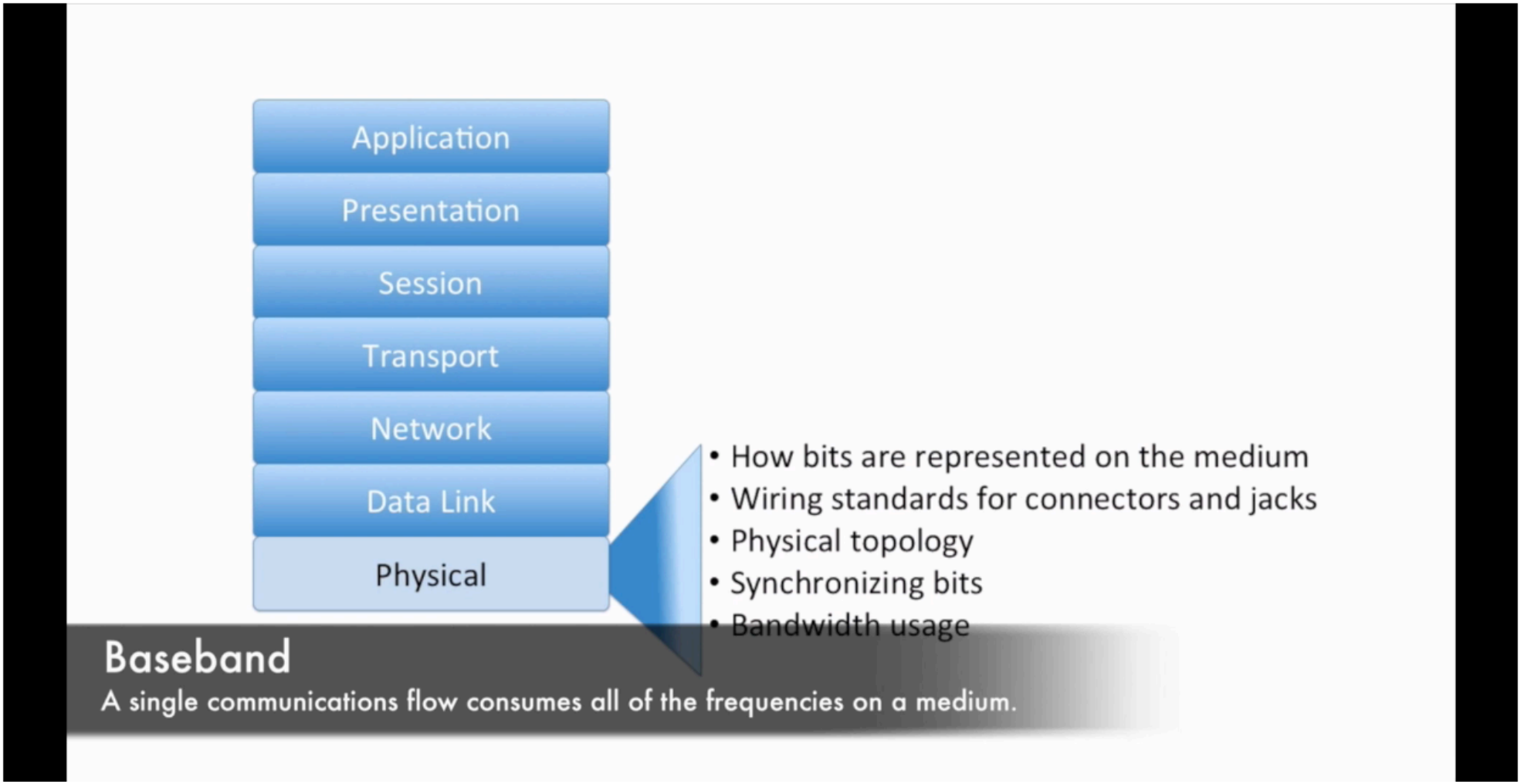

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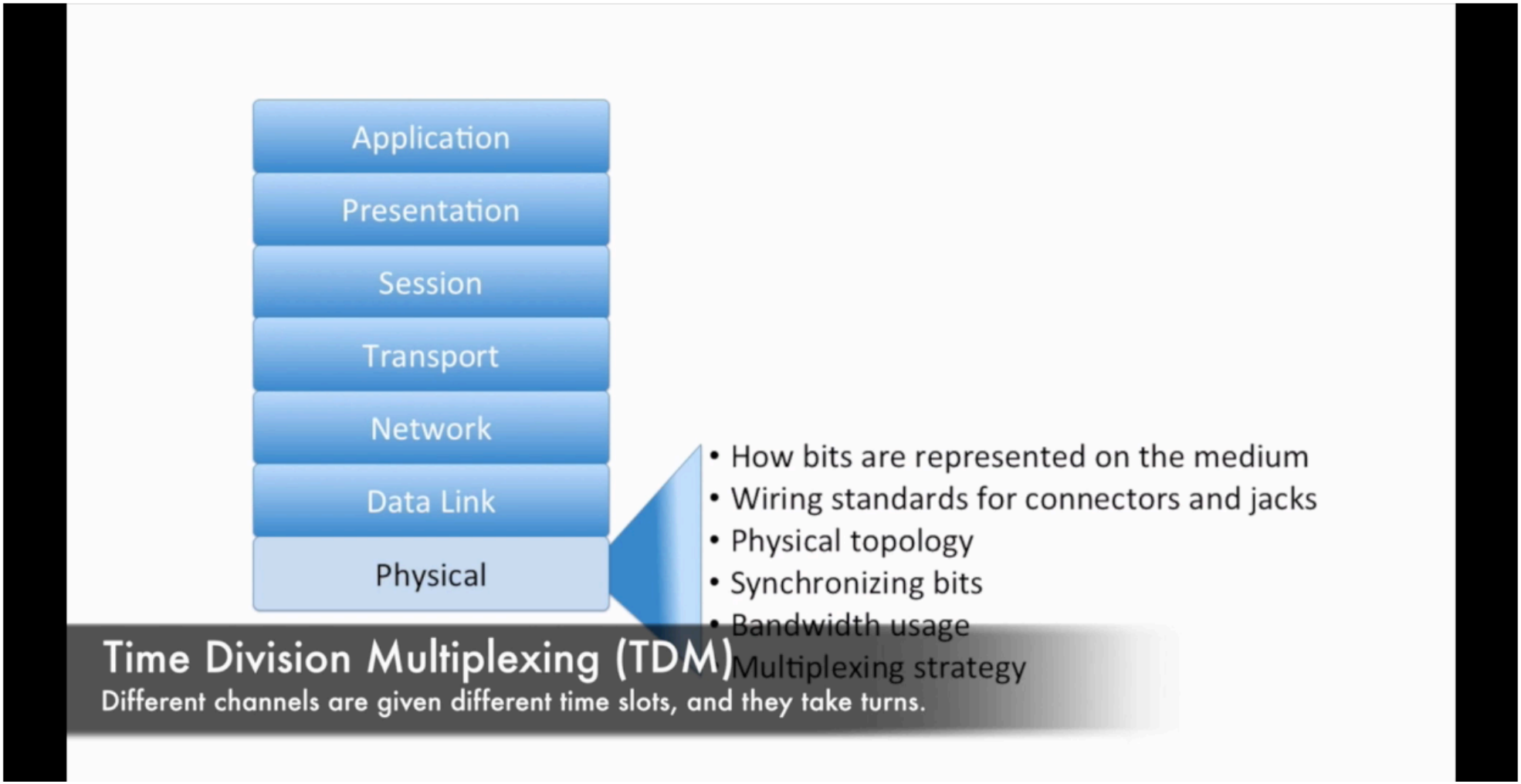

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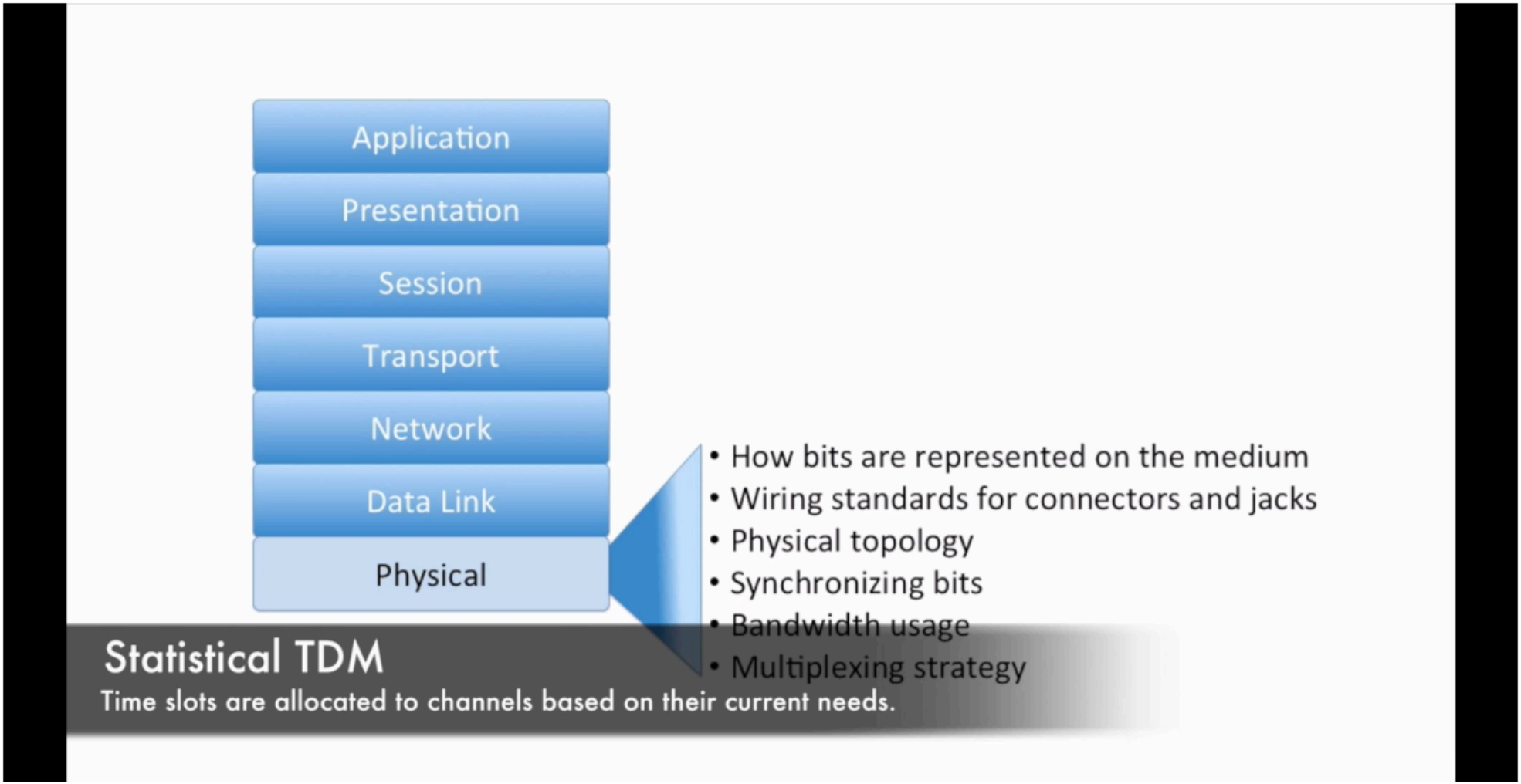

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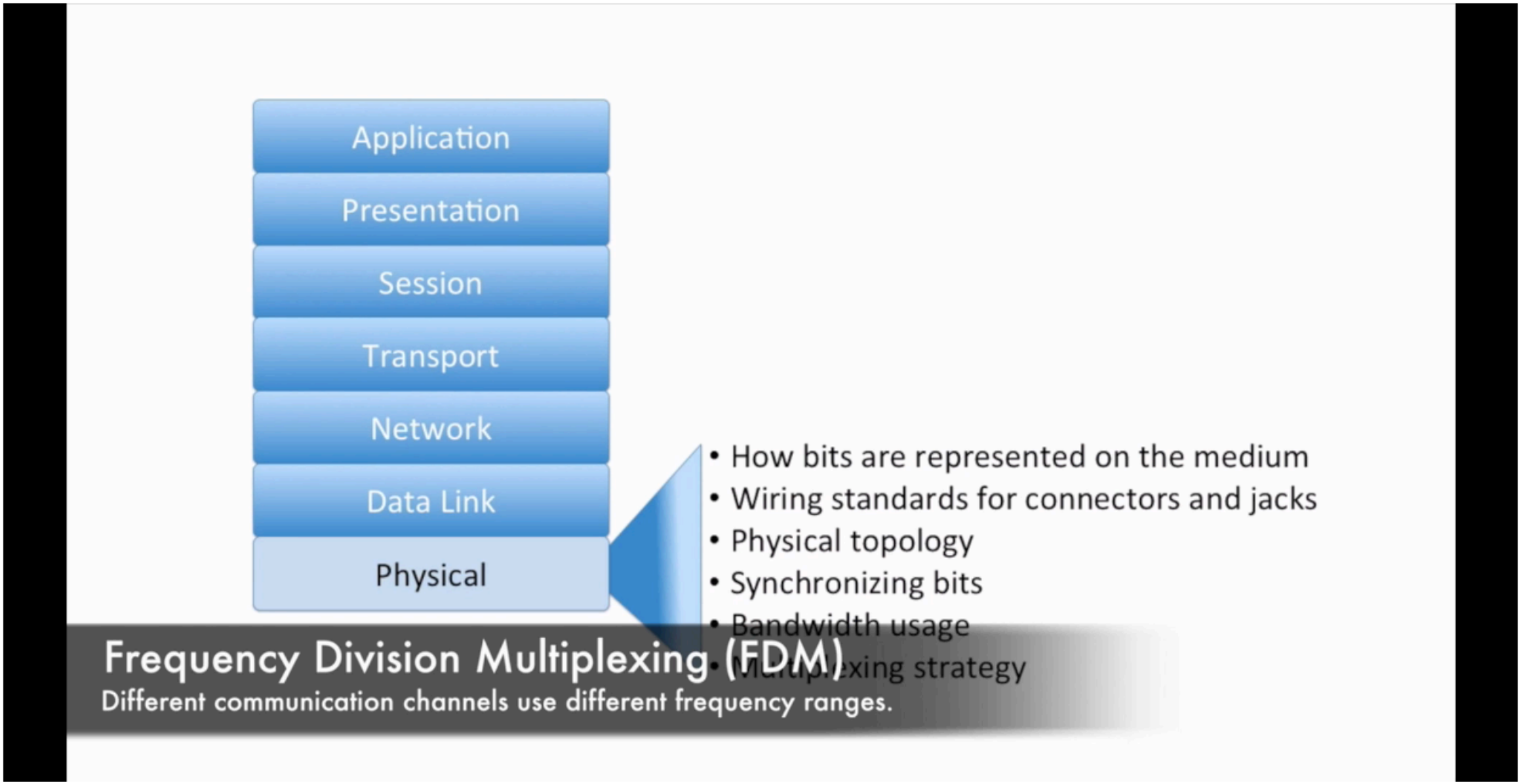

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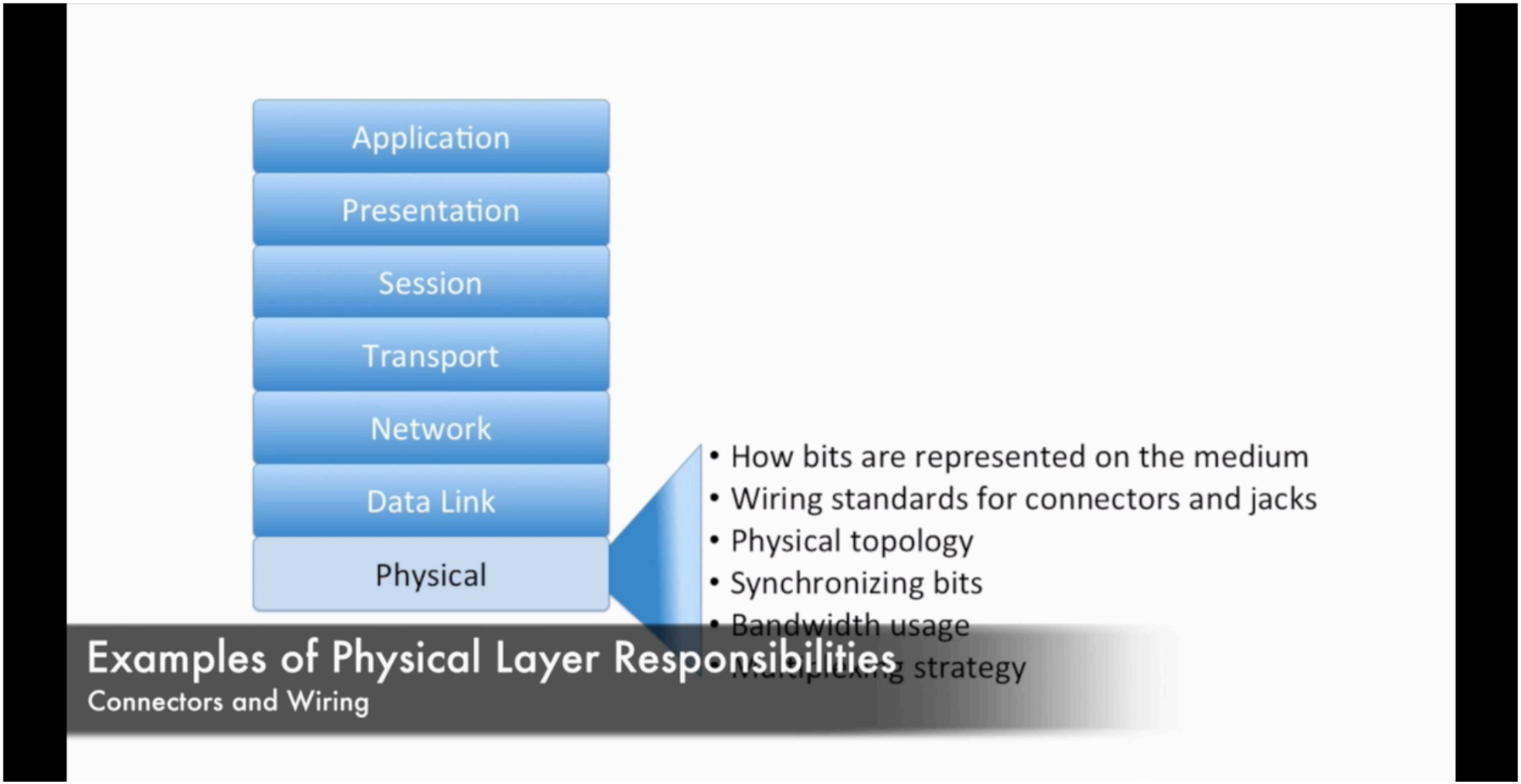

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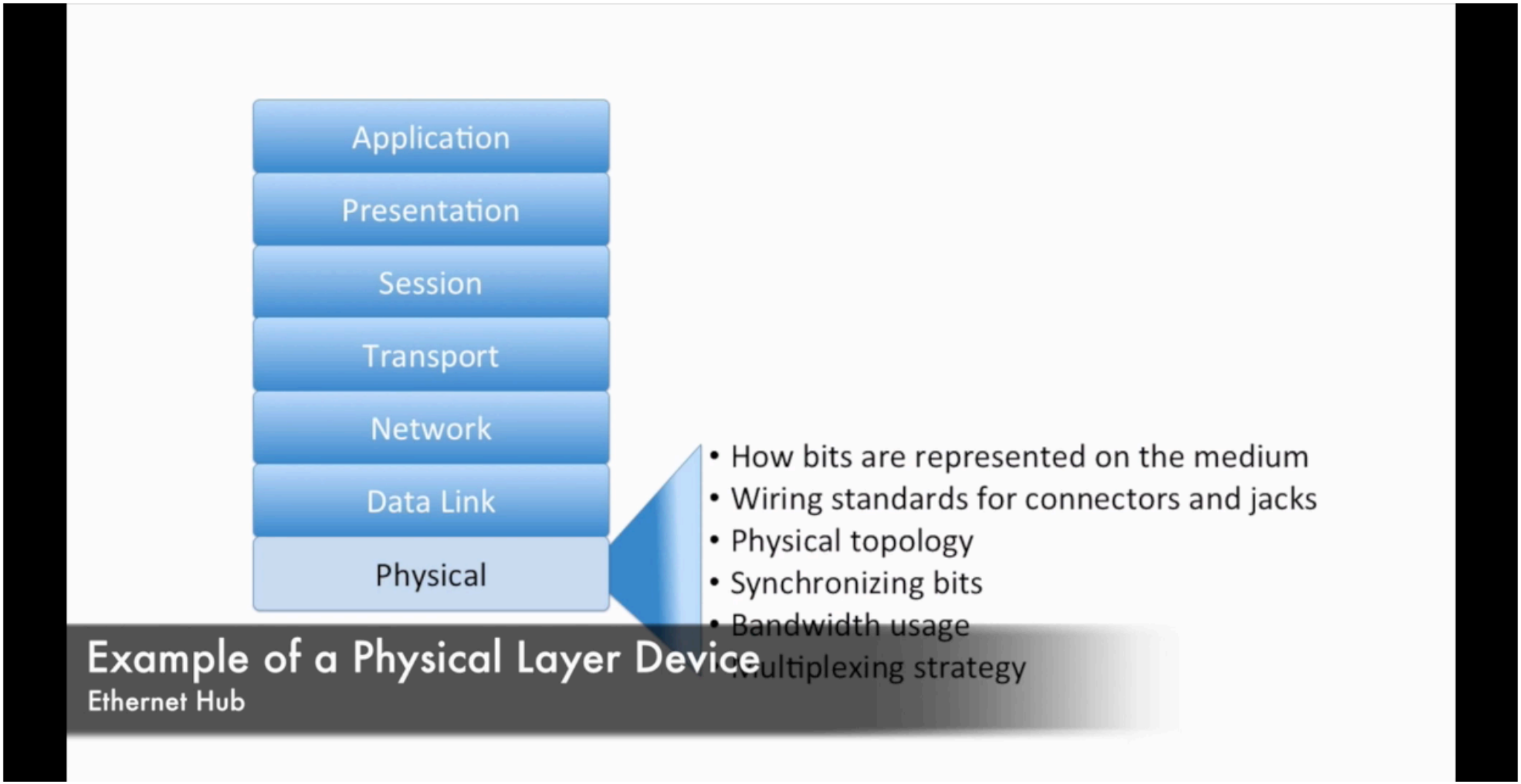

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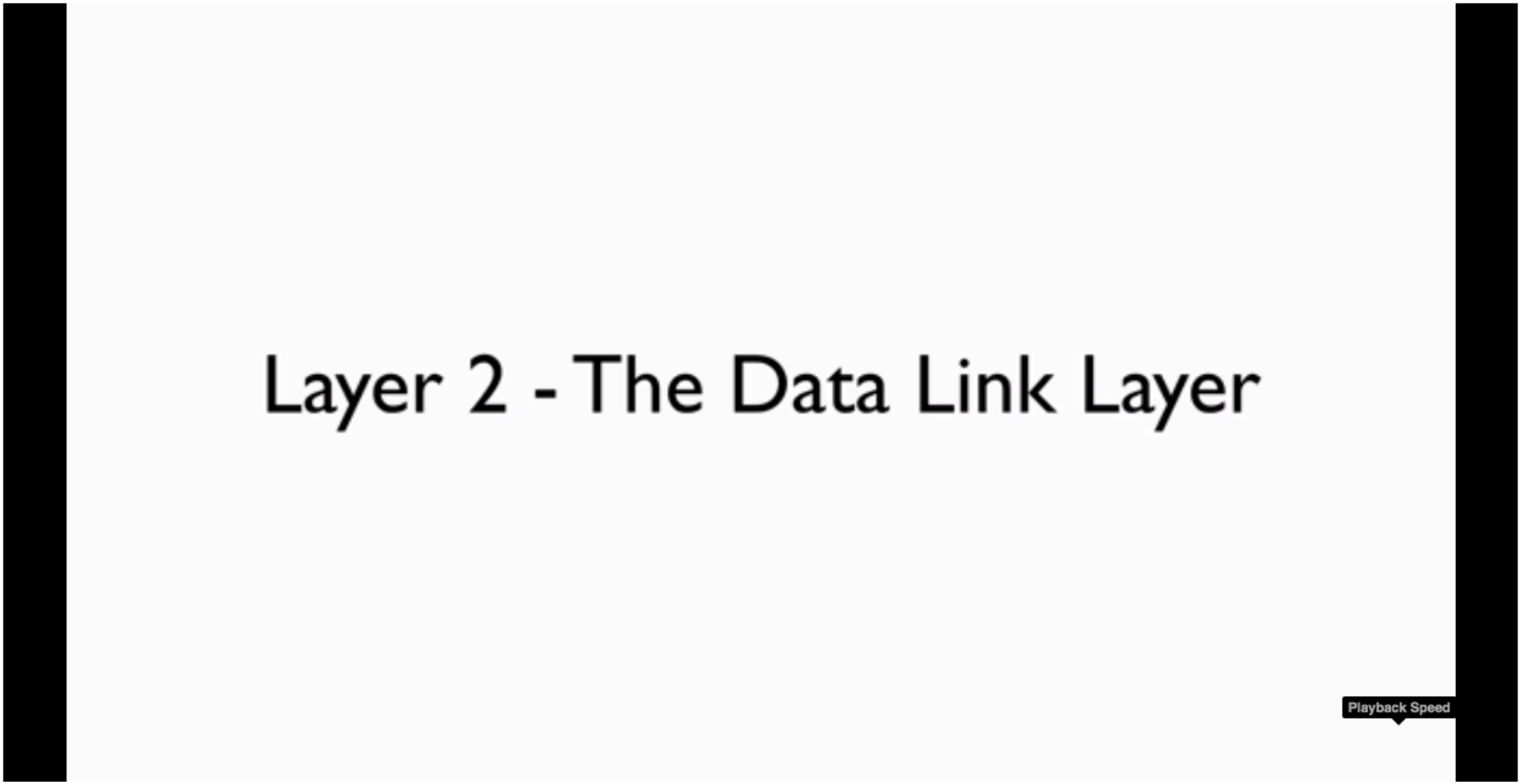

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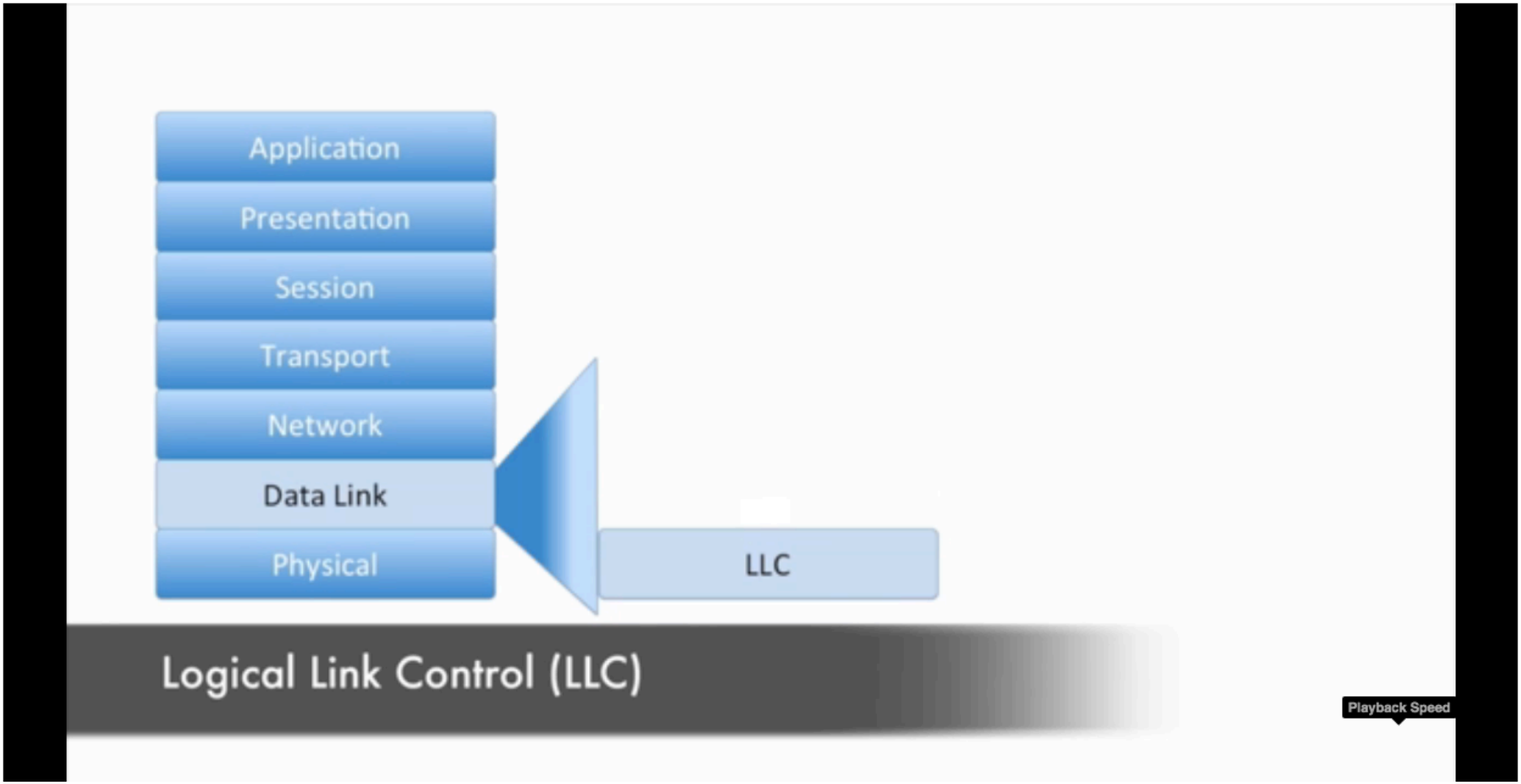

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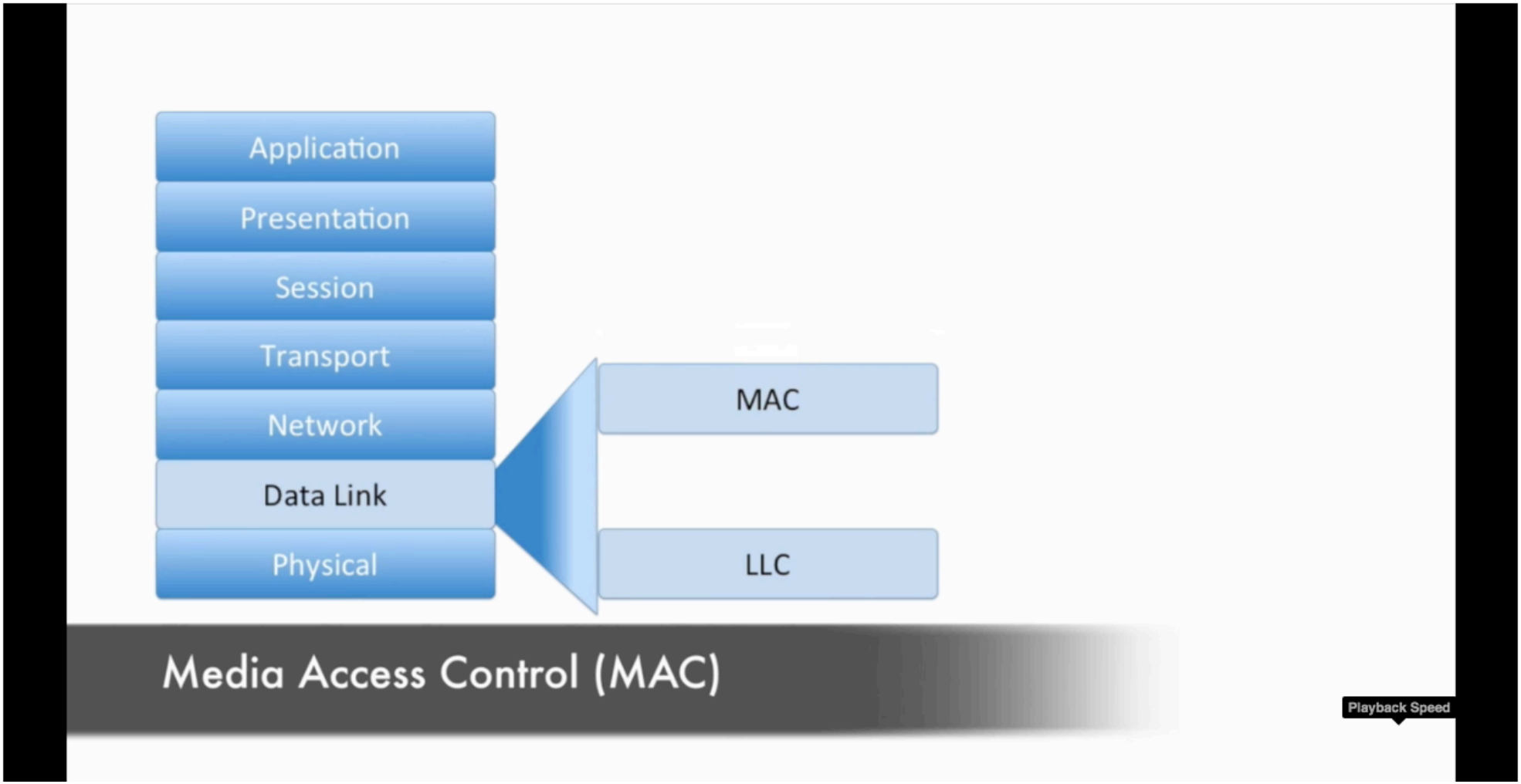

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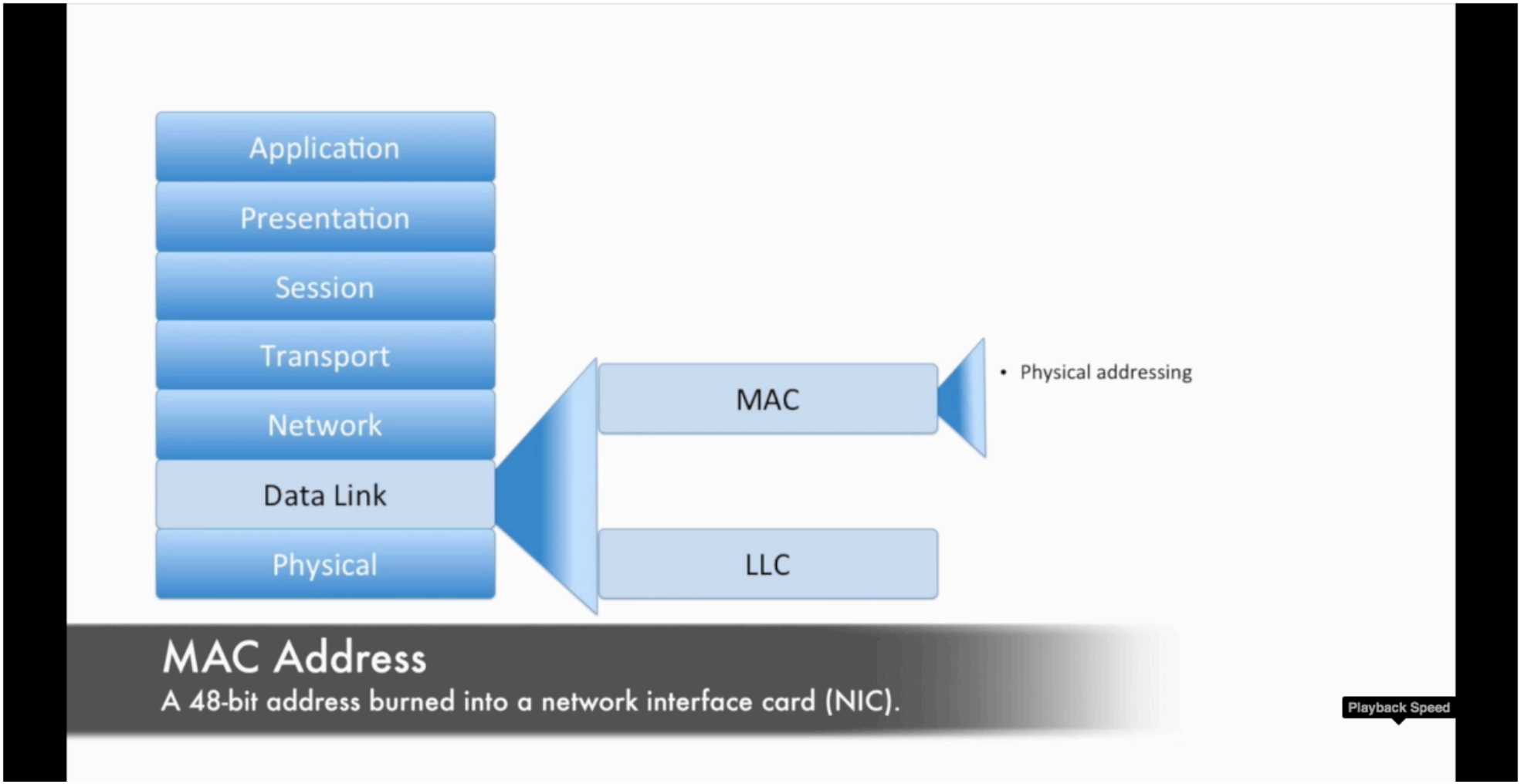

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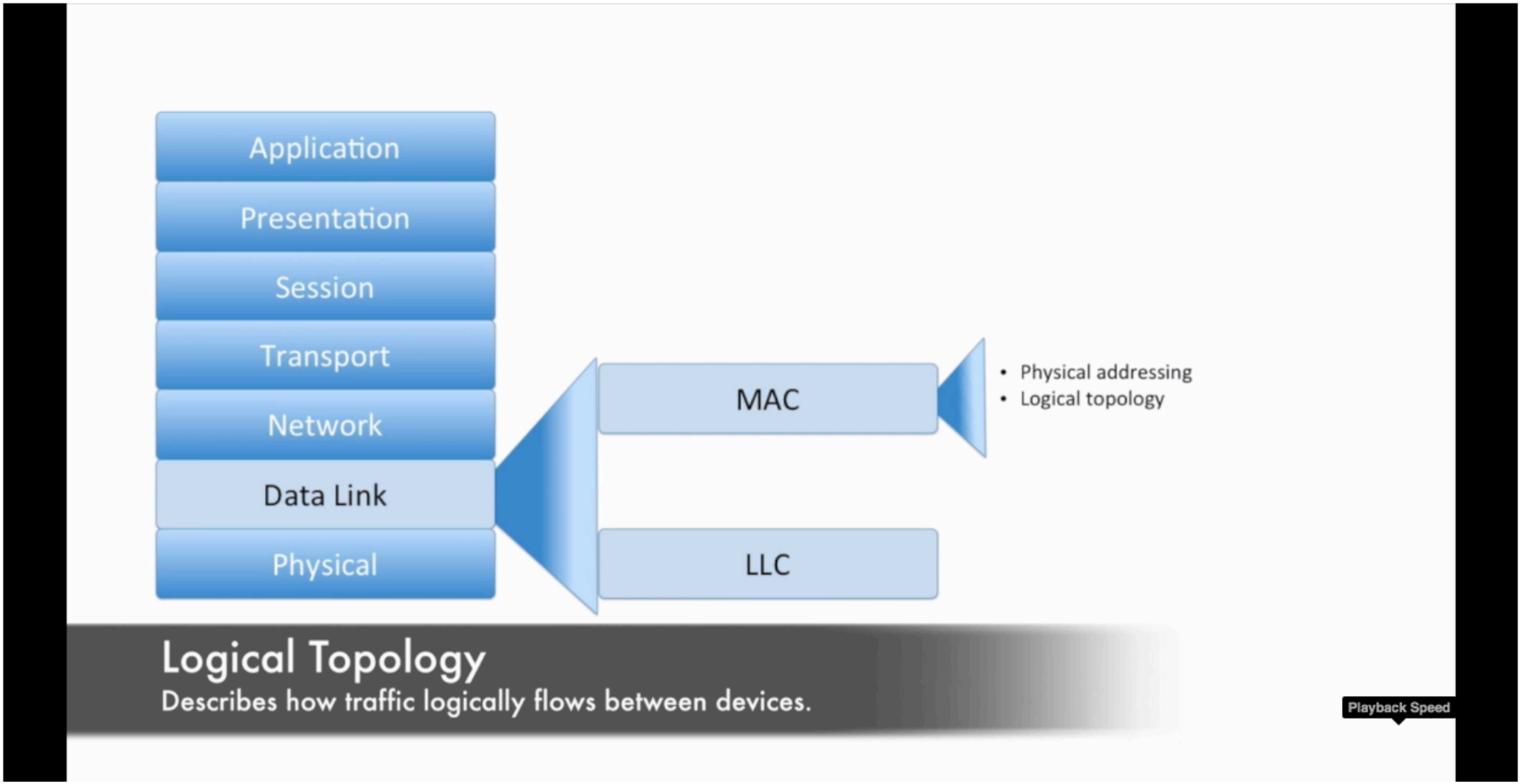

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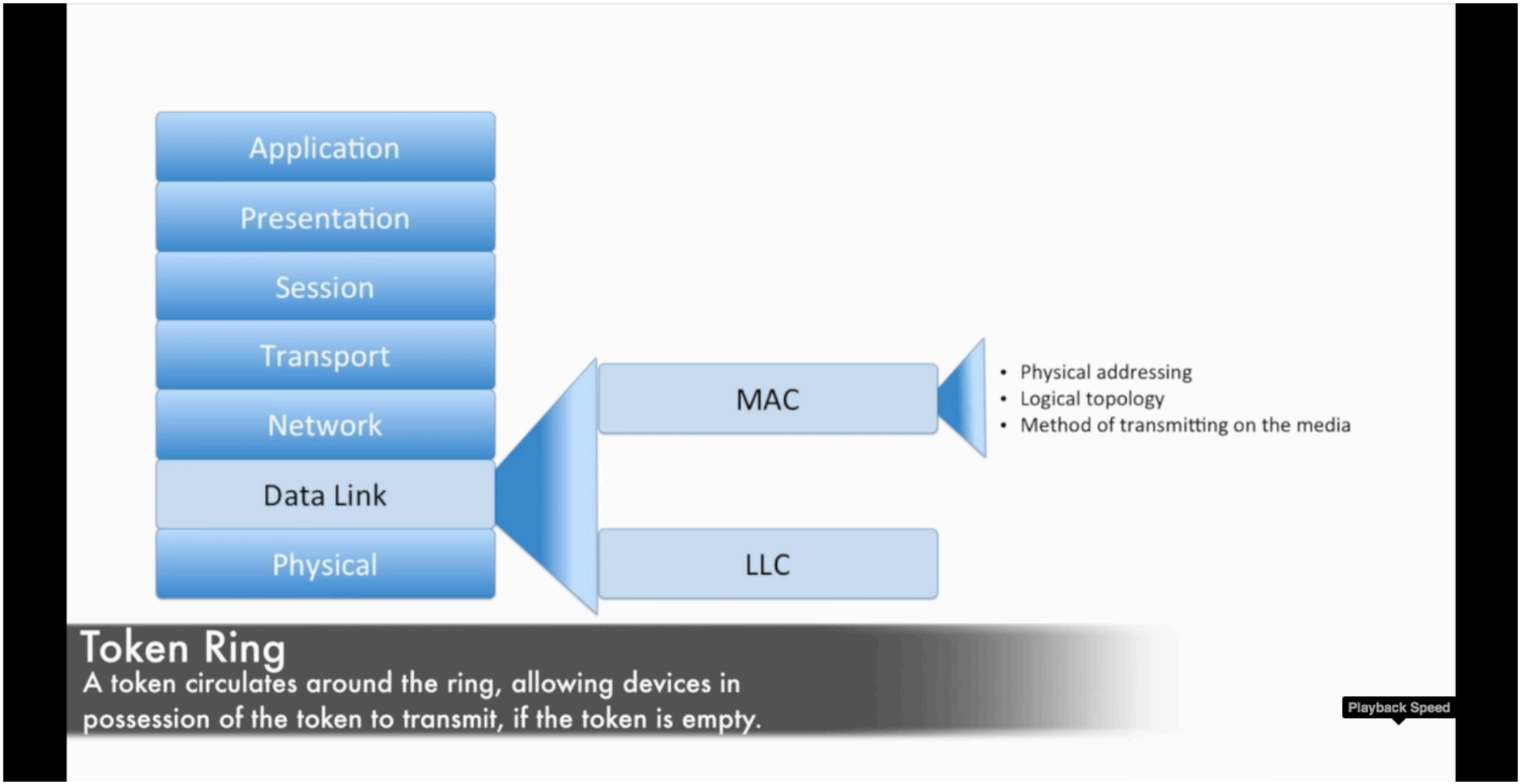

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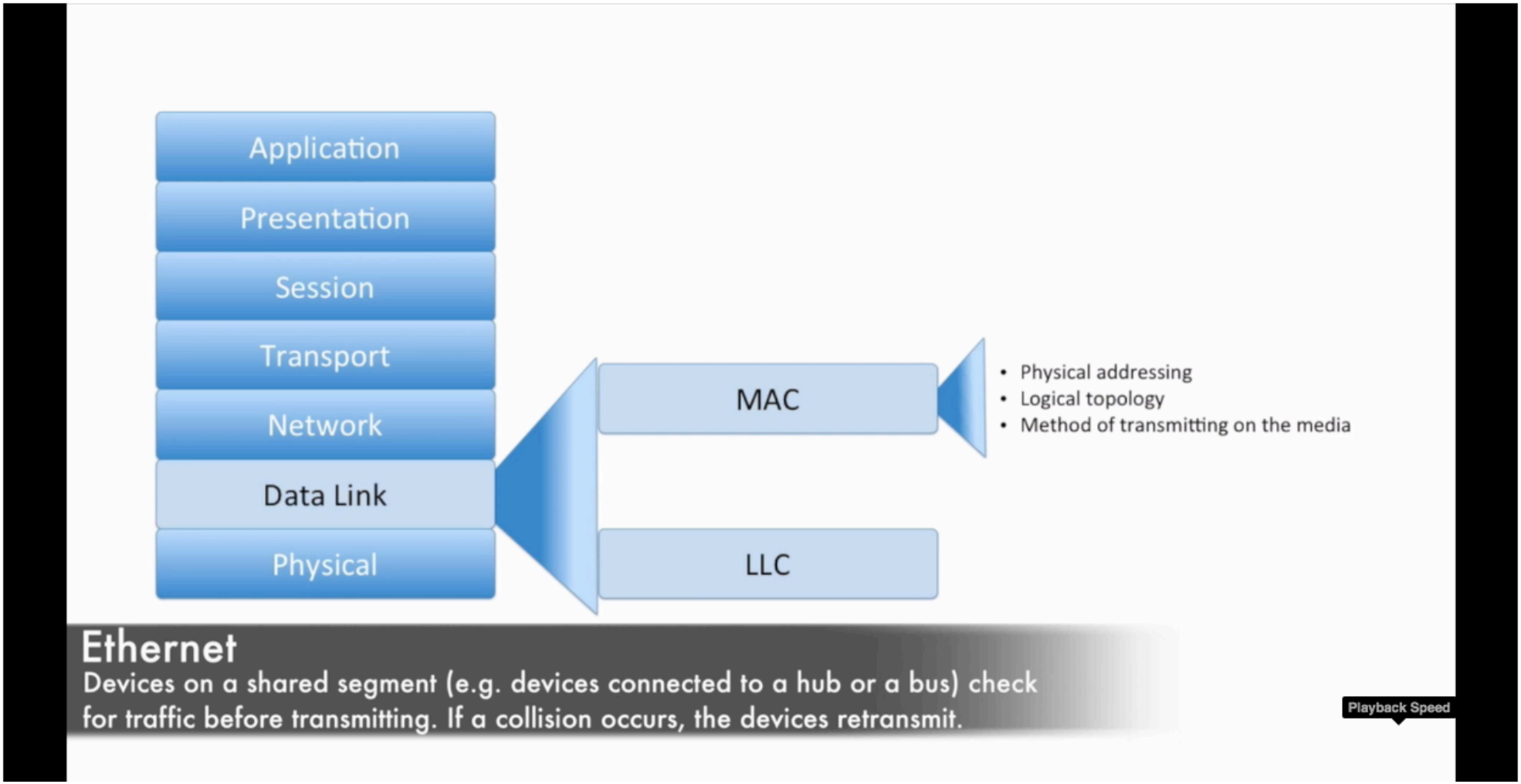

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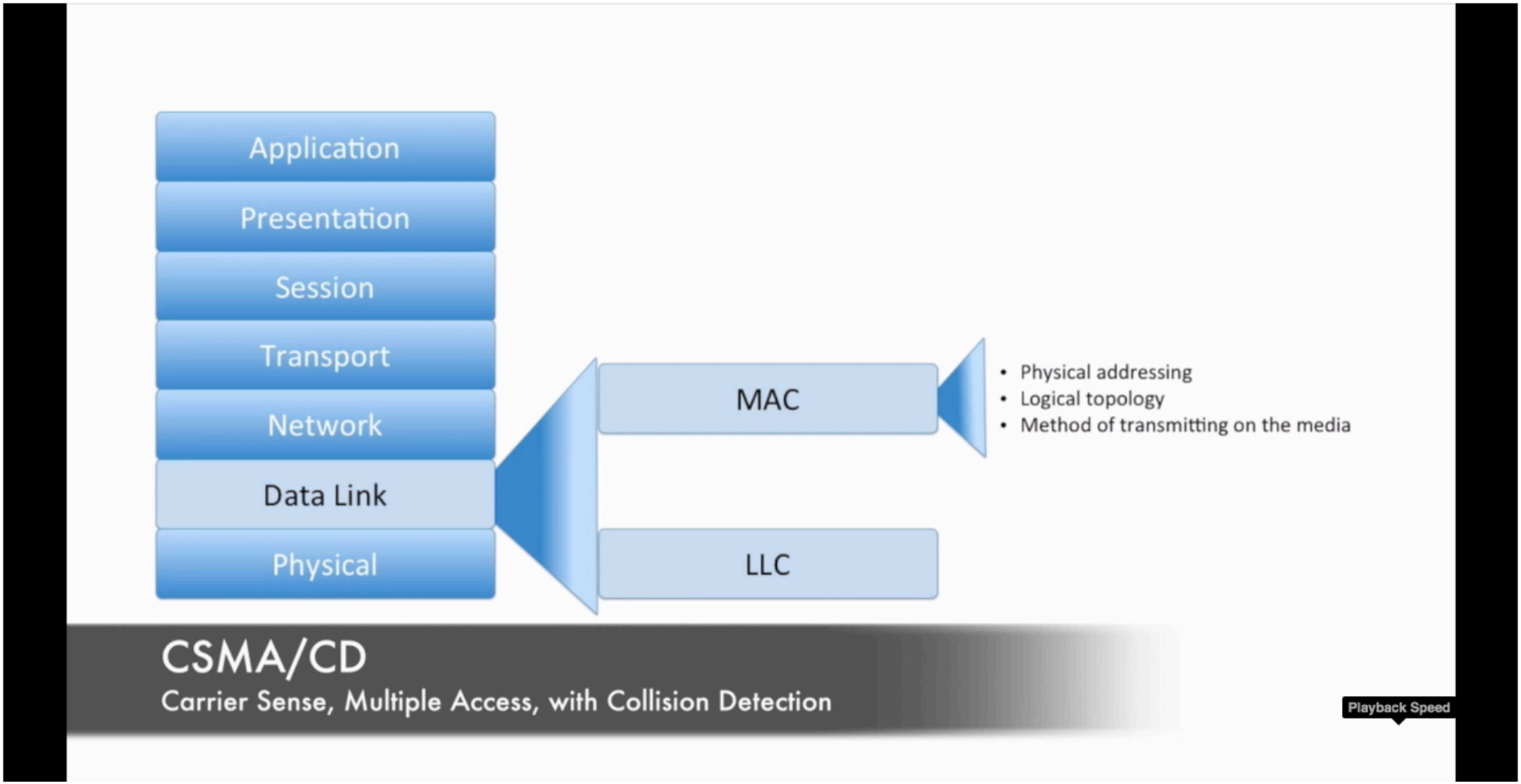

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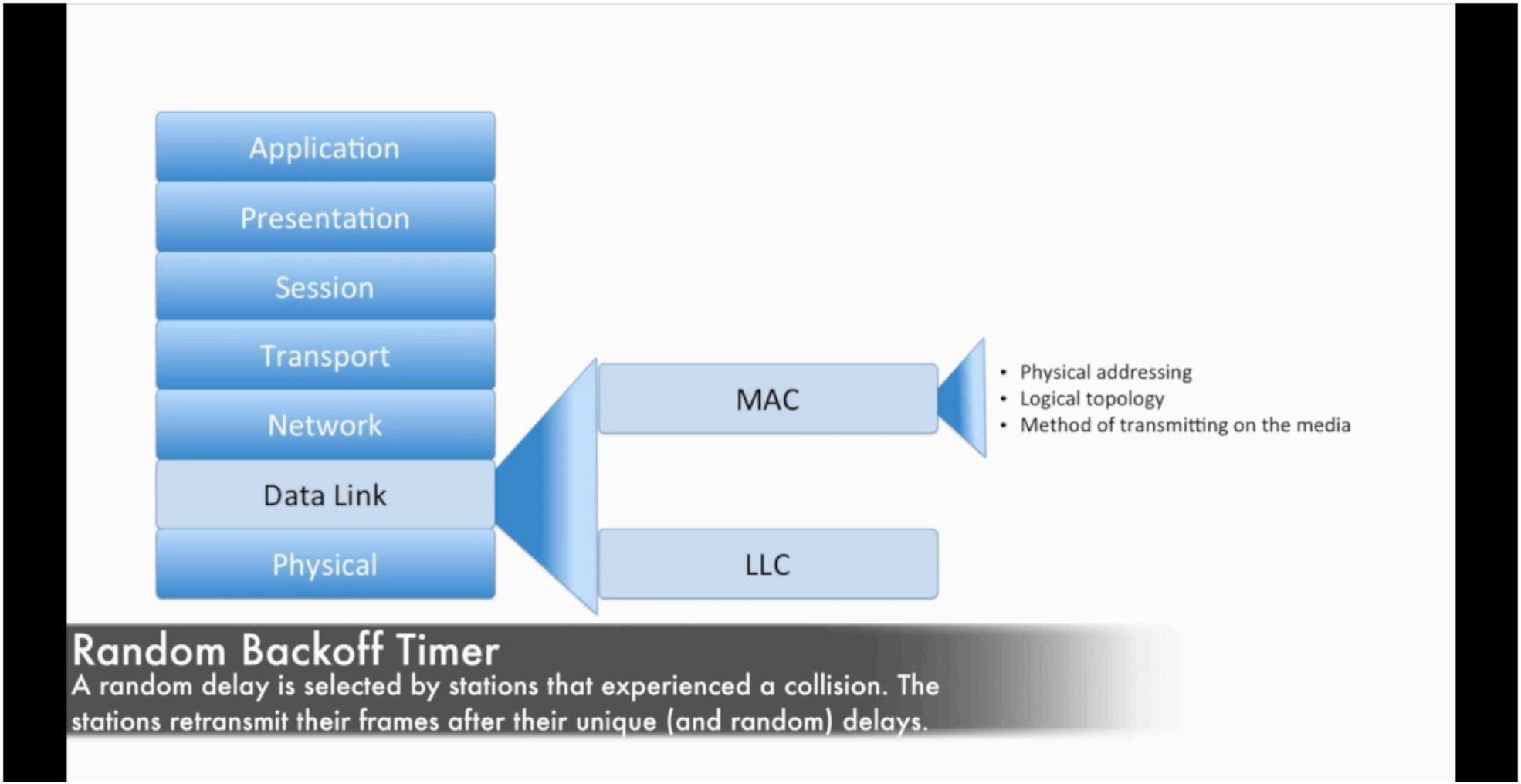

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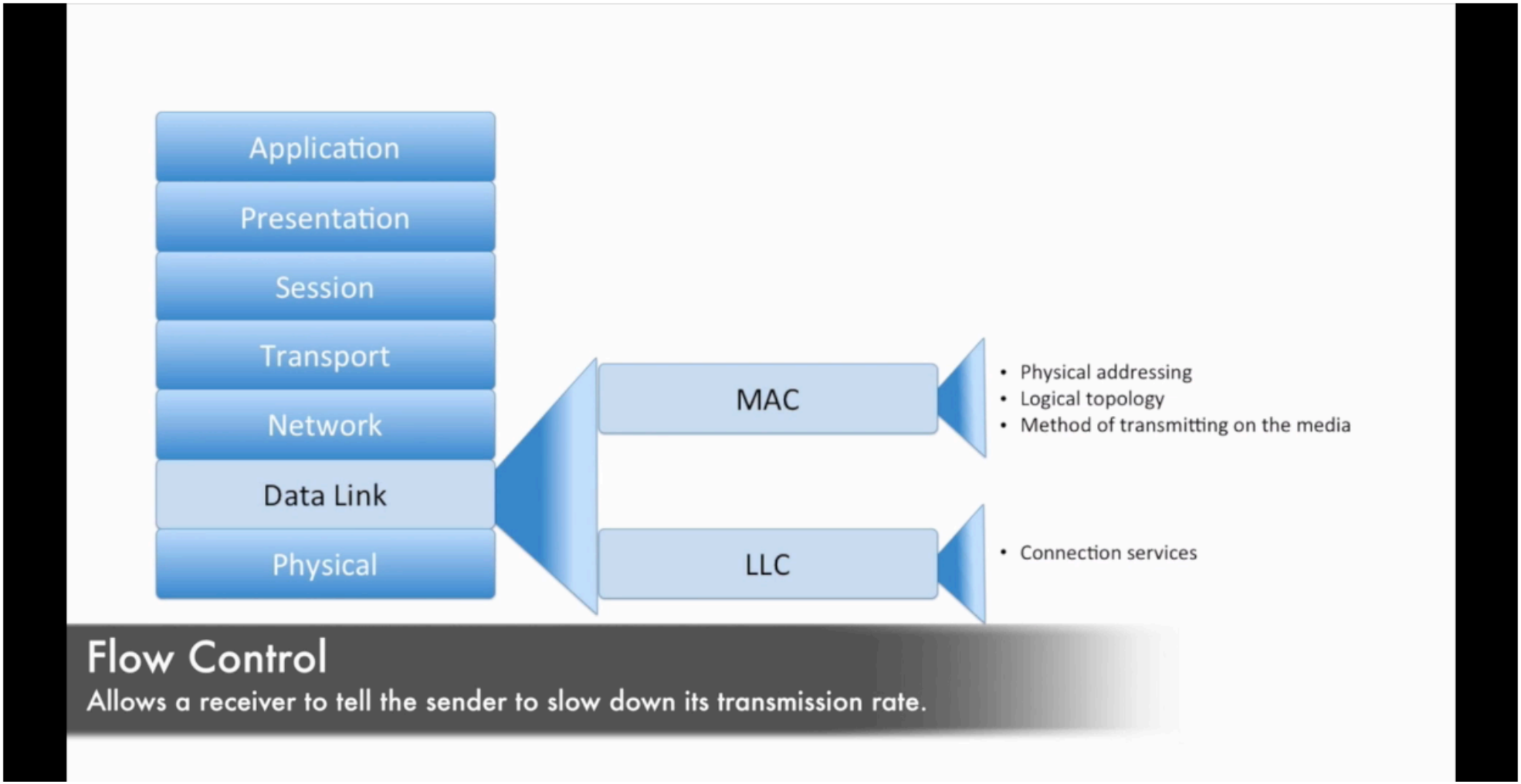

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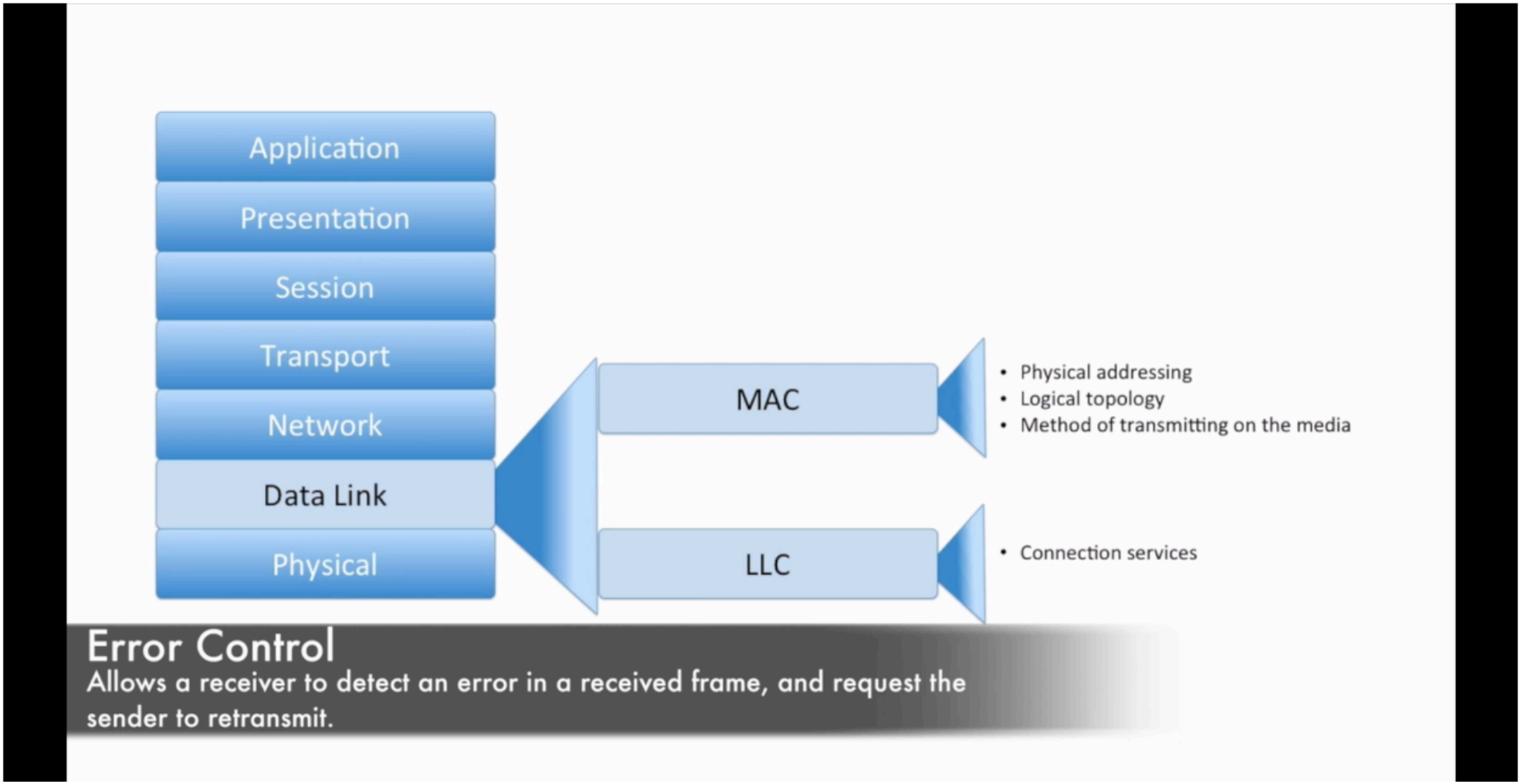

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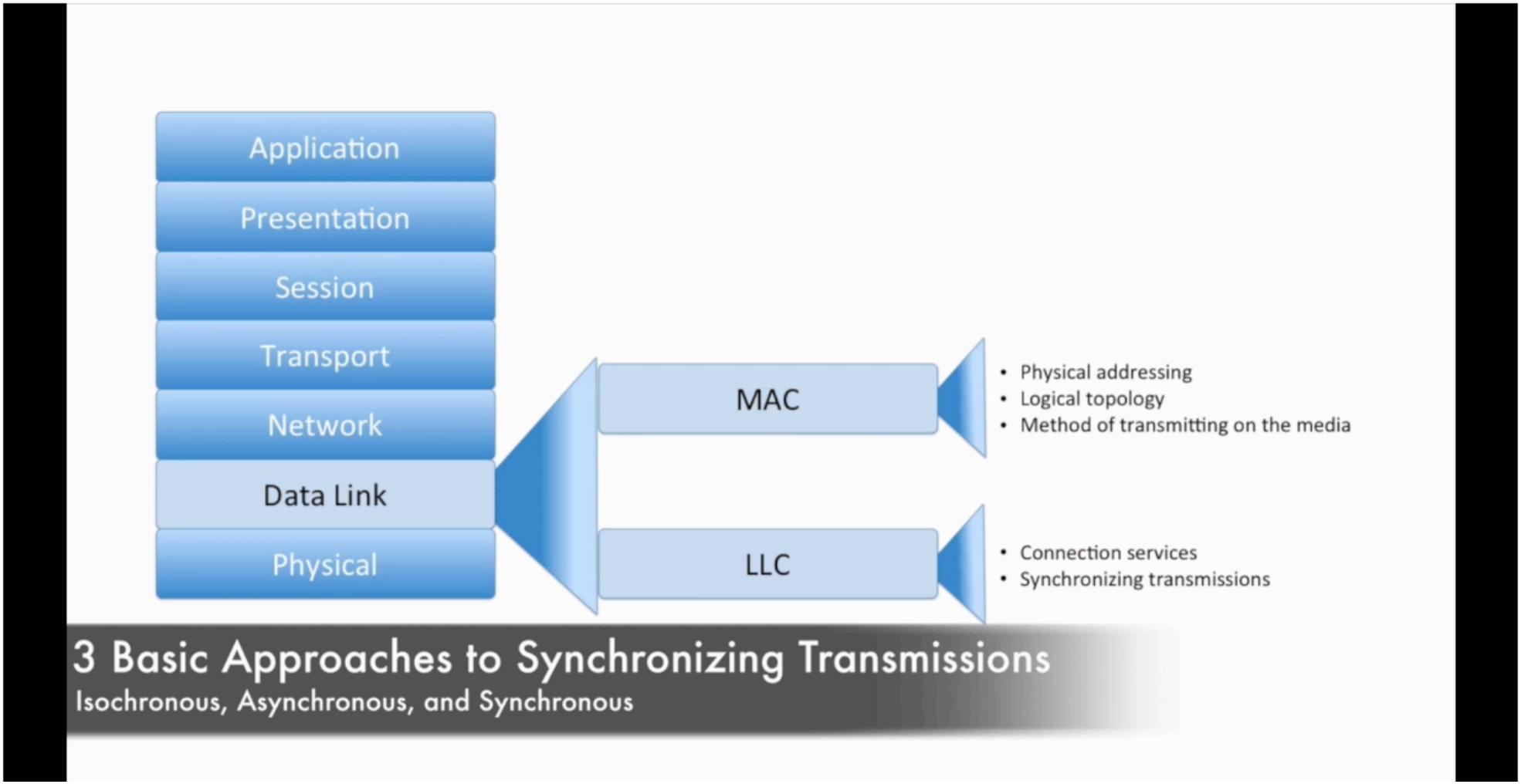

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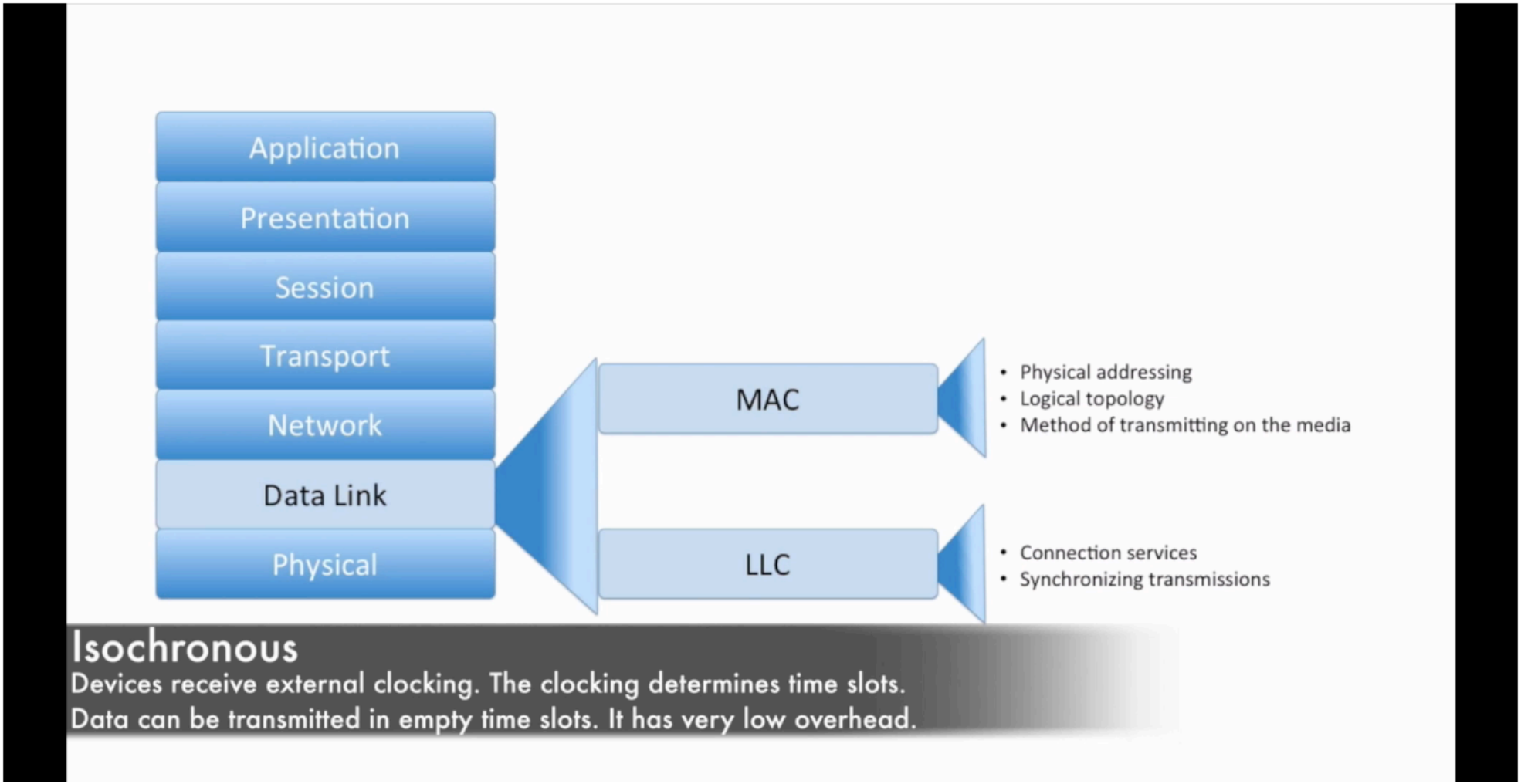

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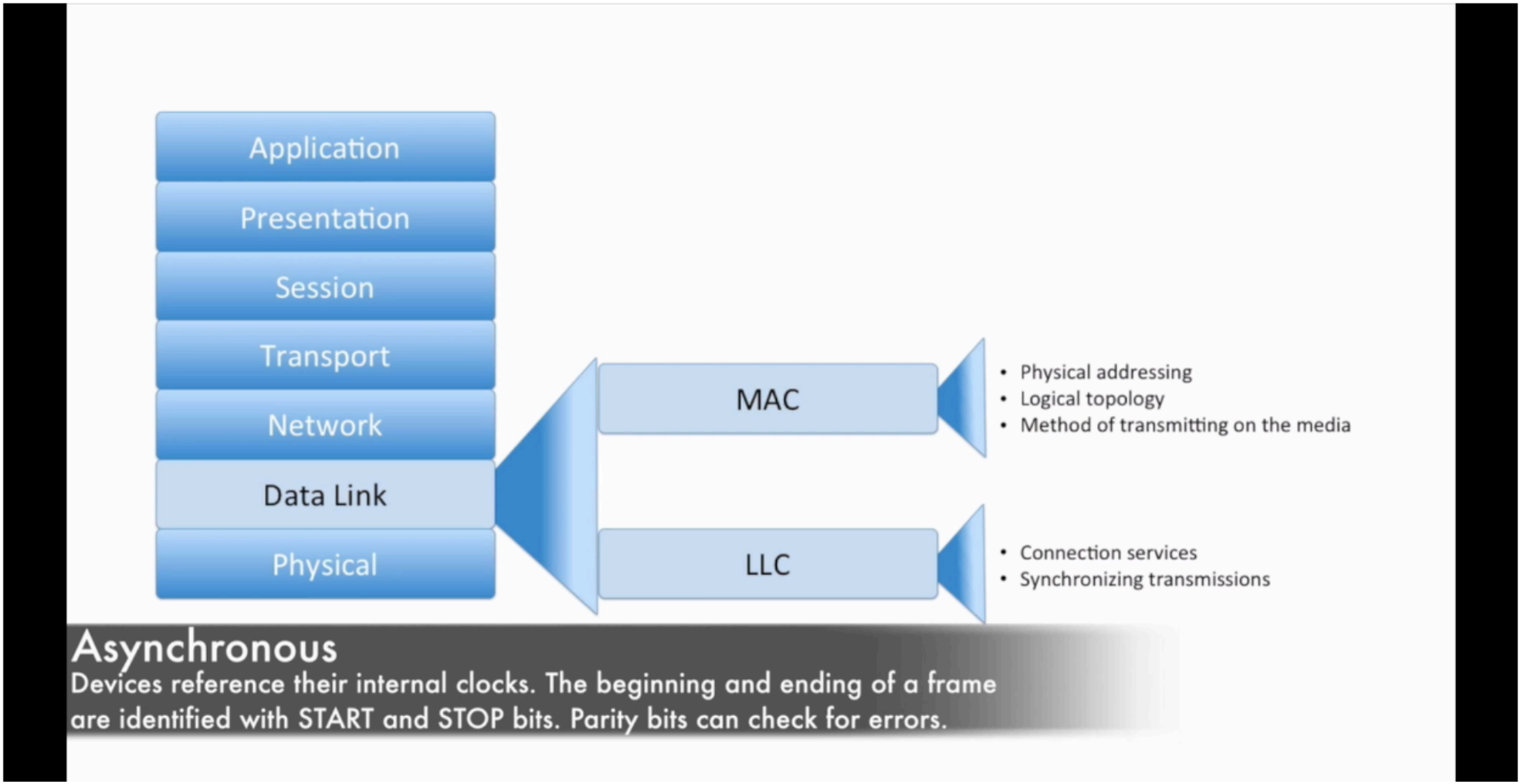

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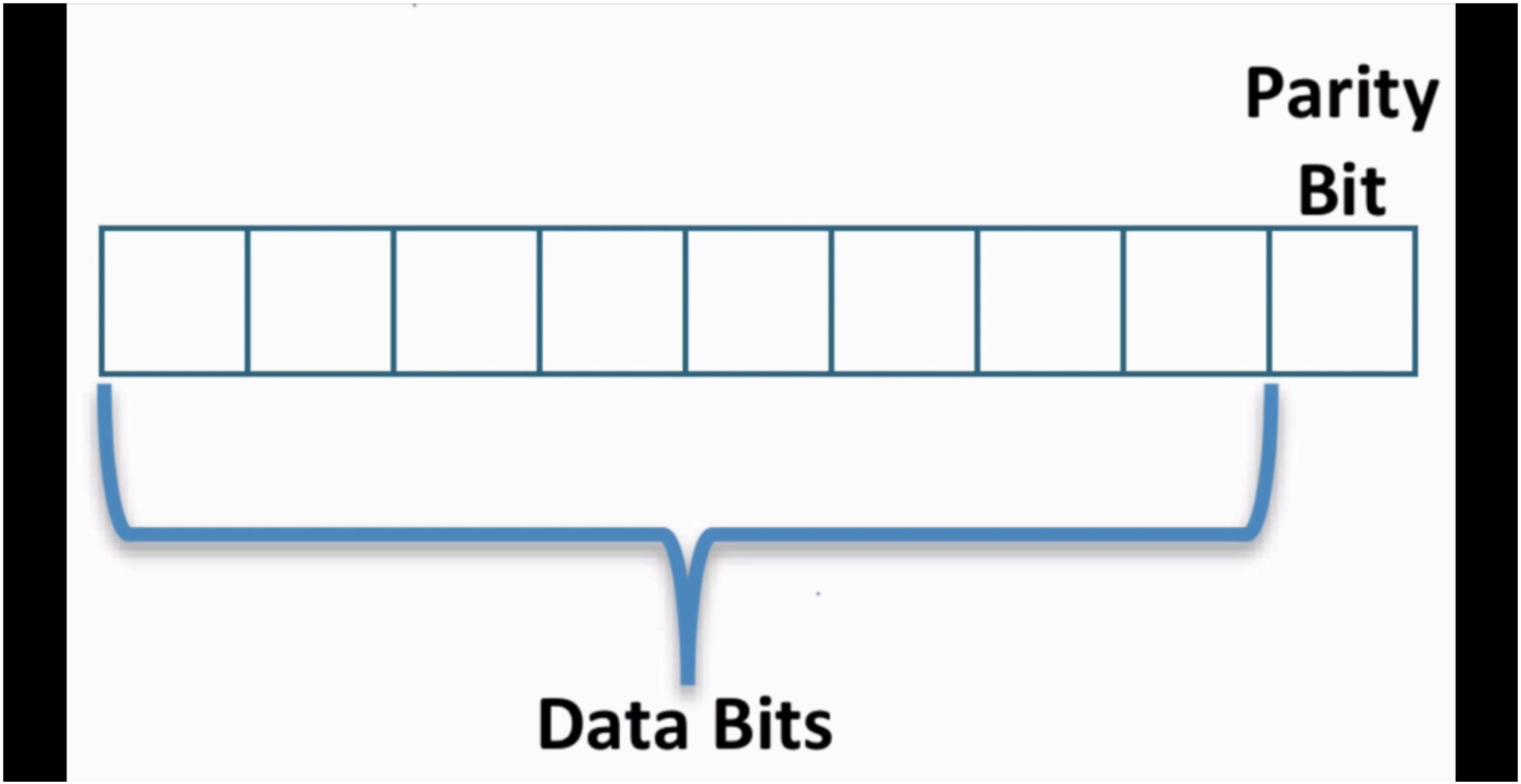

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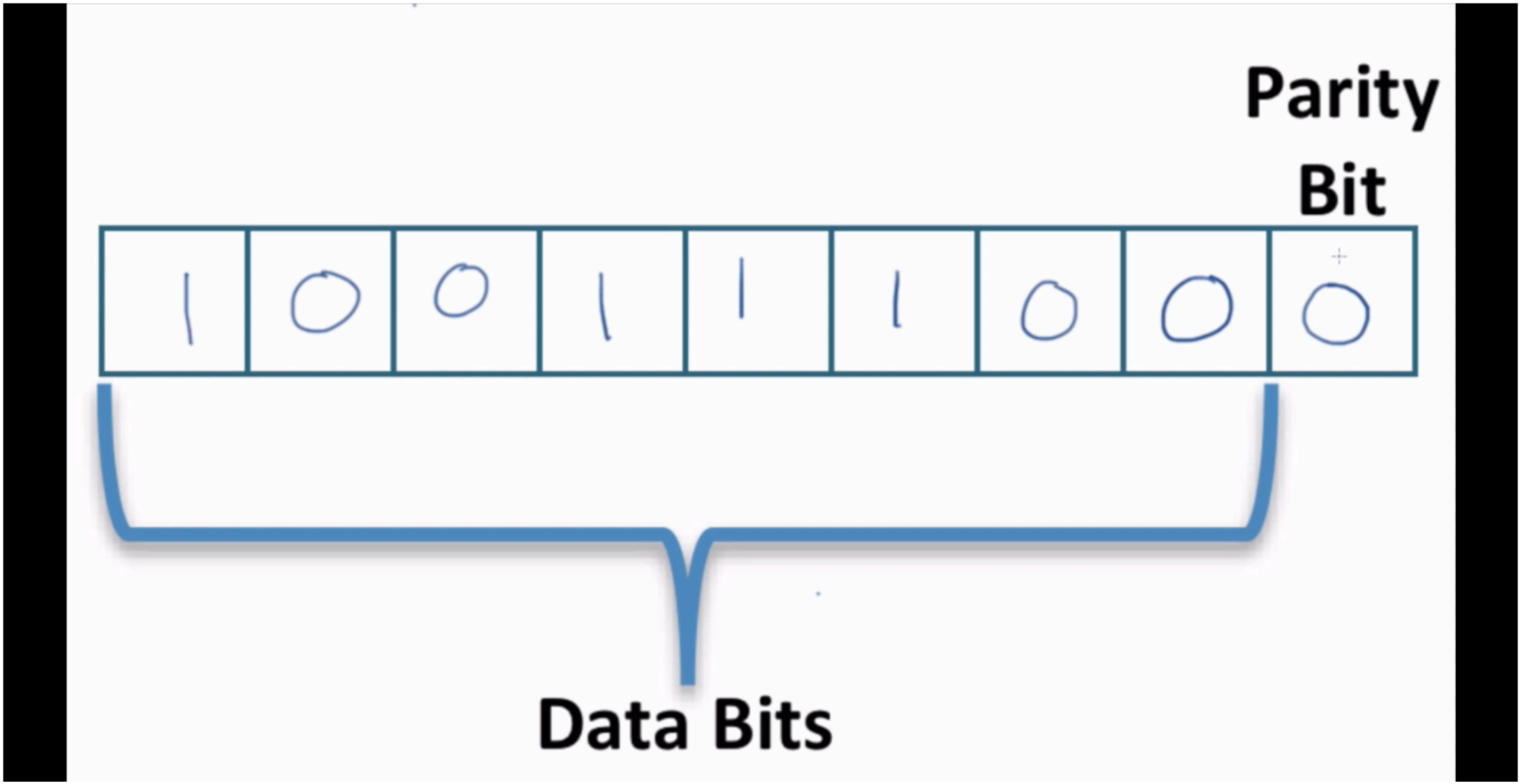

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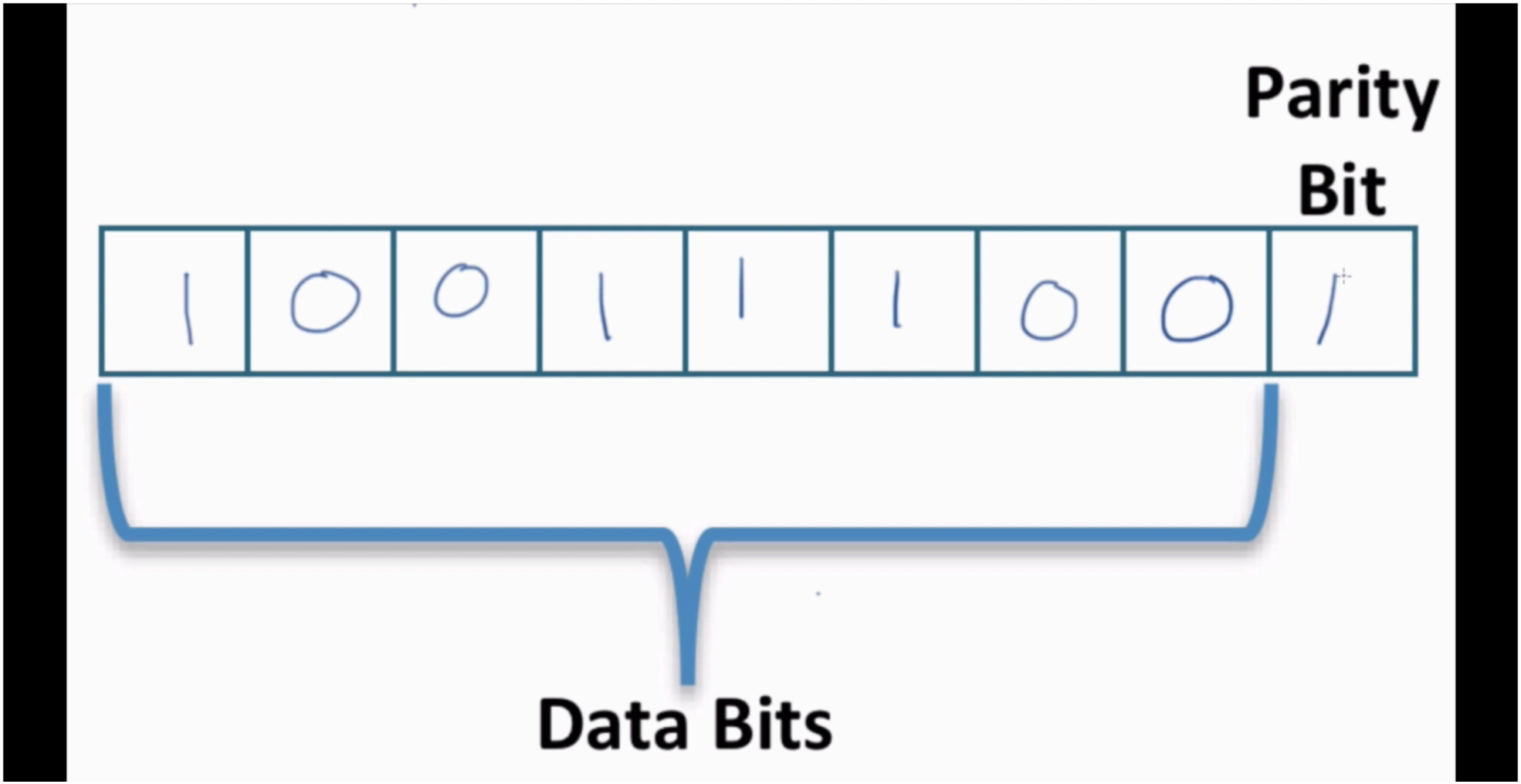

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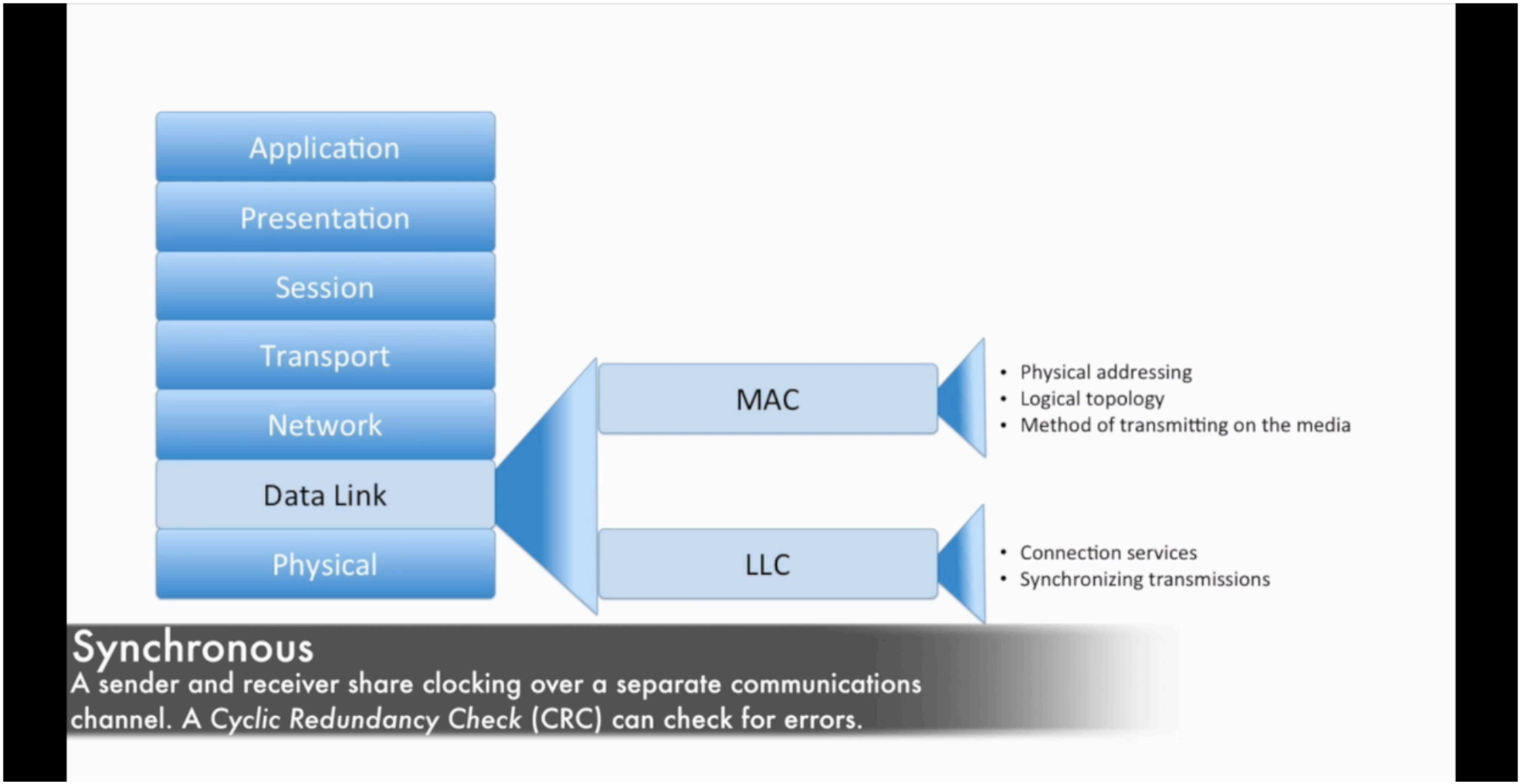

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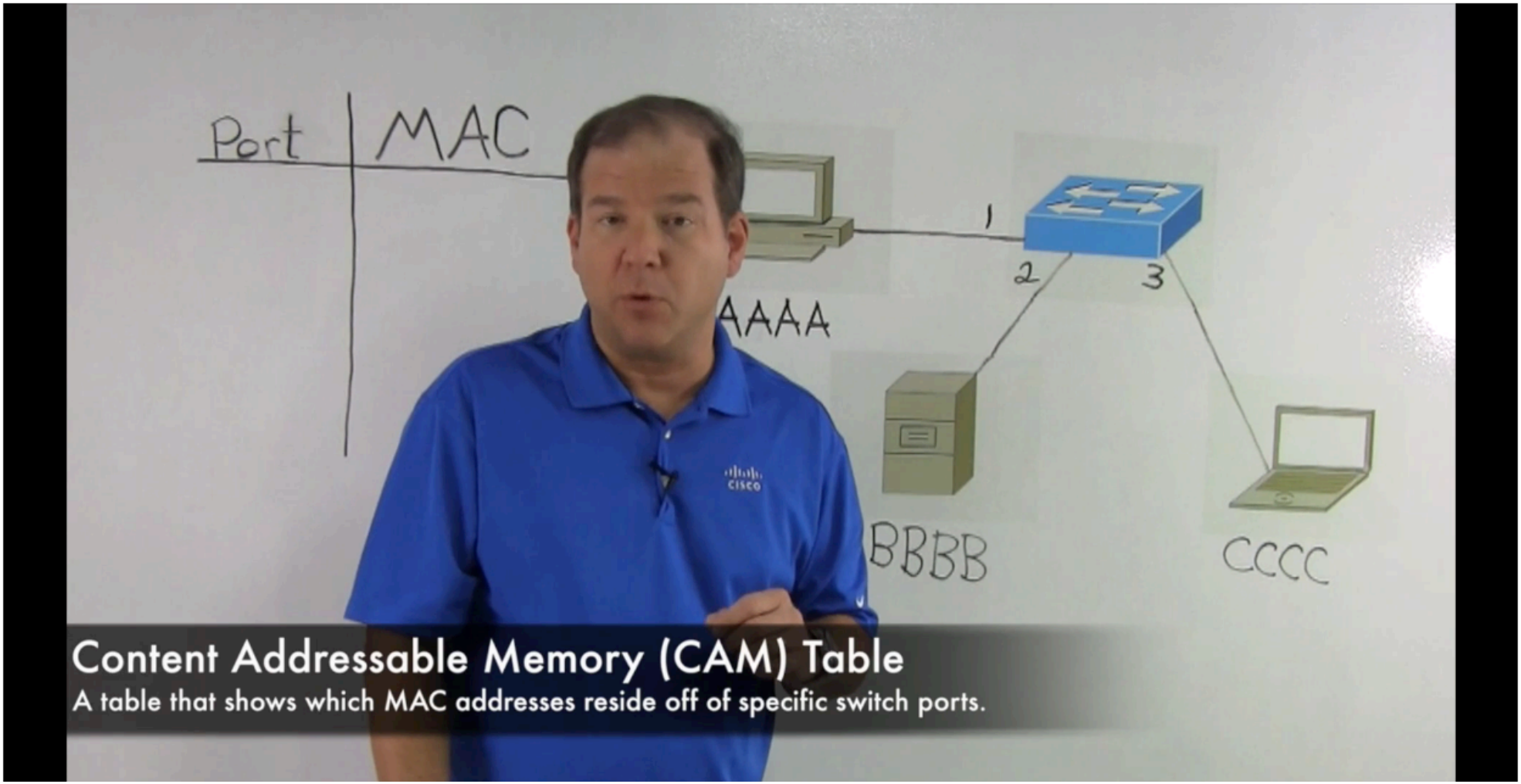

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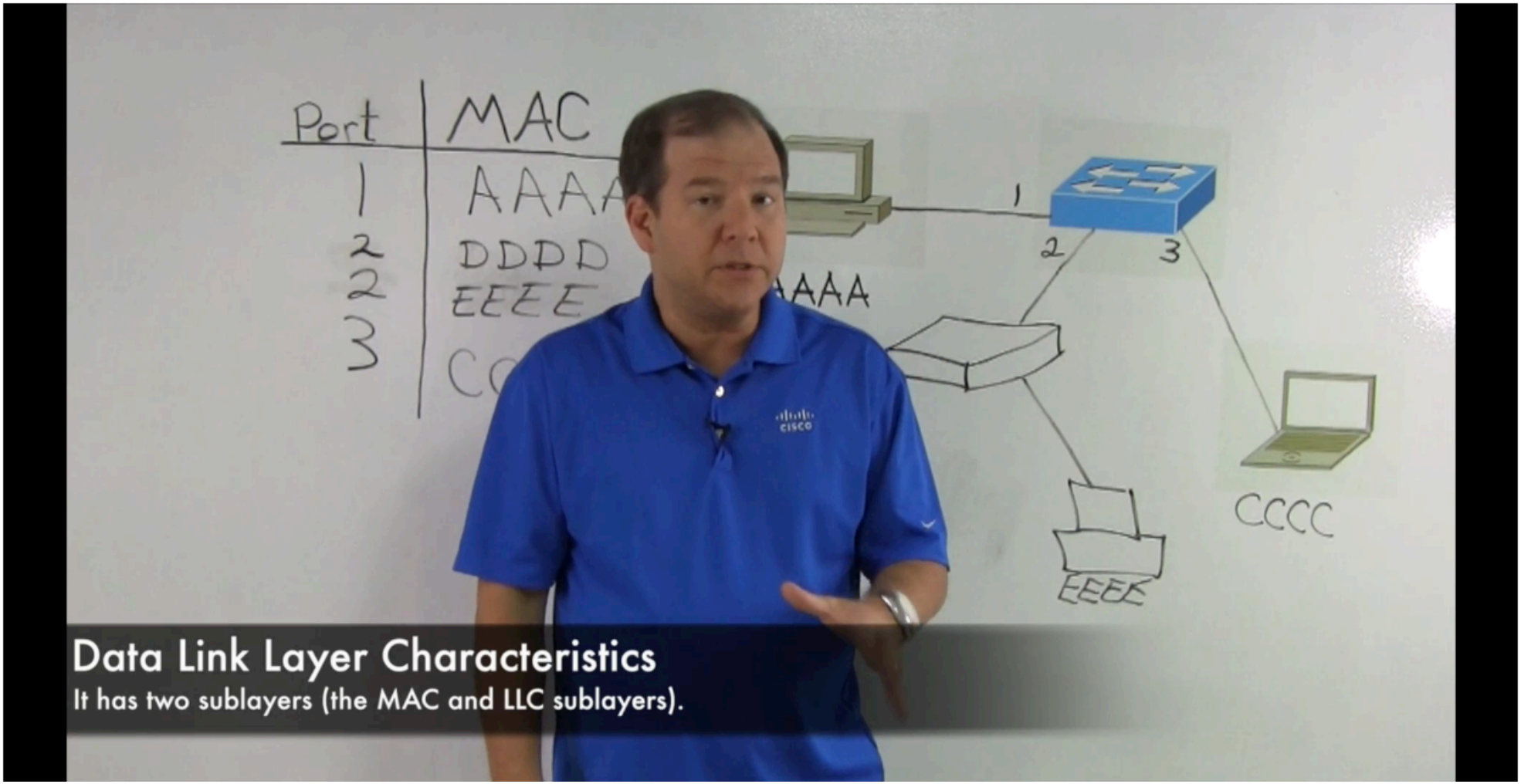

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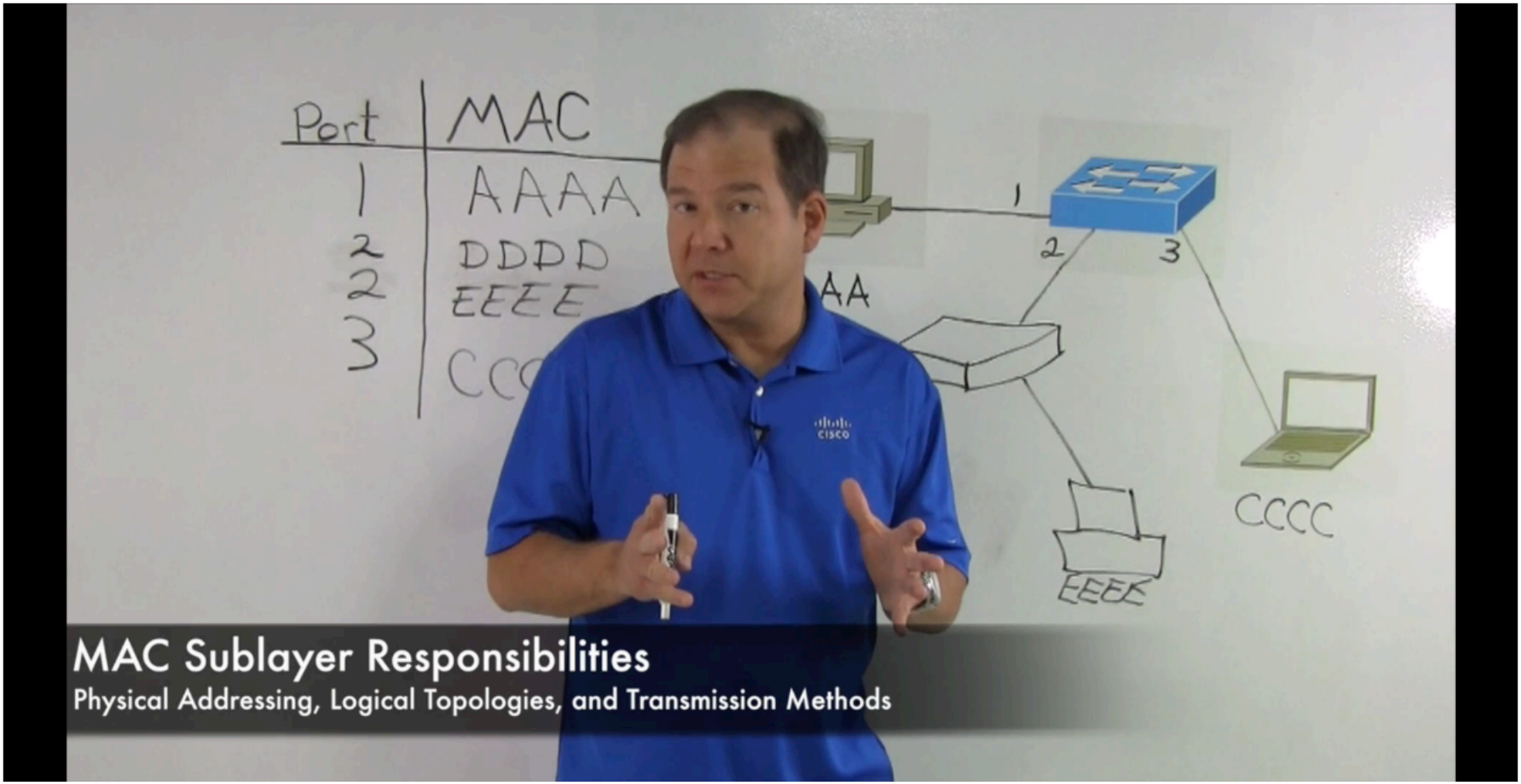

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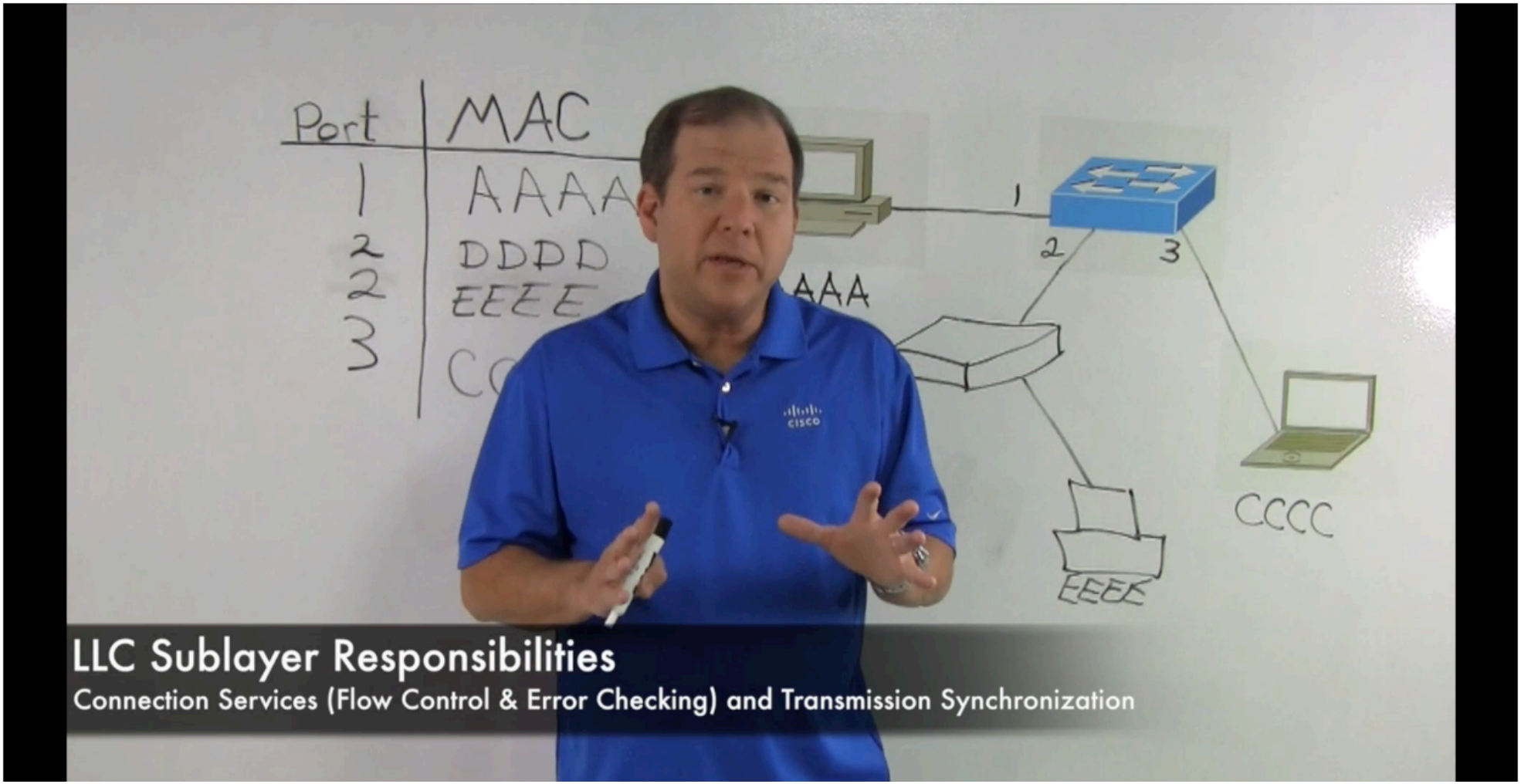

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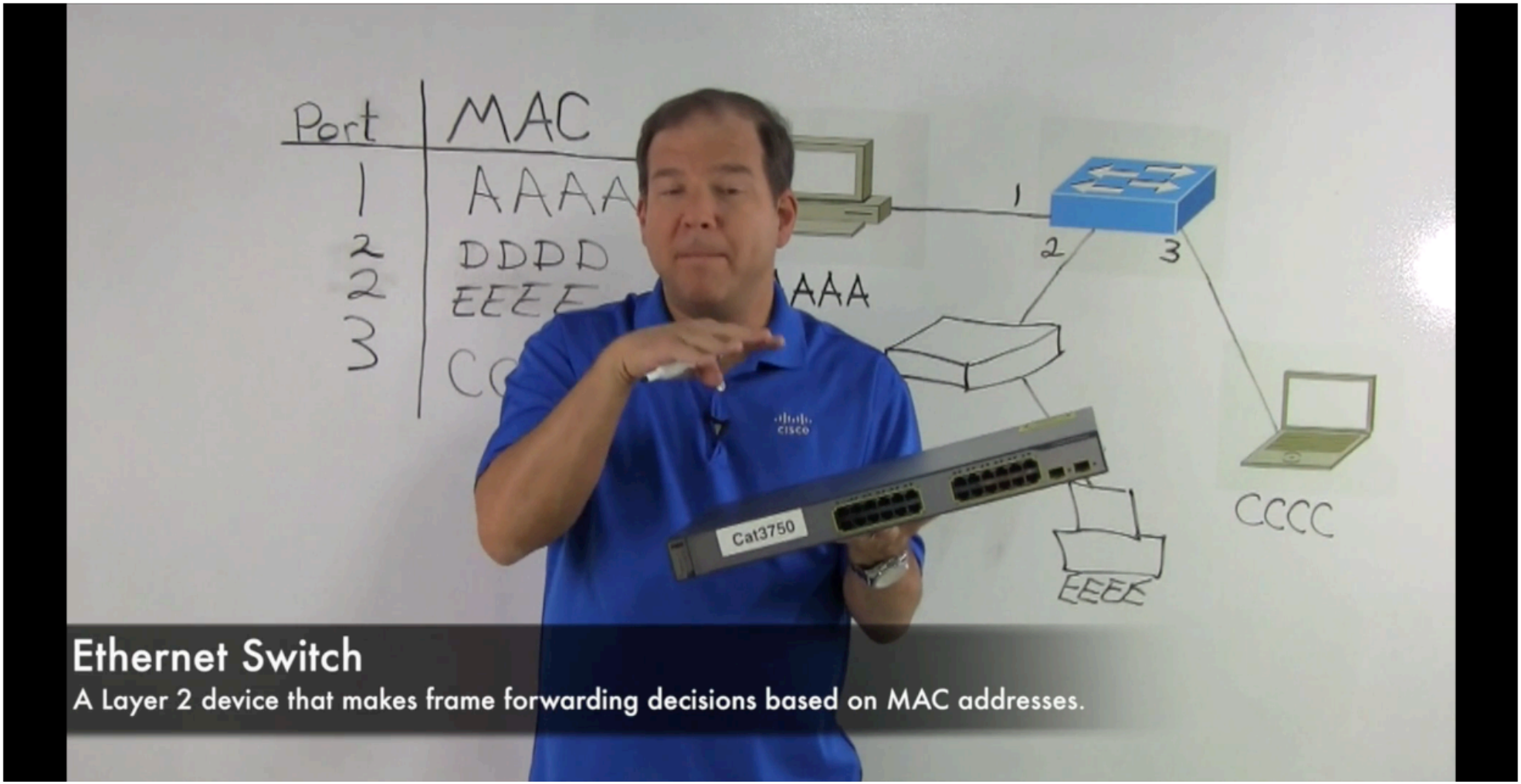

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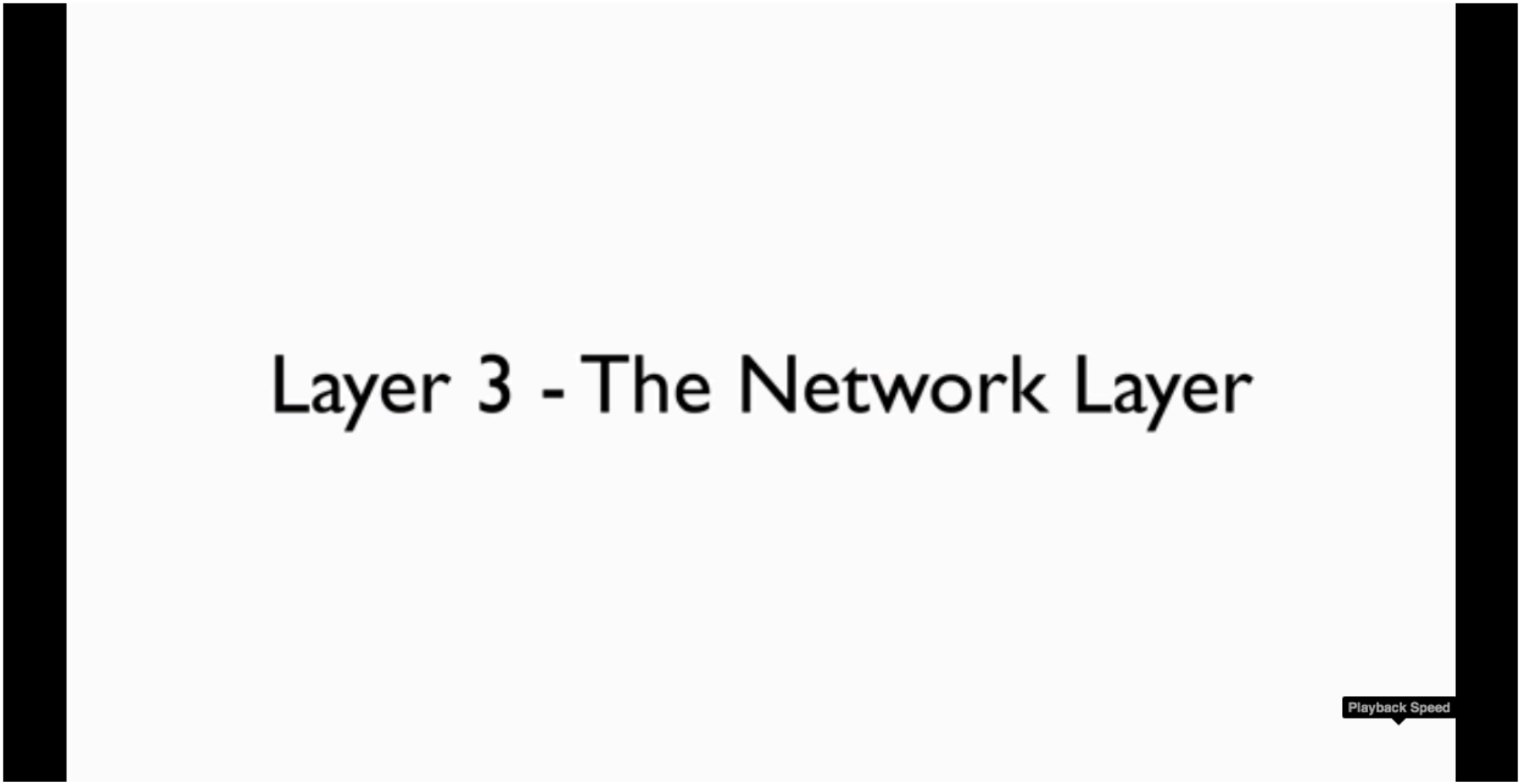
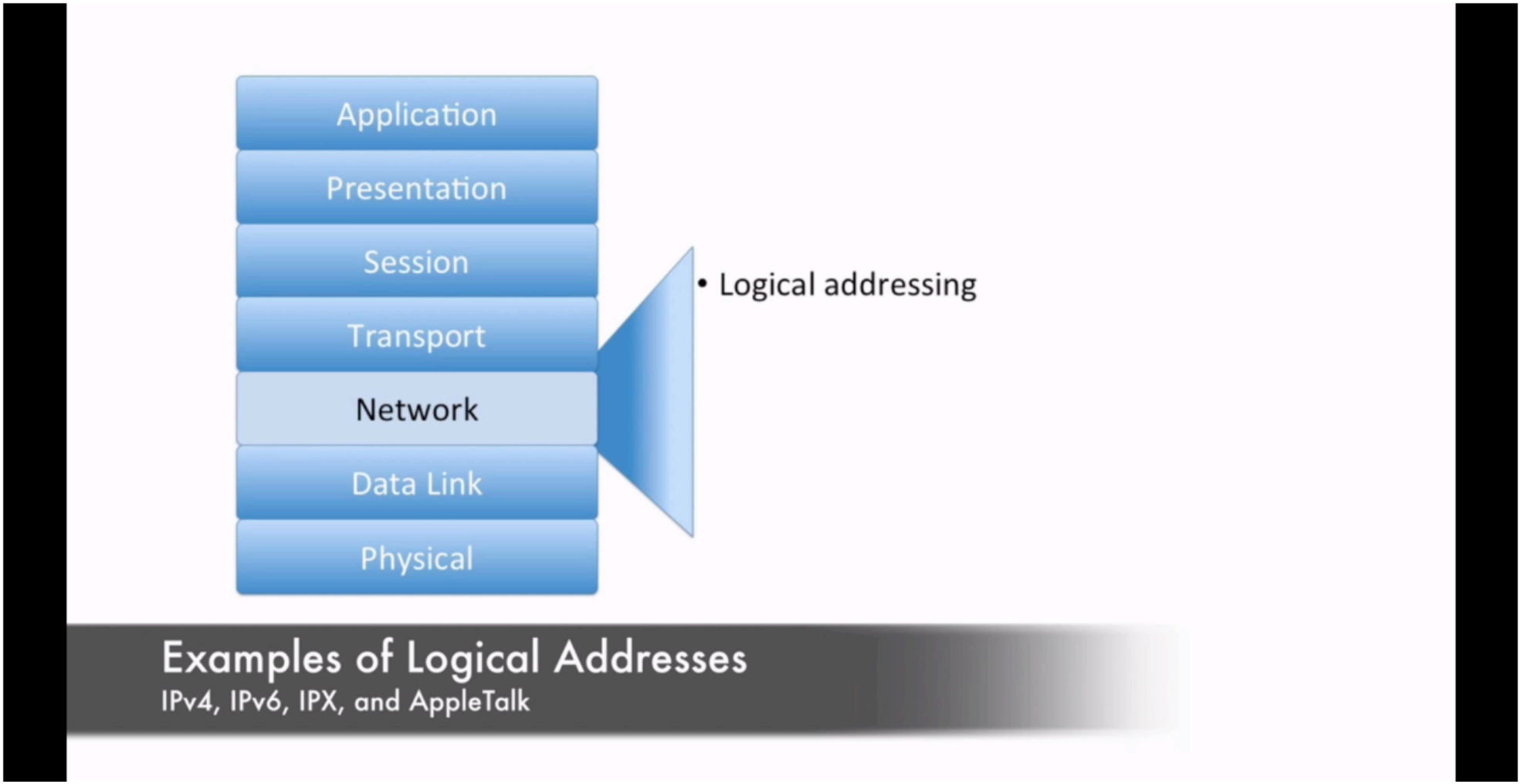
Layer 3—The Network Layer



Layer 3—The Network Layer



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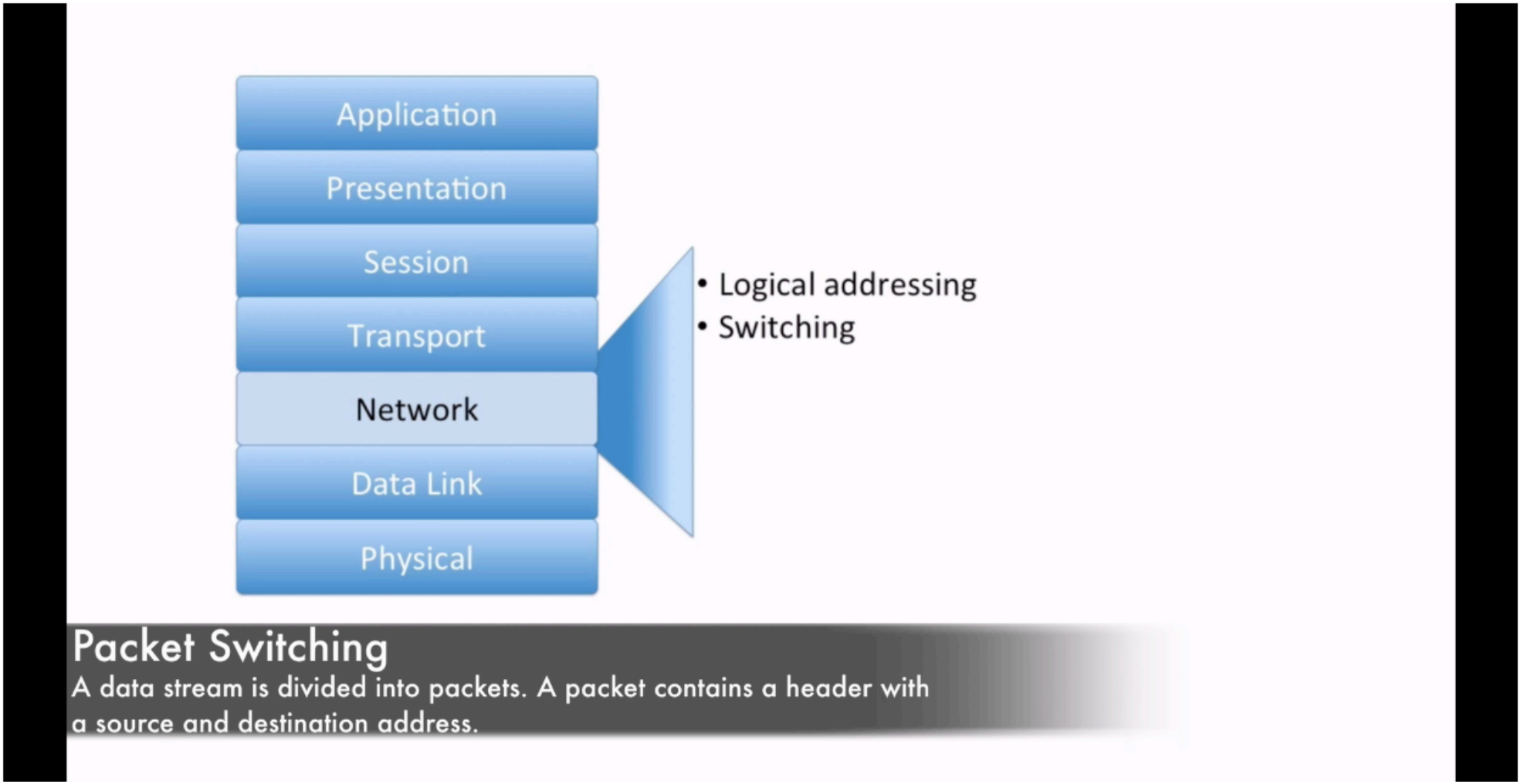

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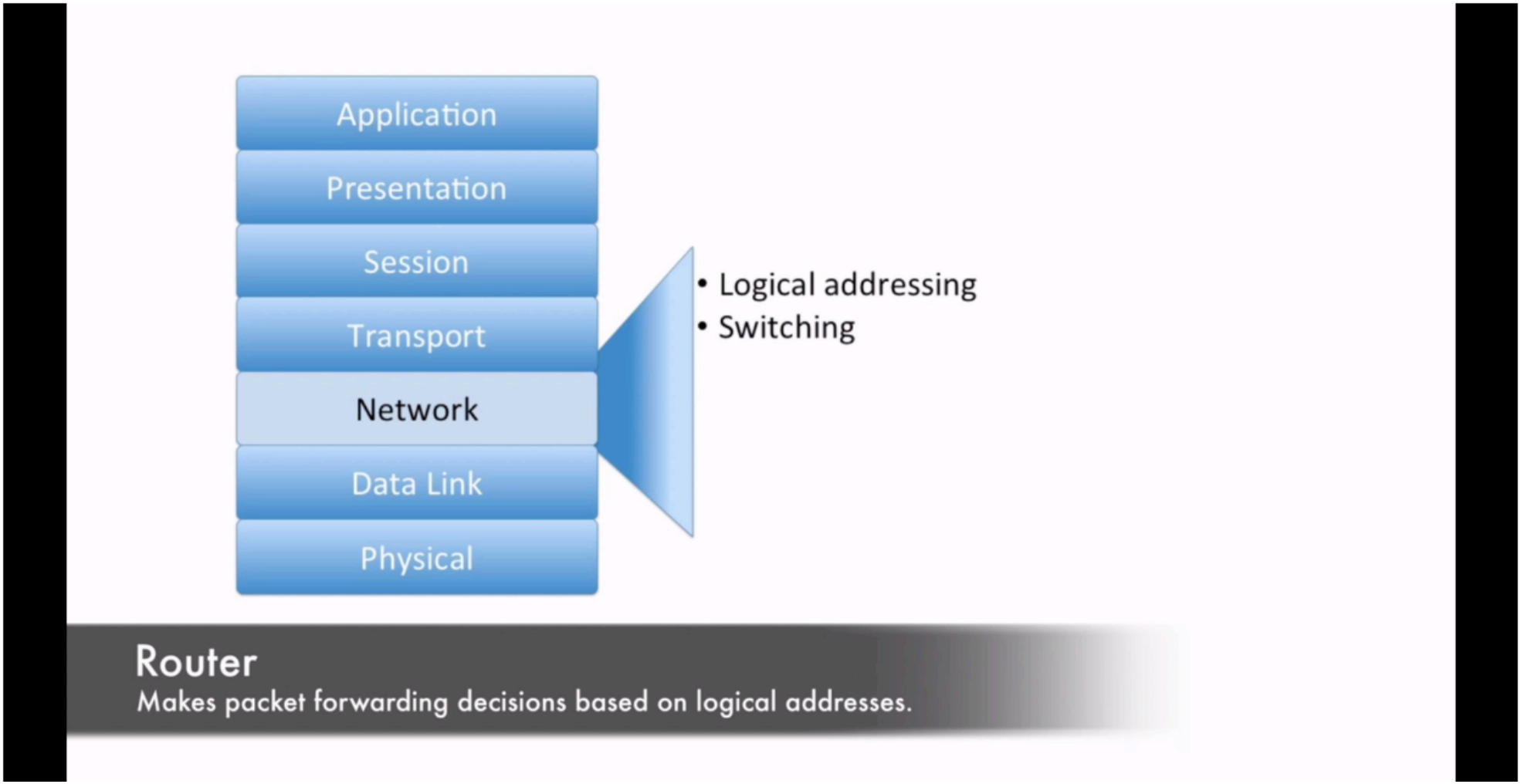
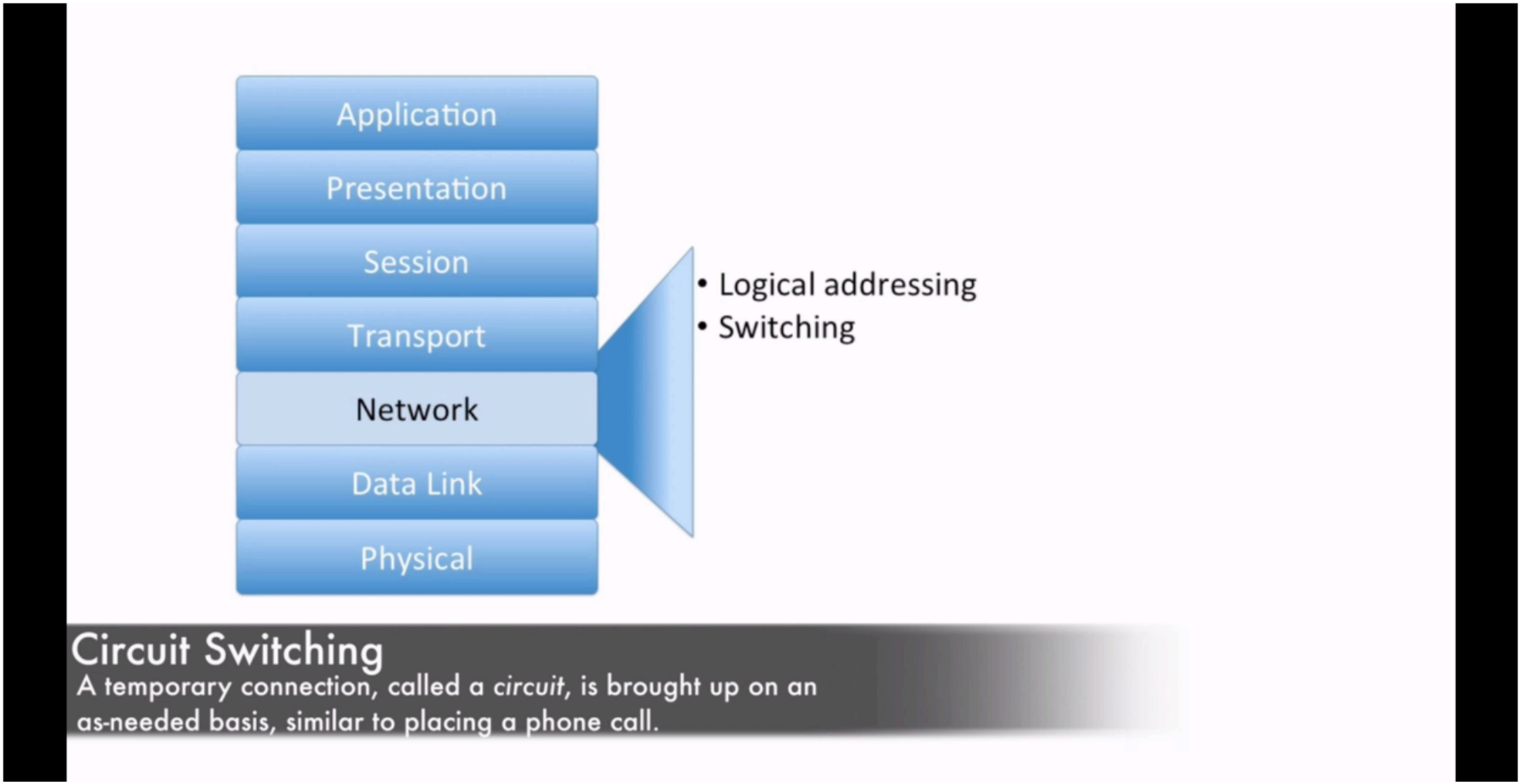
Layer 3—The Network Layer



Layer 3—The Network Layer



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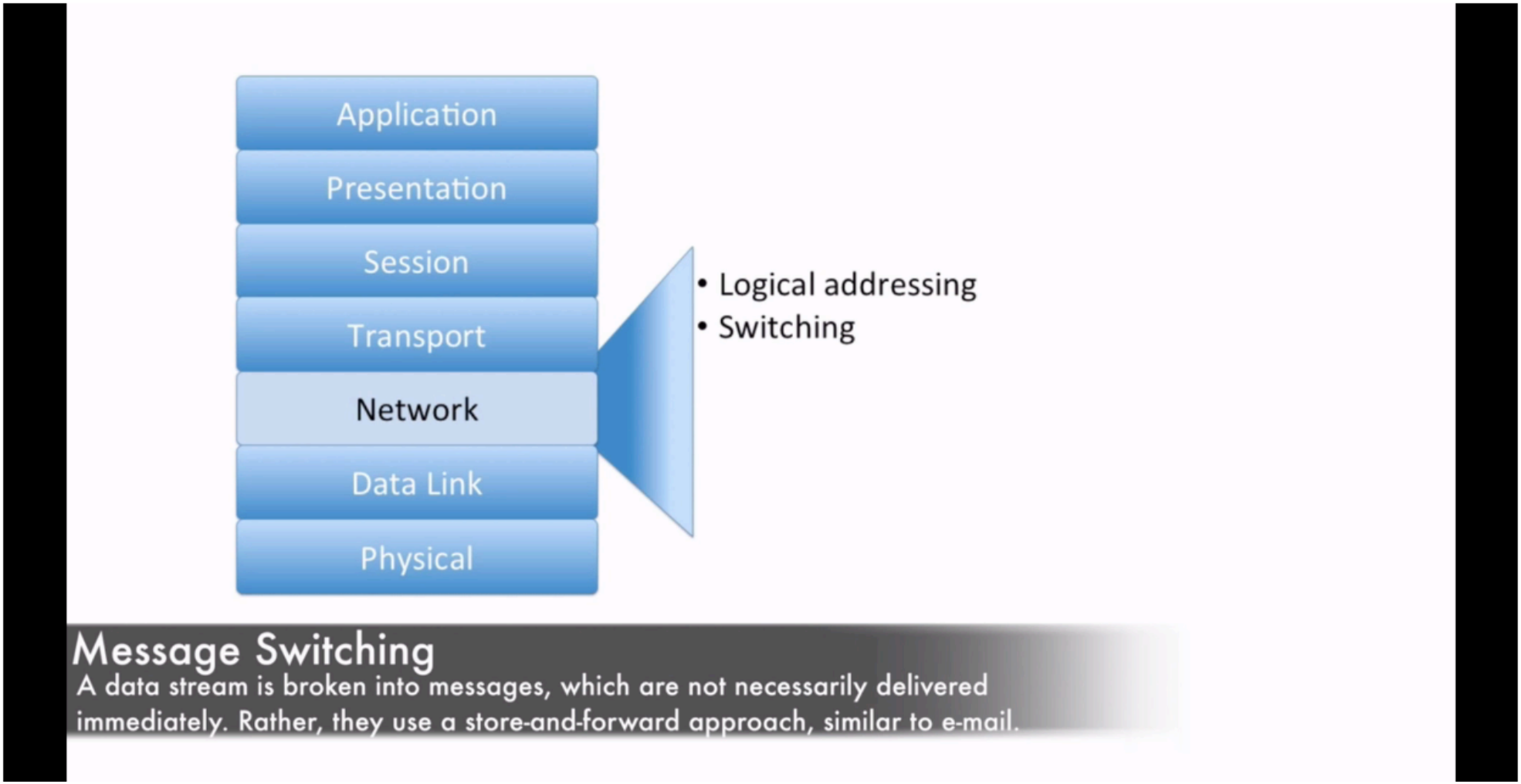

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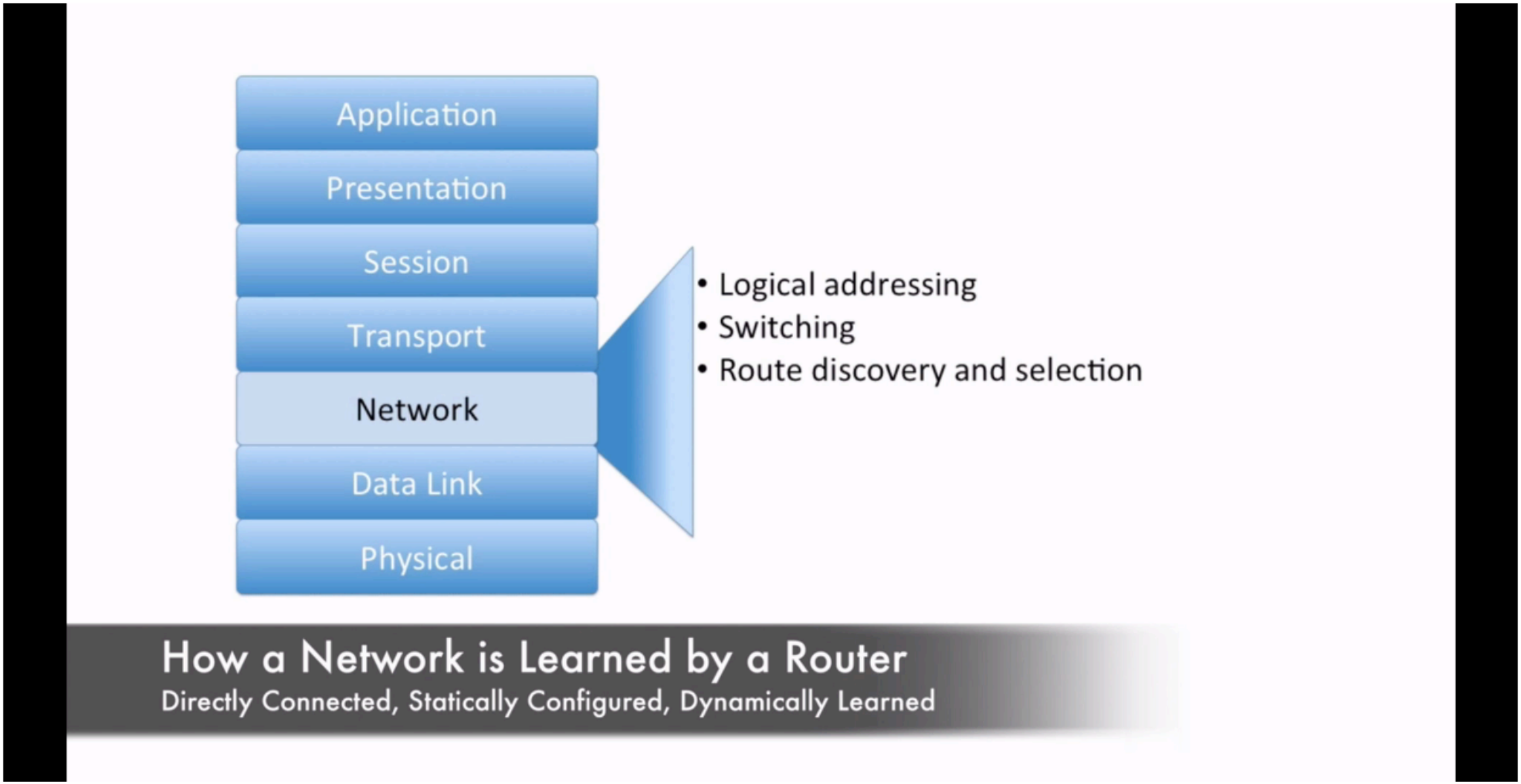

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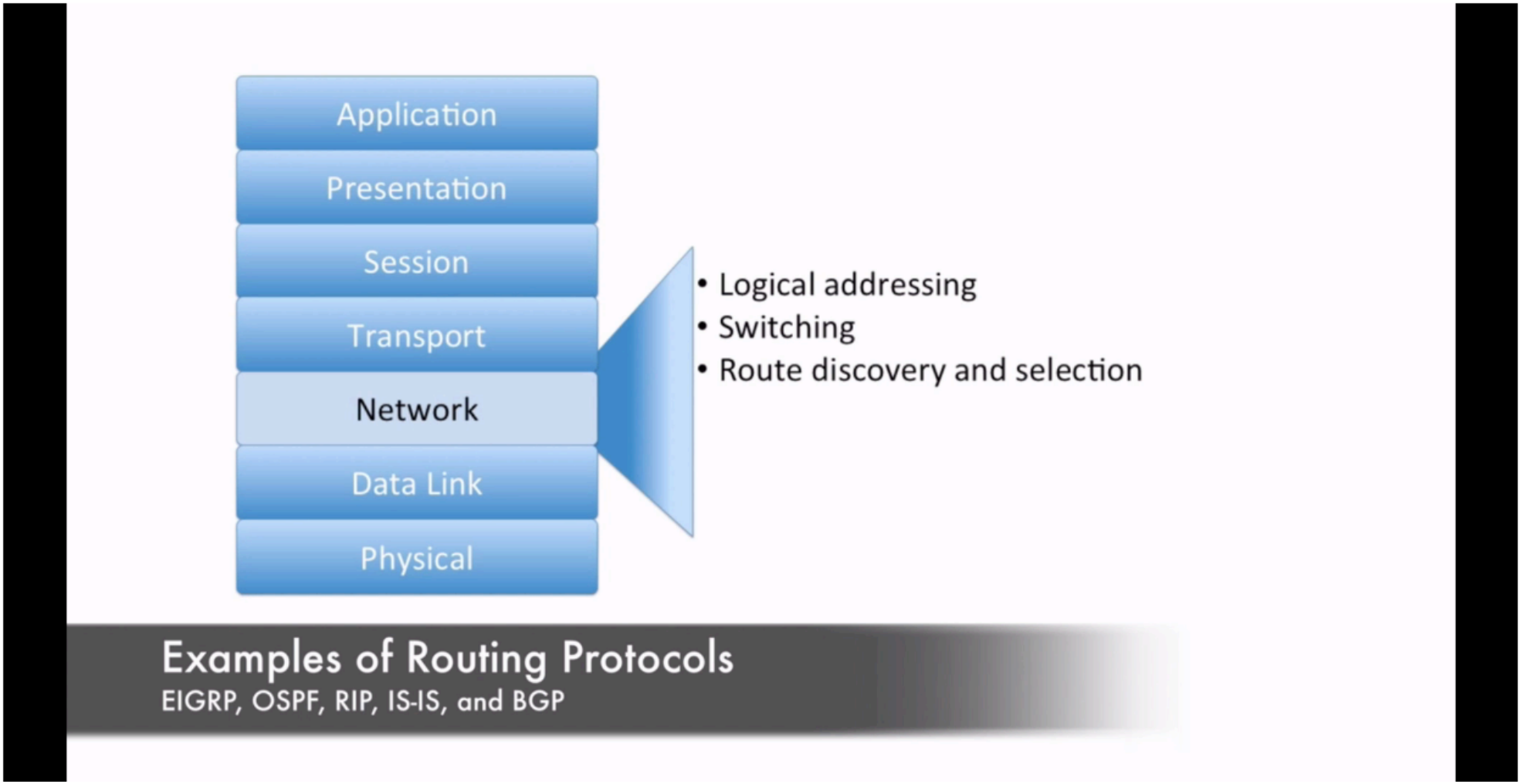
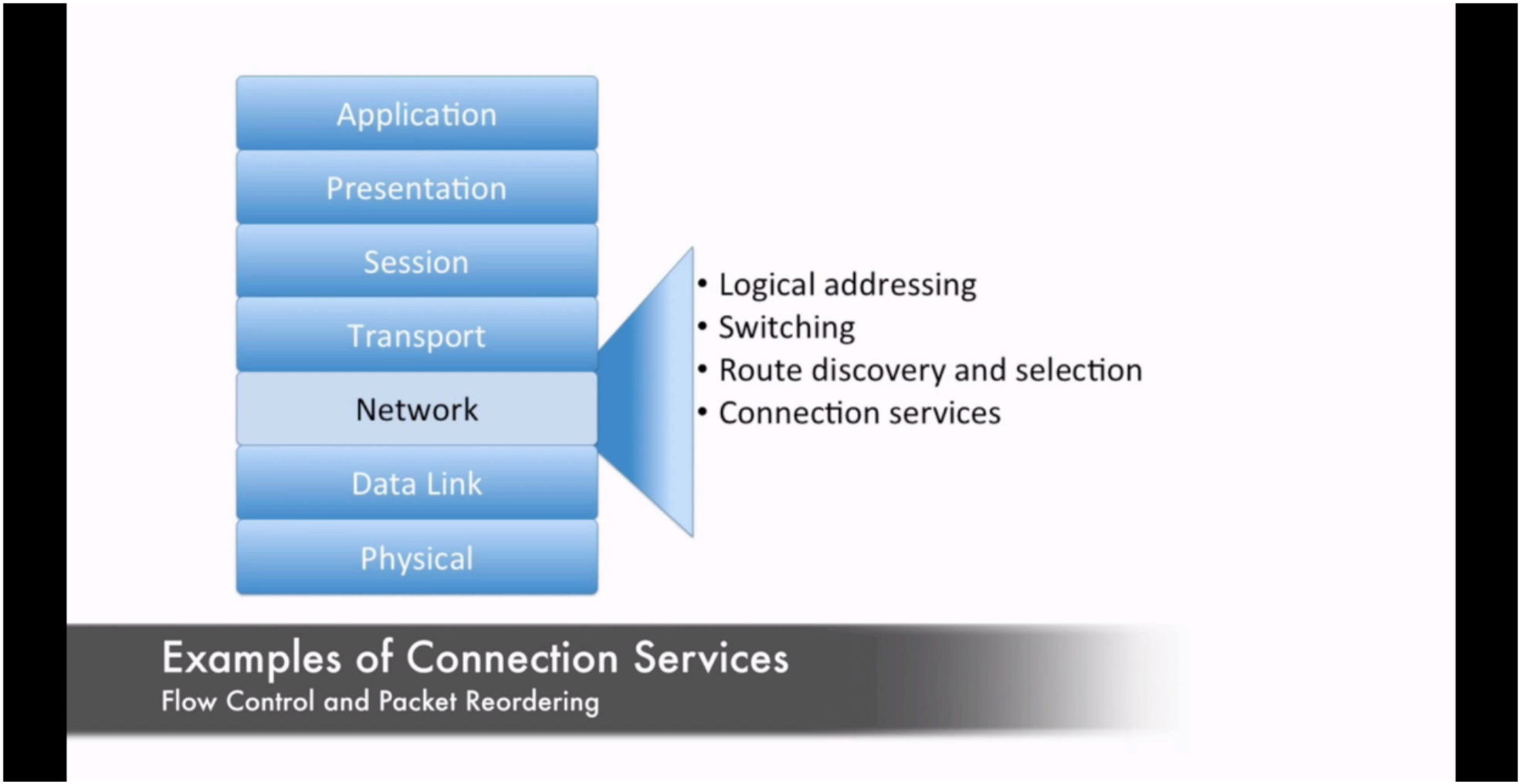


Layer 3—The Network Layer



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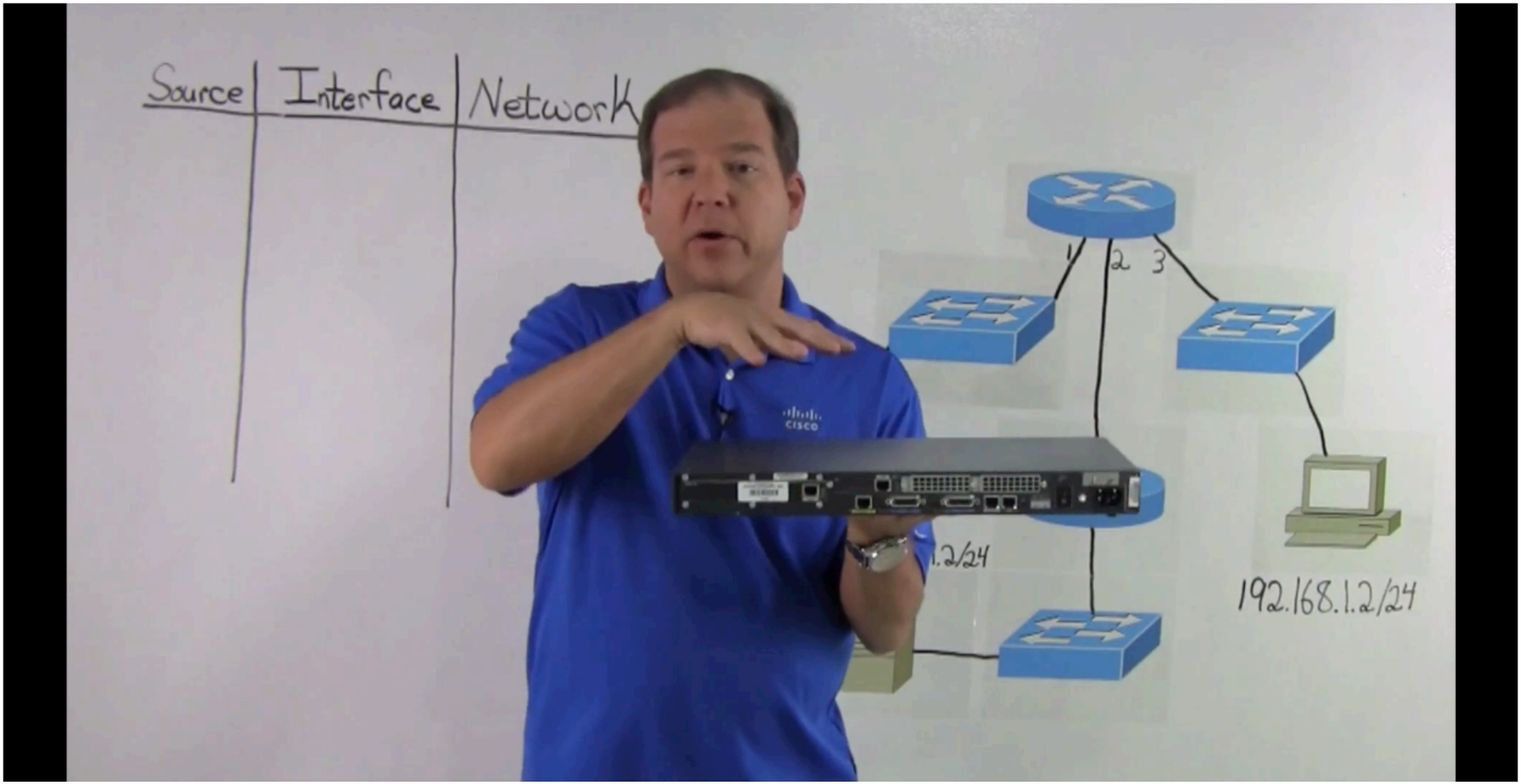

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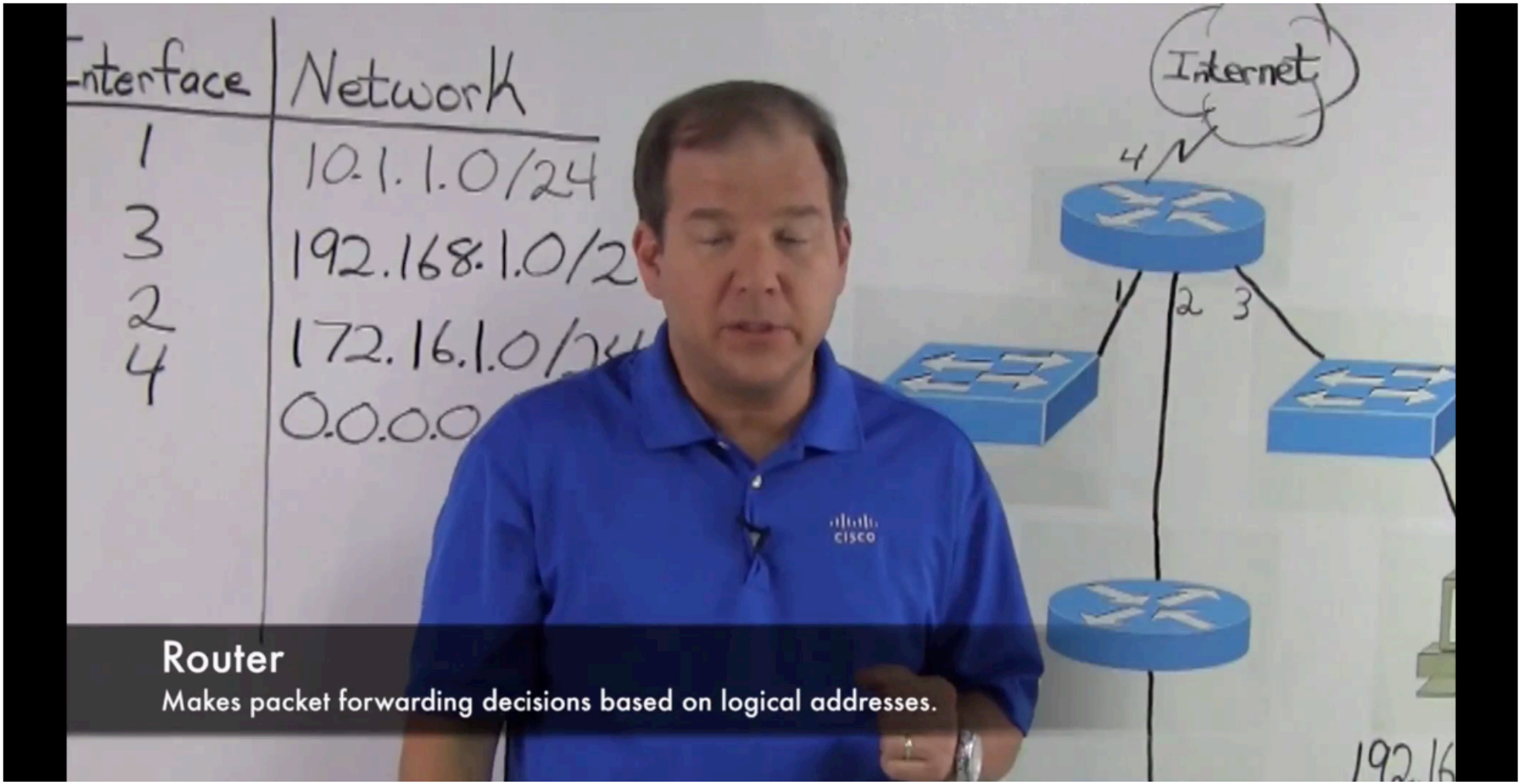
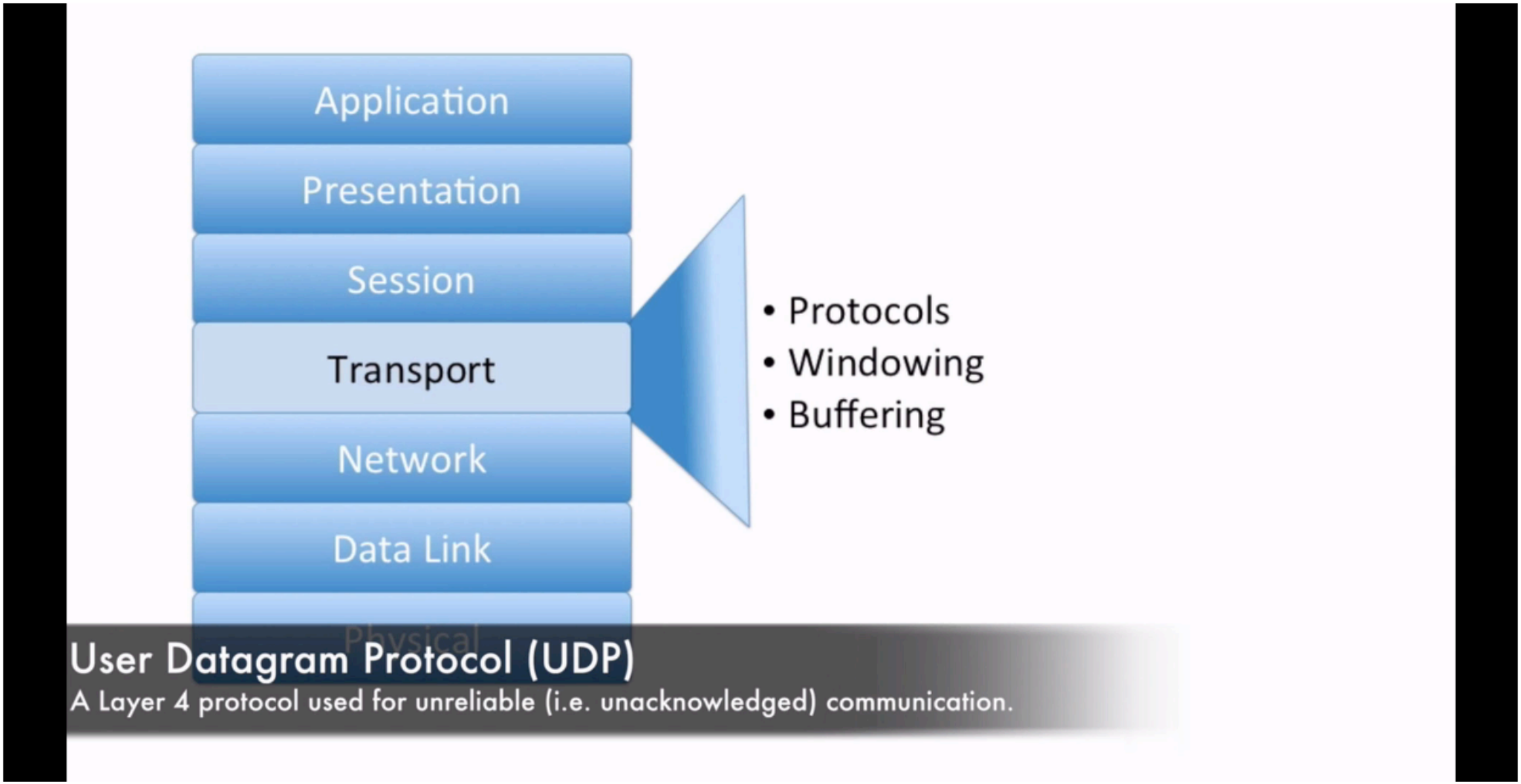


Completed

Layer 4—The Transport Layer

Completed

Layer 4—The Transport Layer



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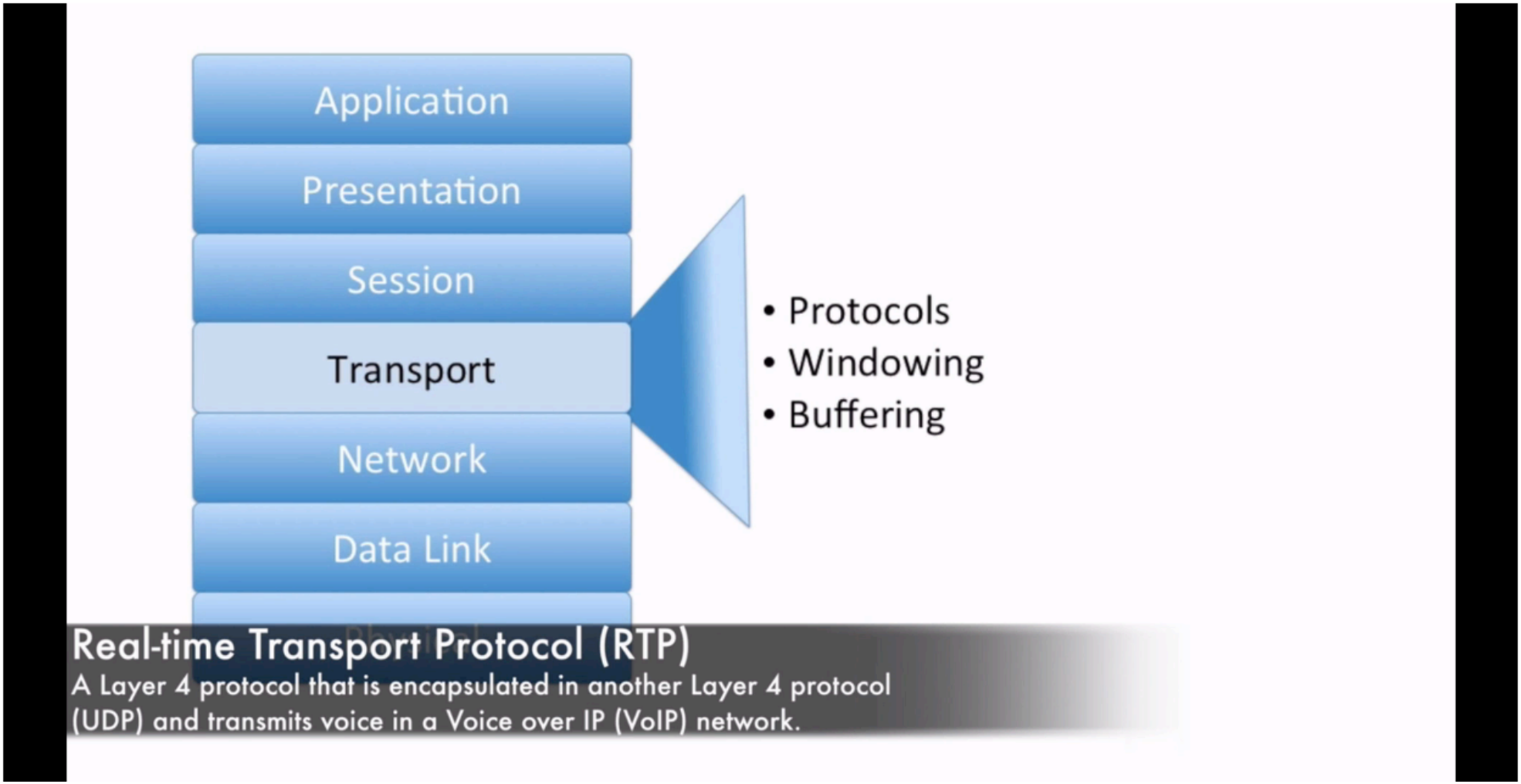

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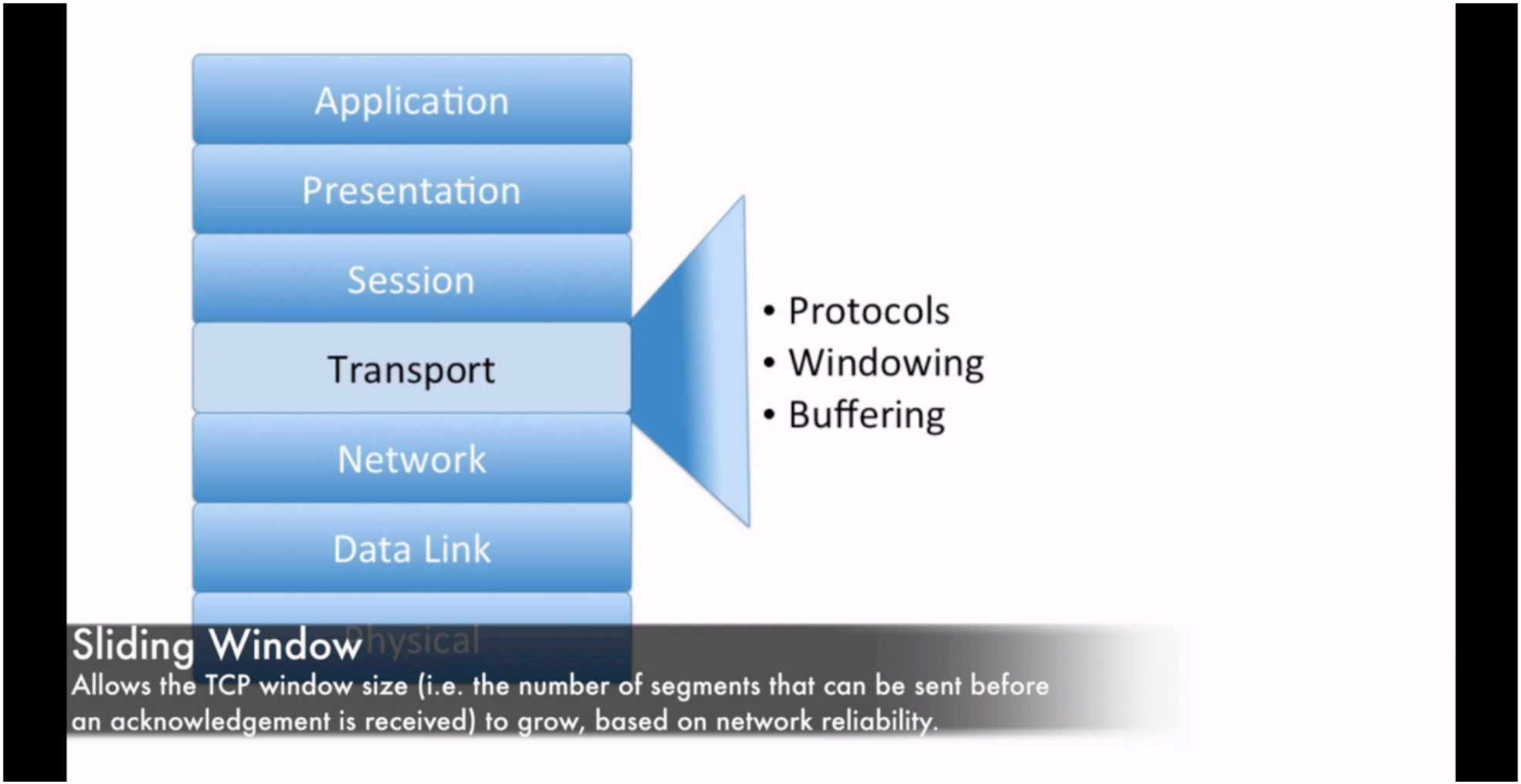

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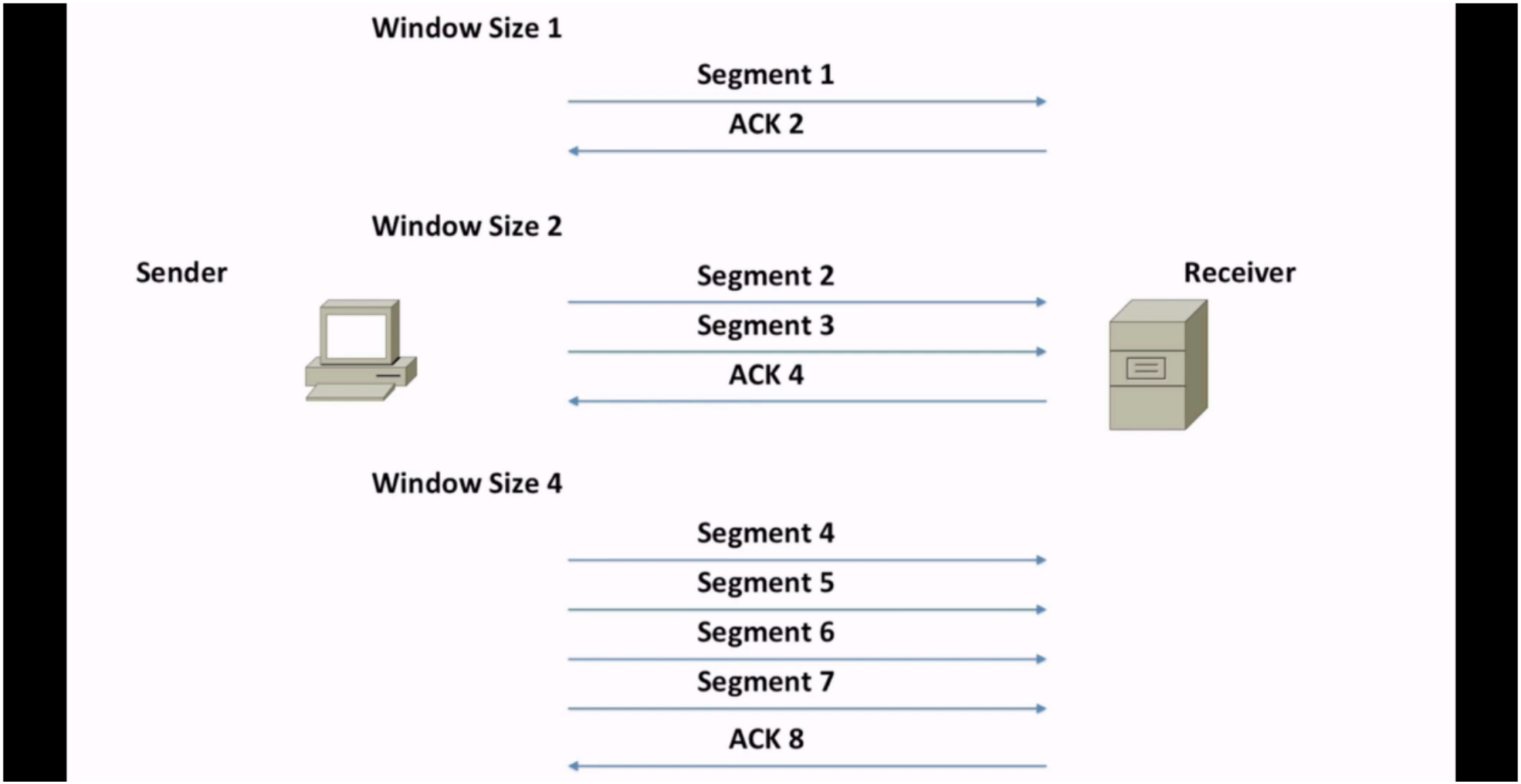

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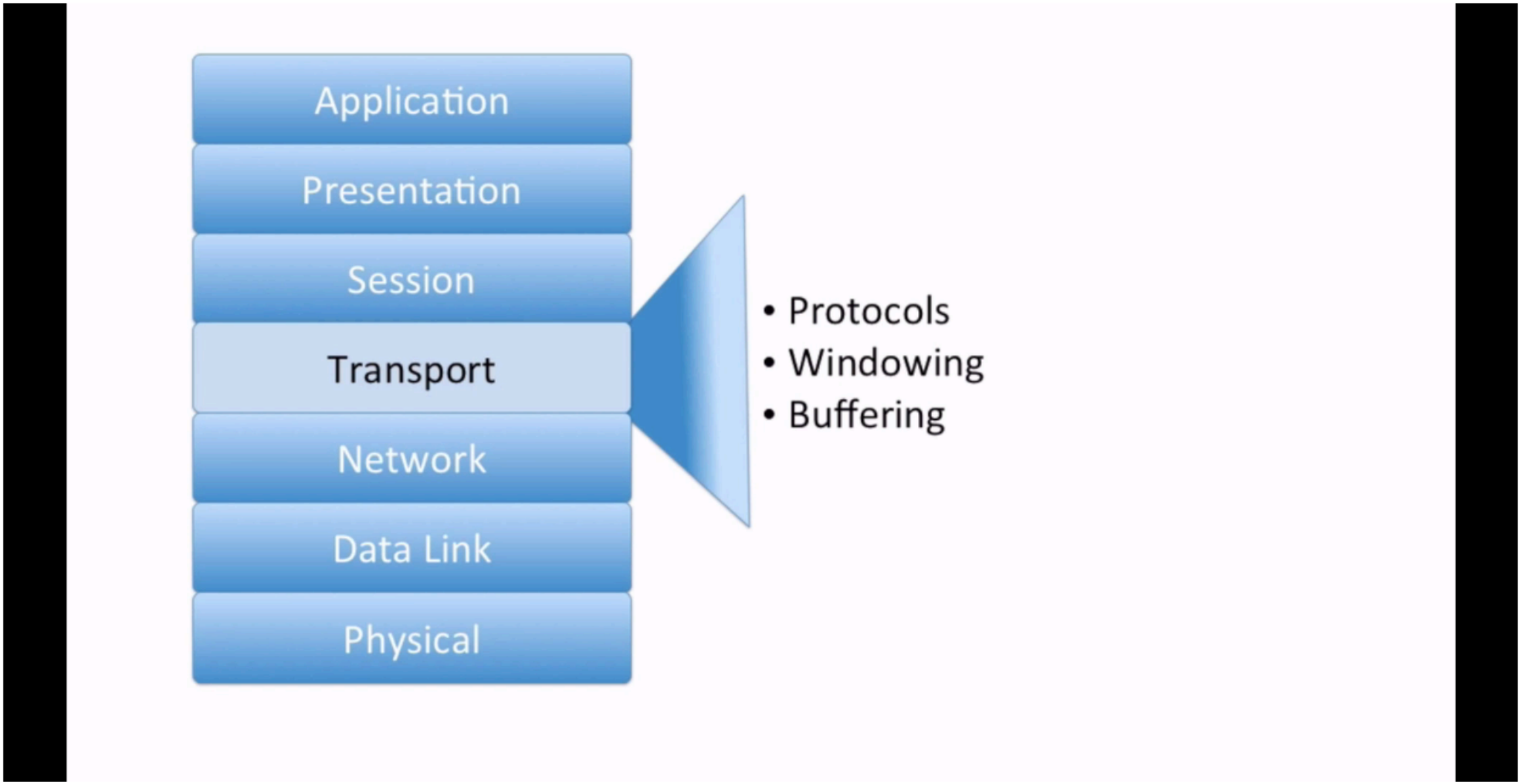

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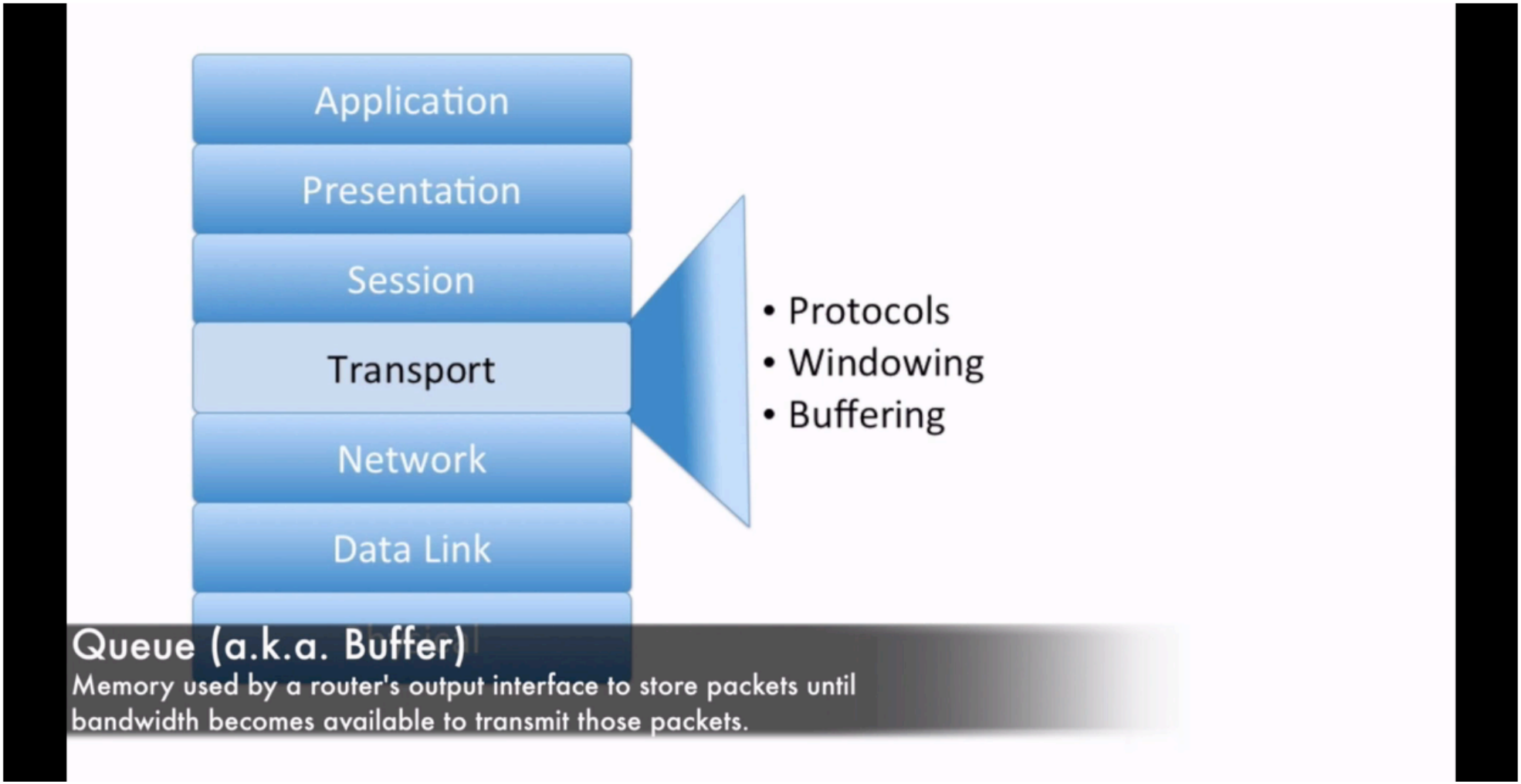

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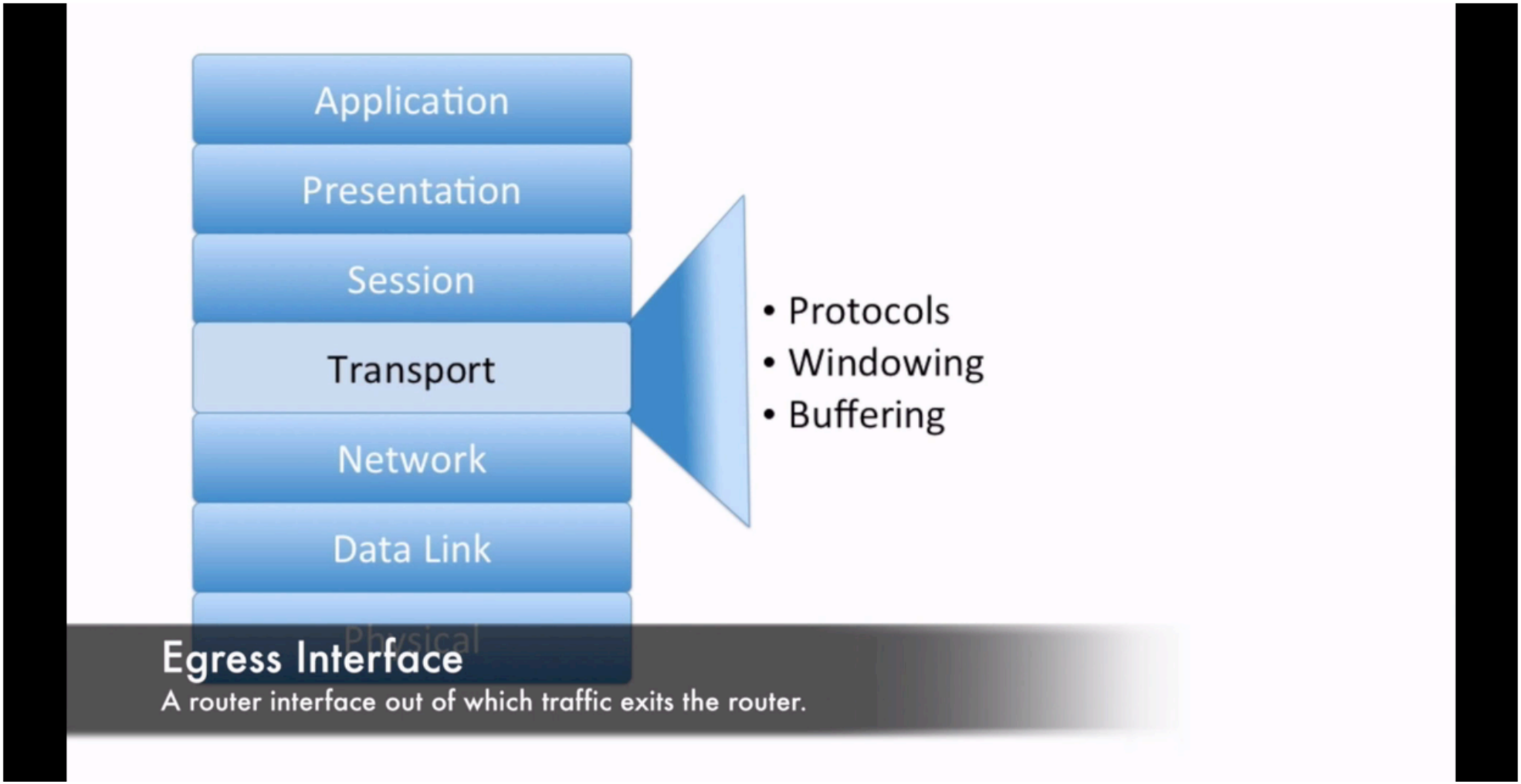

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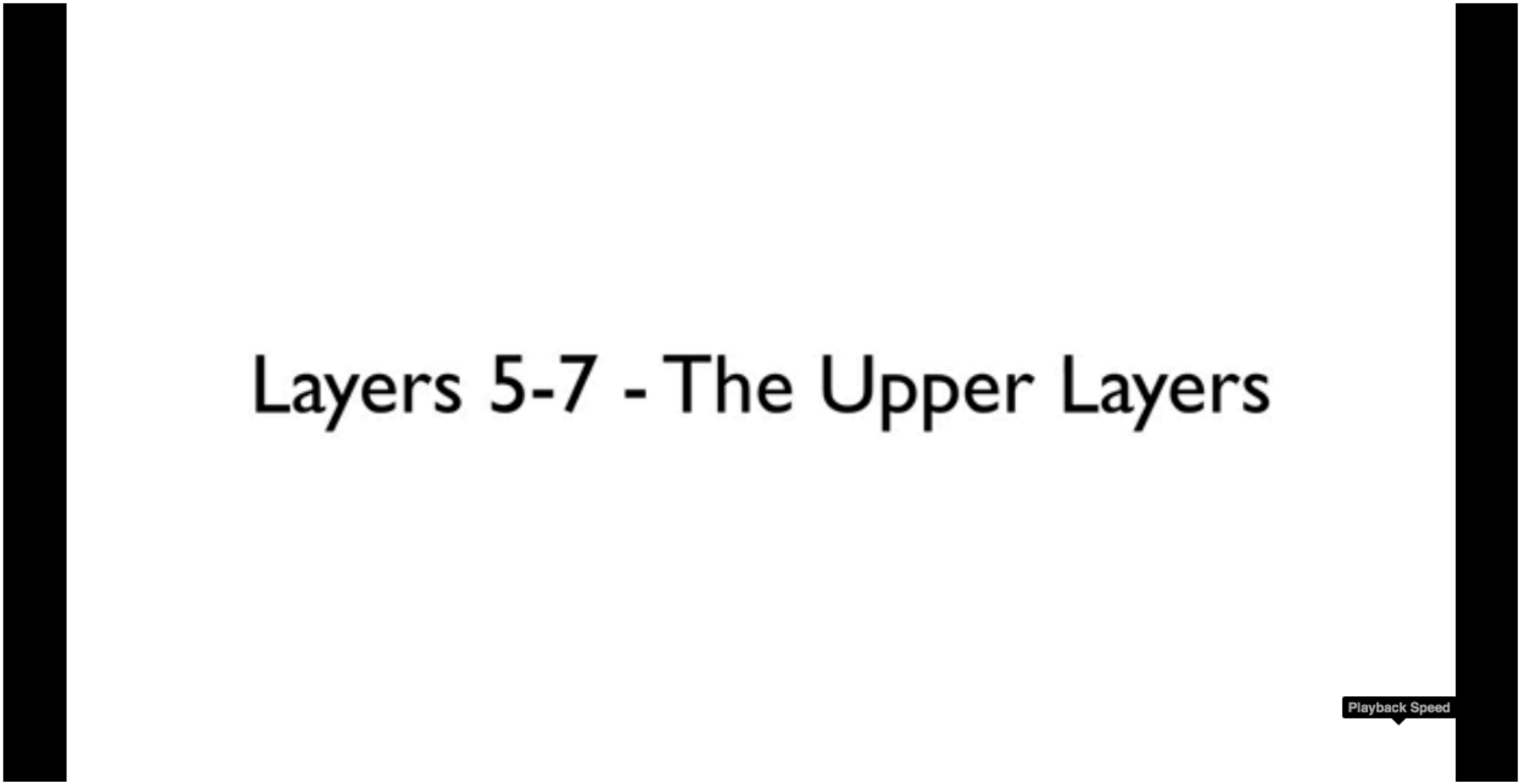
Layers 5-7—The Upper Layers



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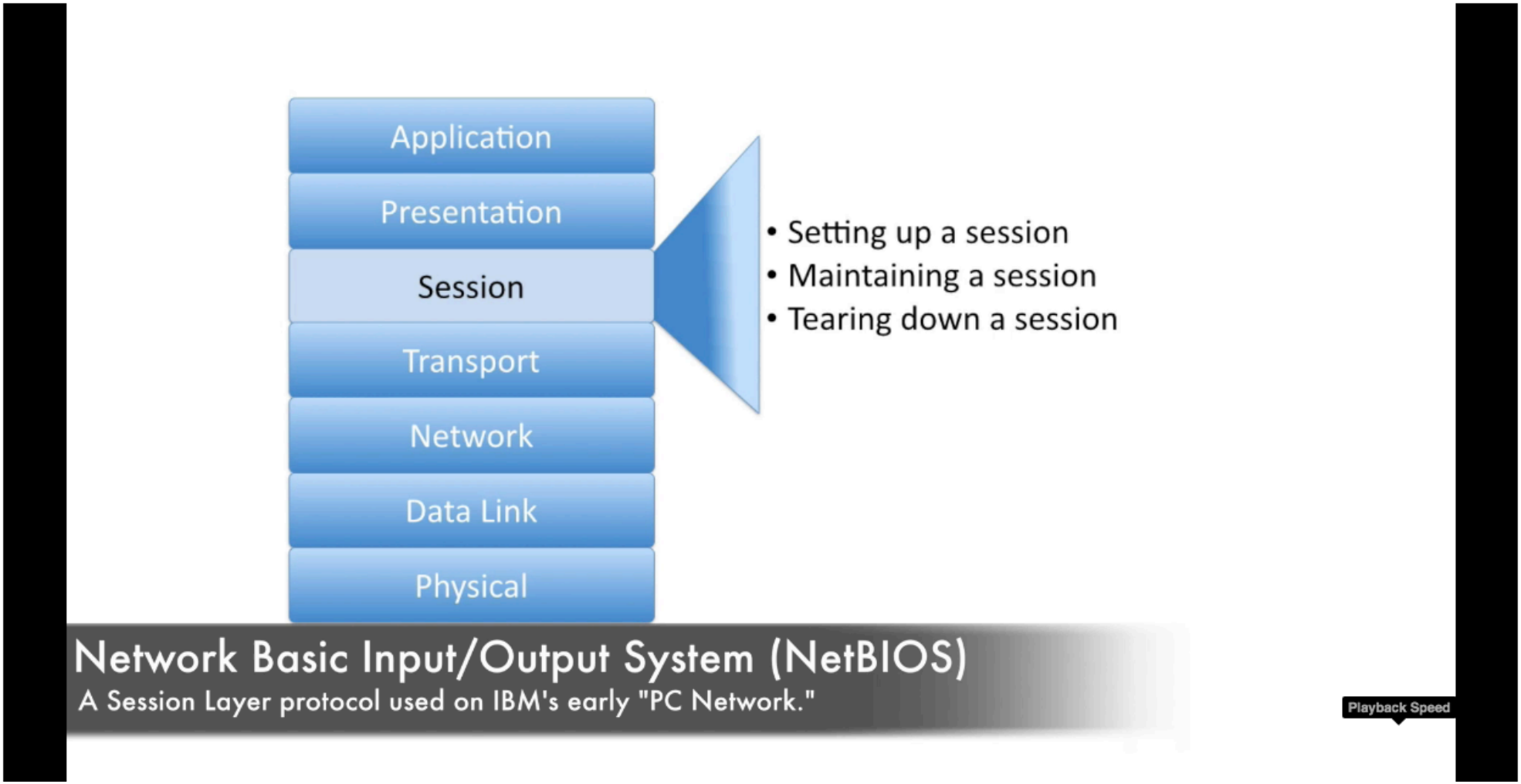
Layers 5-7—The Upper Layers



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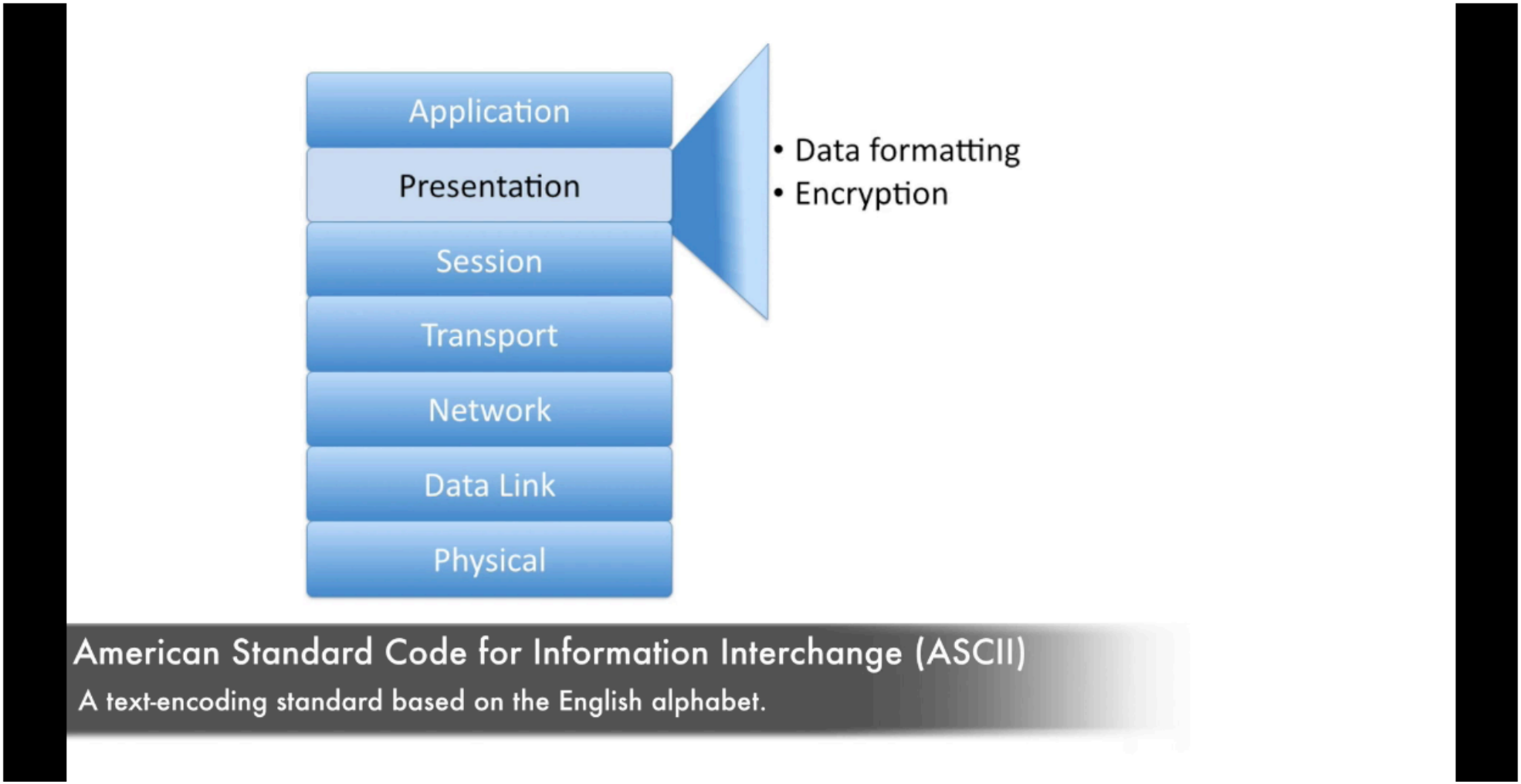

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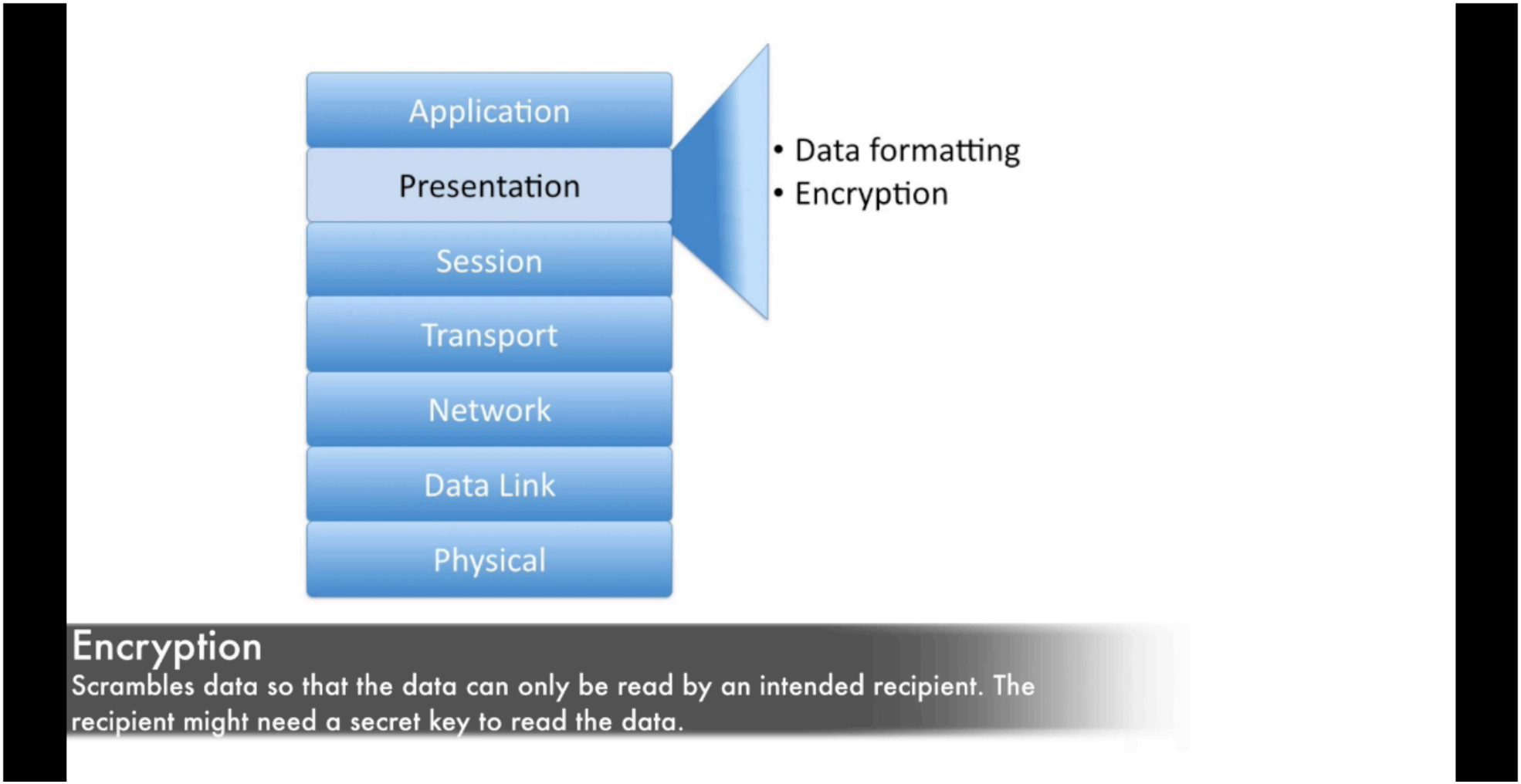

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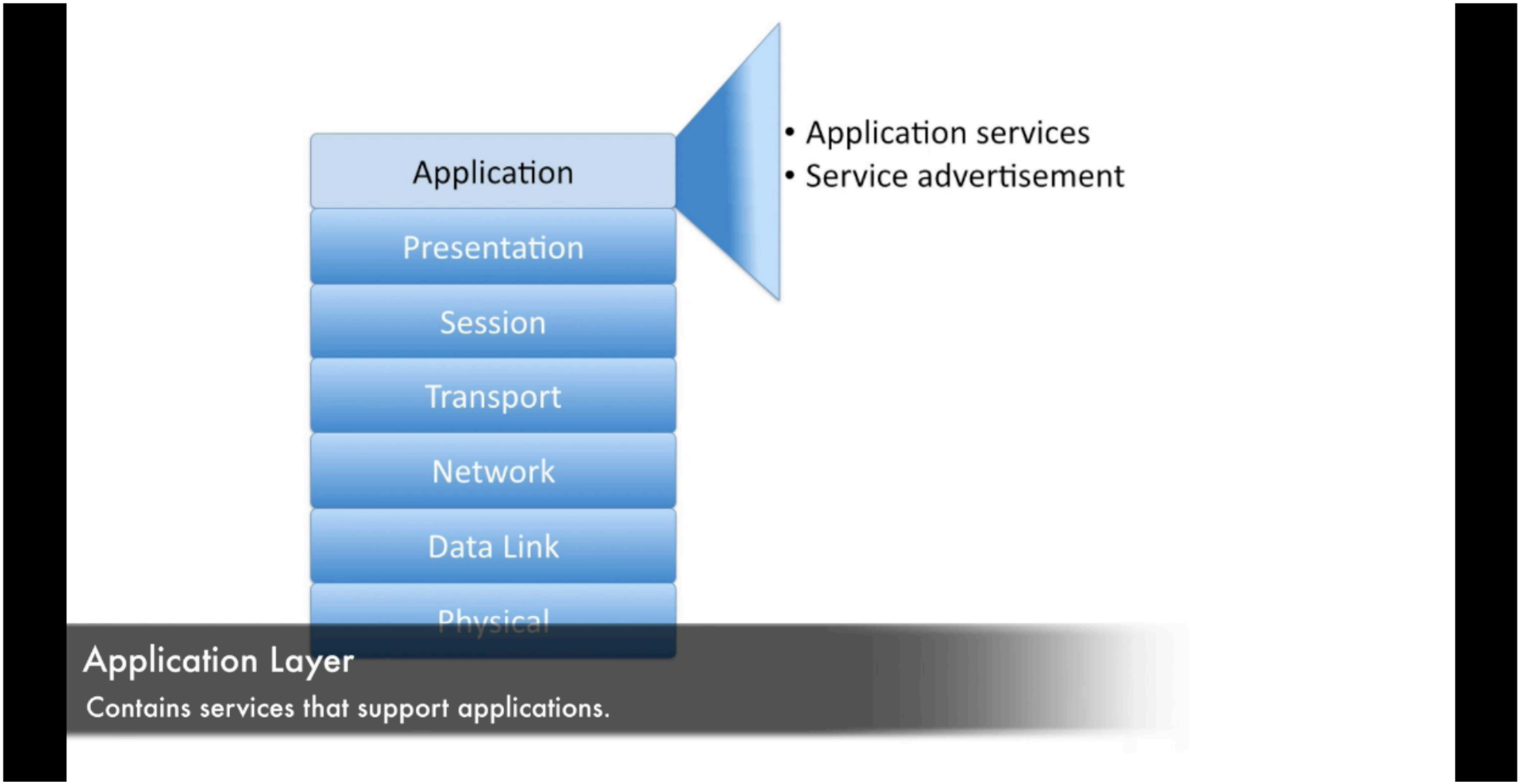
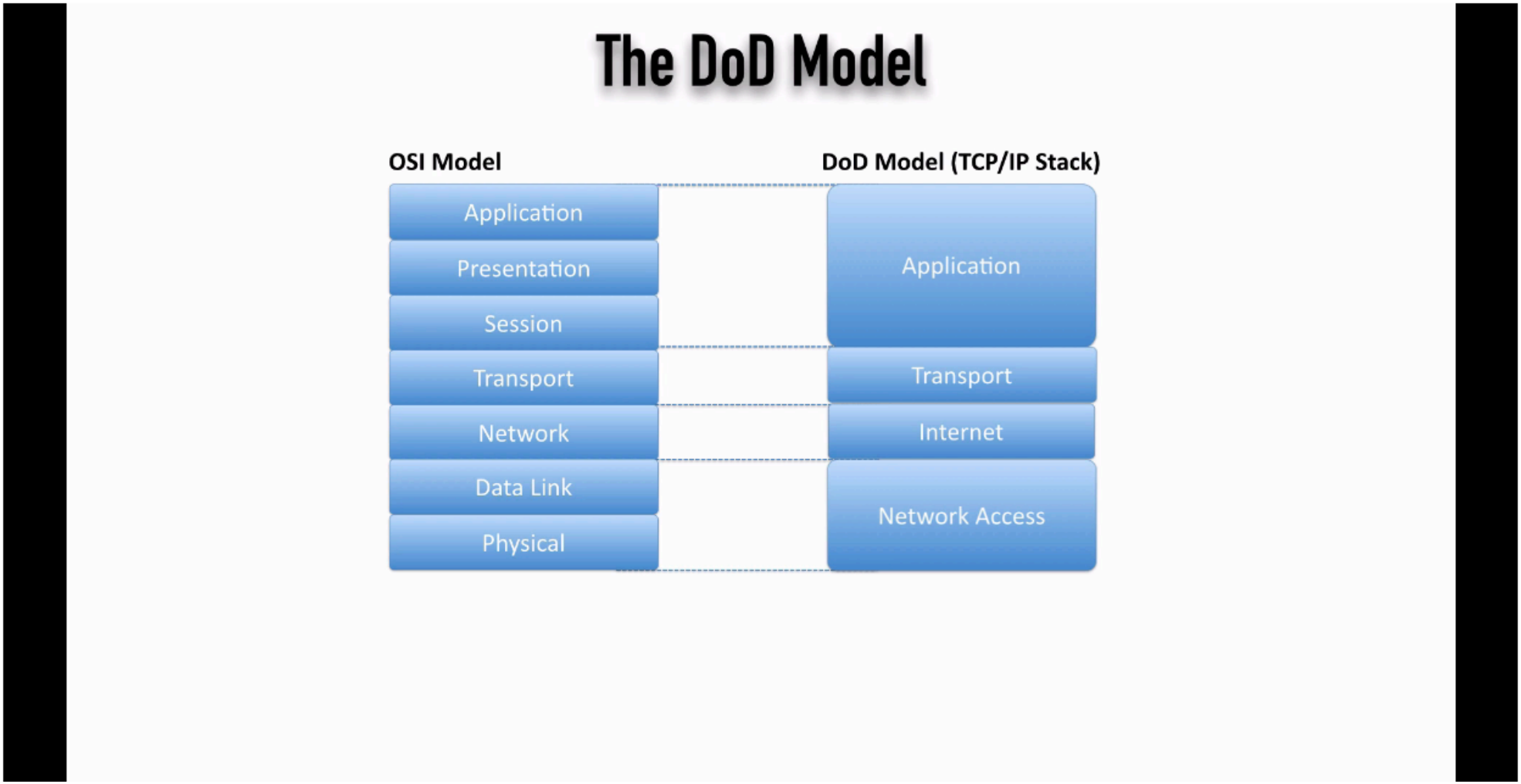


The DoD Model

Completed

The DoD Model



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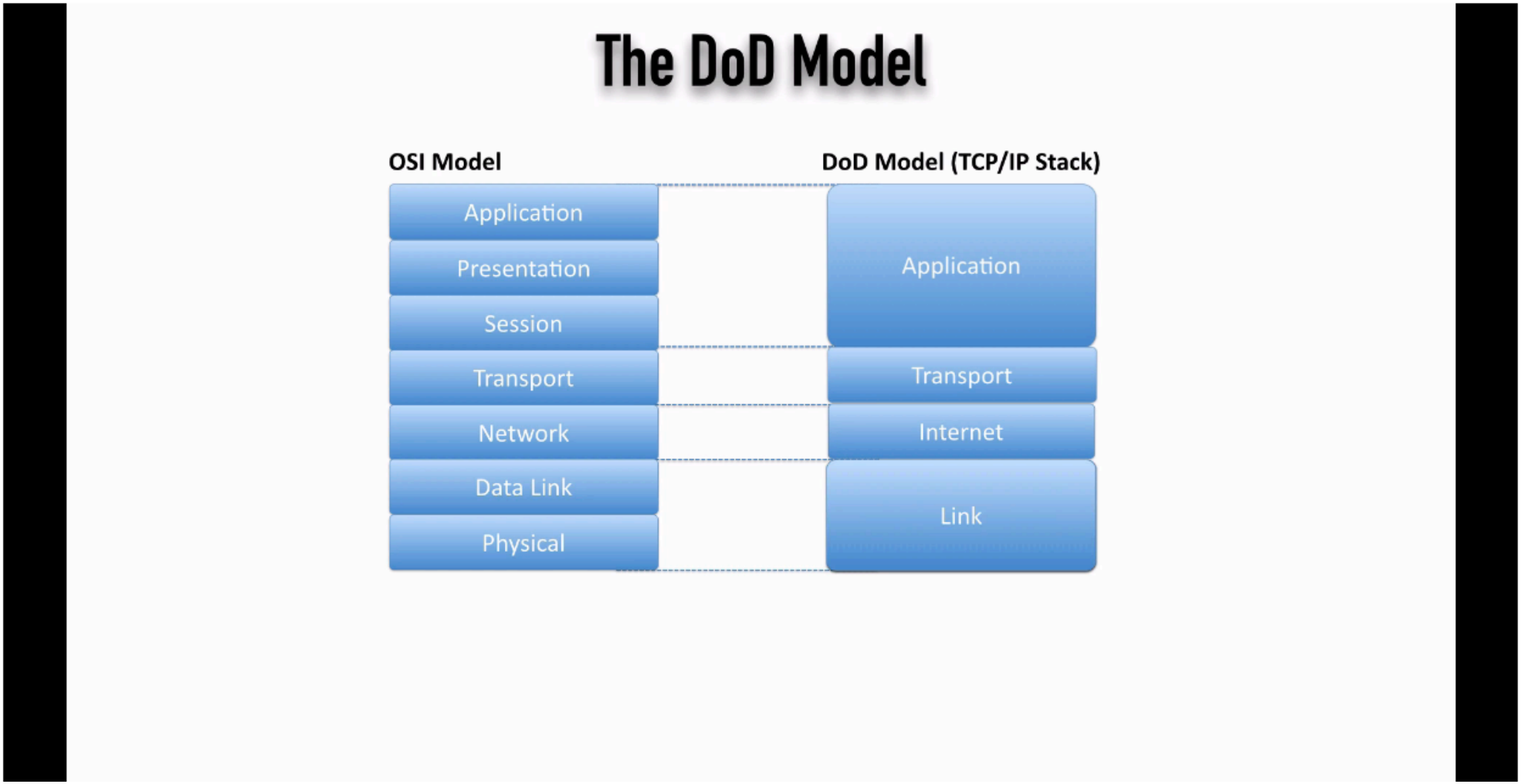
The DoD Model



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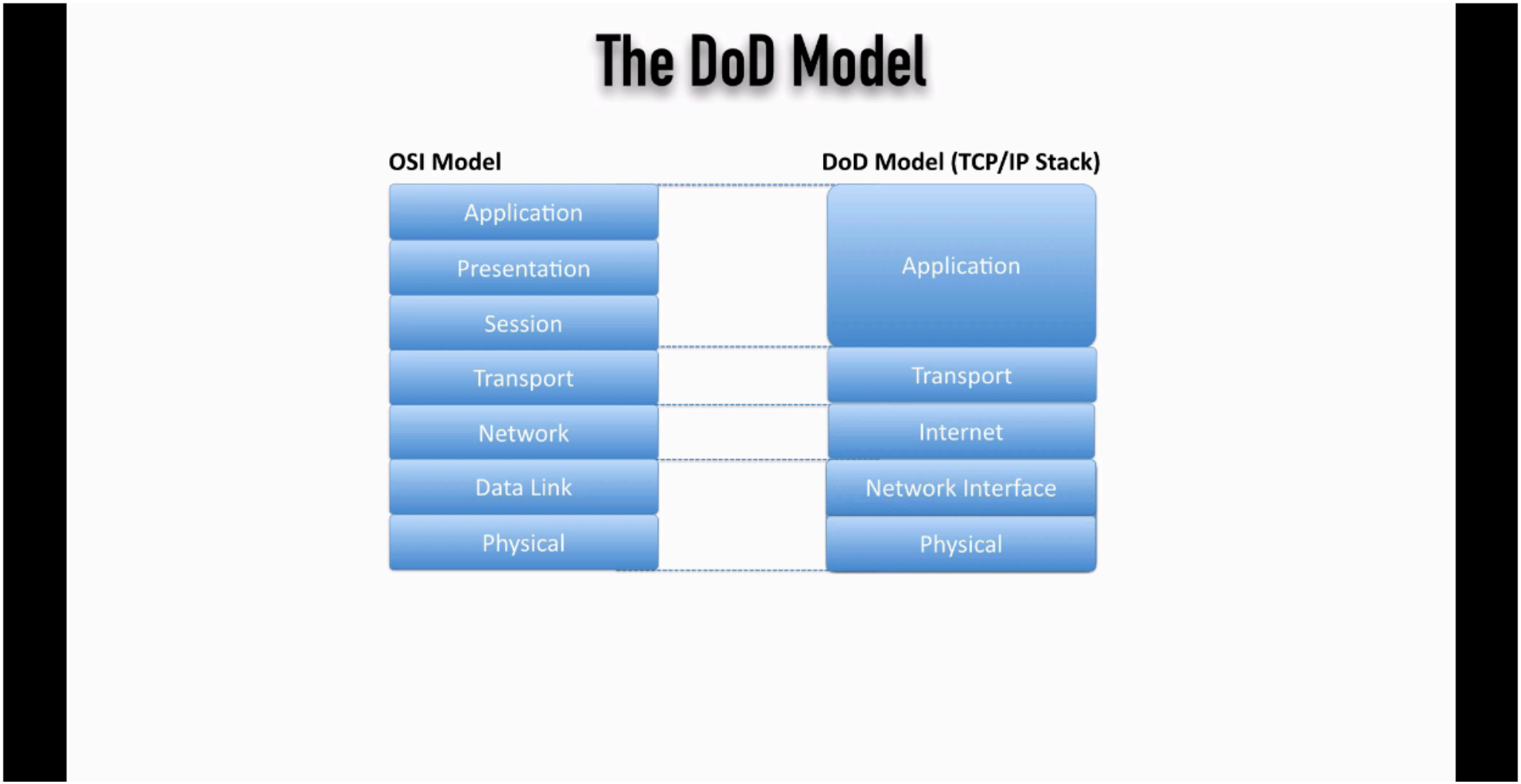
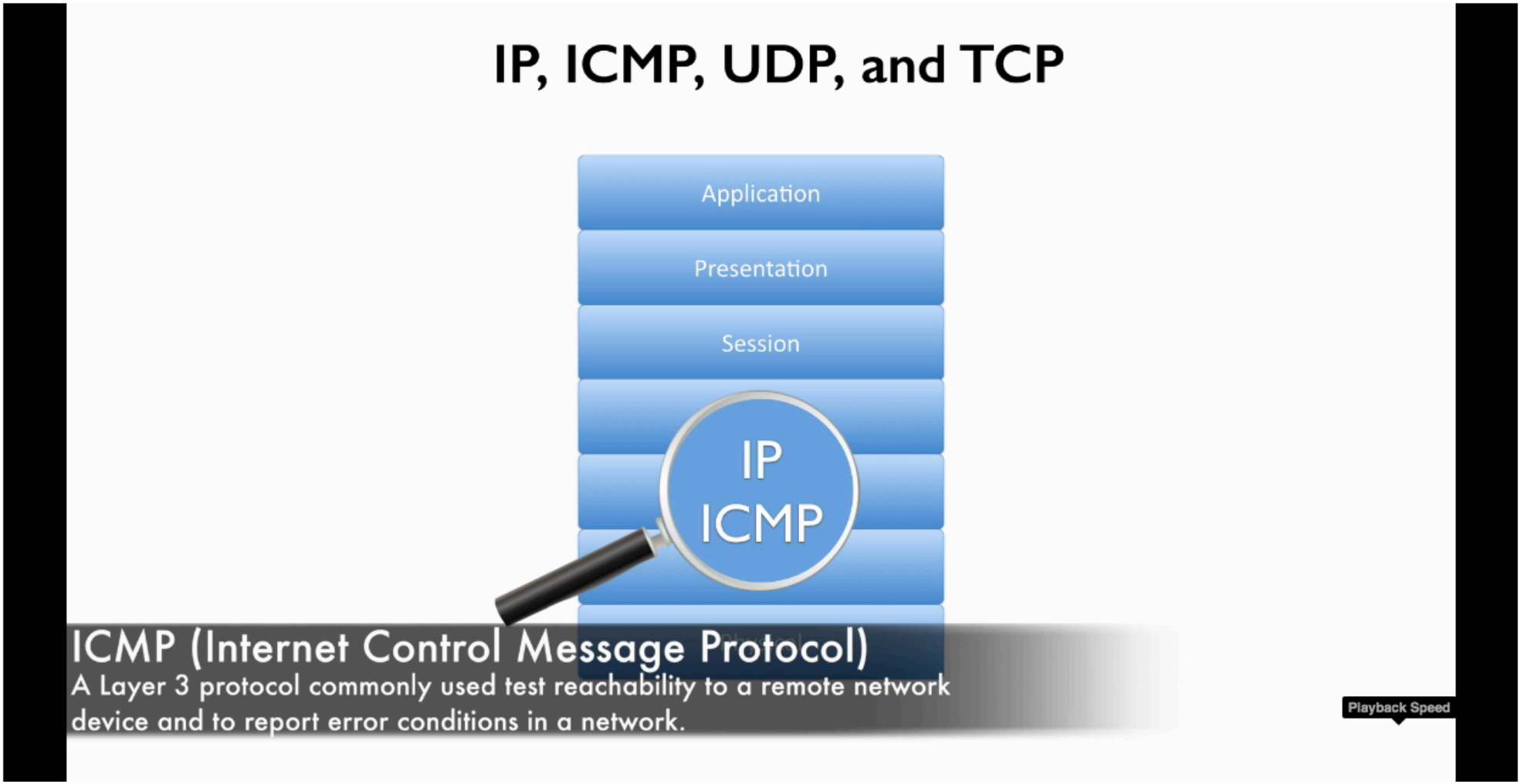
The DoD Model



Completed

IP, ICMP, UDP, and TCP

IP, ICMP, UDP, and TCP



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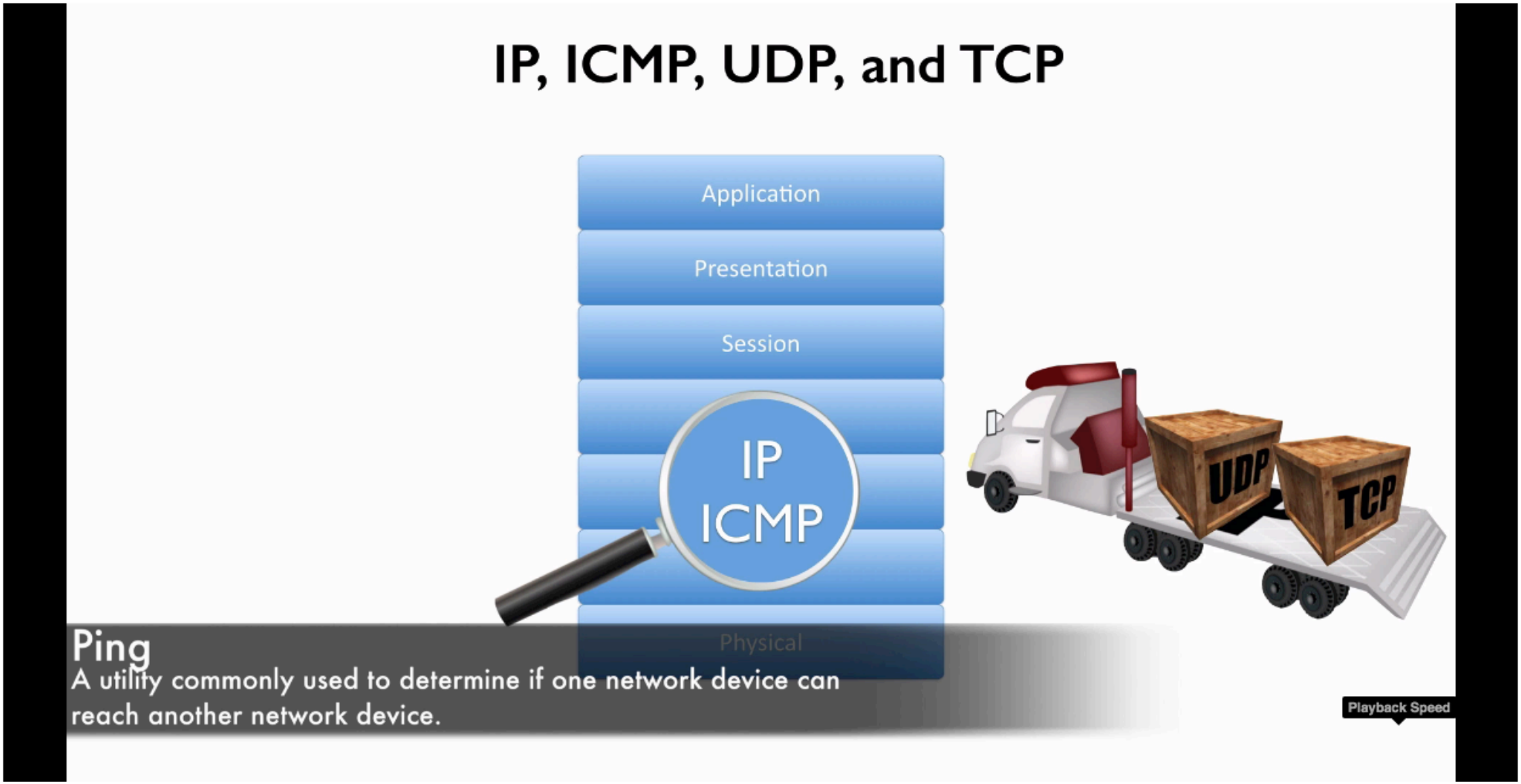

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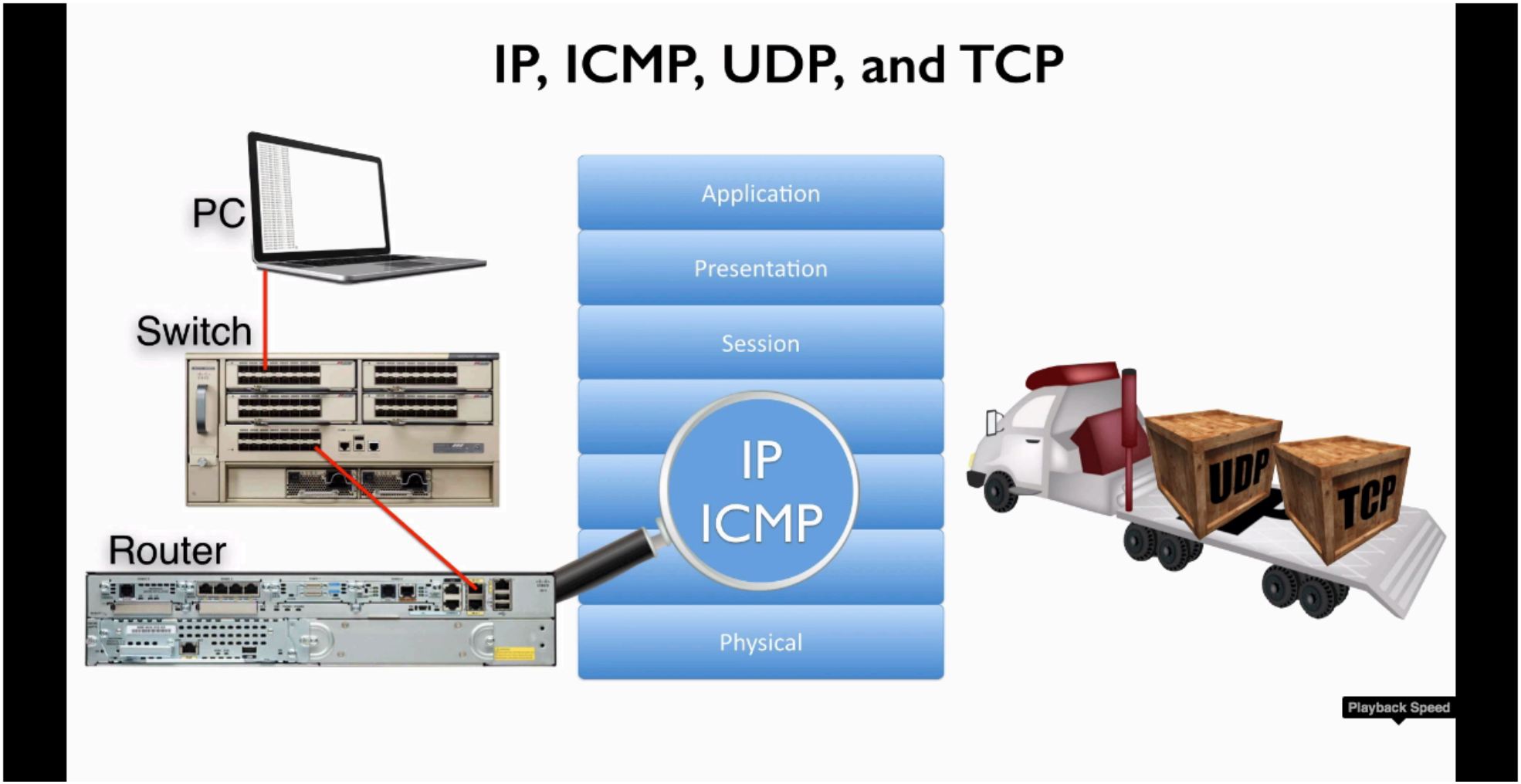

IP, ICMP, UDP, and TCP

```
Kevins-Mac-mini:~ Kevin$
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Kevins-Mac-mini:~ Kevin$
Kevins-Mac-mini:~ Kevin$
Kevins-Mac-mini:~ Kevin$
Kevins-Mac-mini:~ Kevin$
Kevins-Mac-mini:~ Kevin$ ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1): 56 data bytes
64 bytes from 192.168.1.1: icmp_seq=0 ttl=64 time=0.719 ms
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=0.853 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.773 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=0.793 ms
^C
--- 192.168.1.1 ping statistics ---
4 packets transmitted, 4 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 0.719/0.785/0.853/0.048 ms
Kevins-Mac-mini:~ Kevin$
```
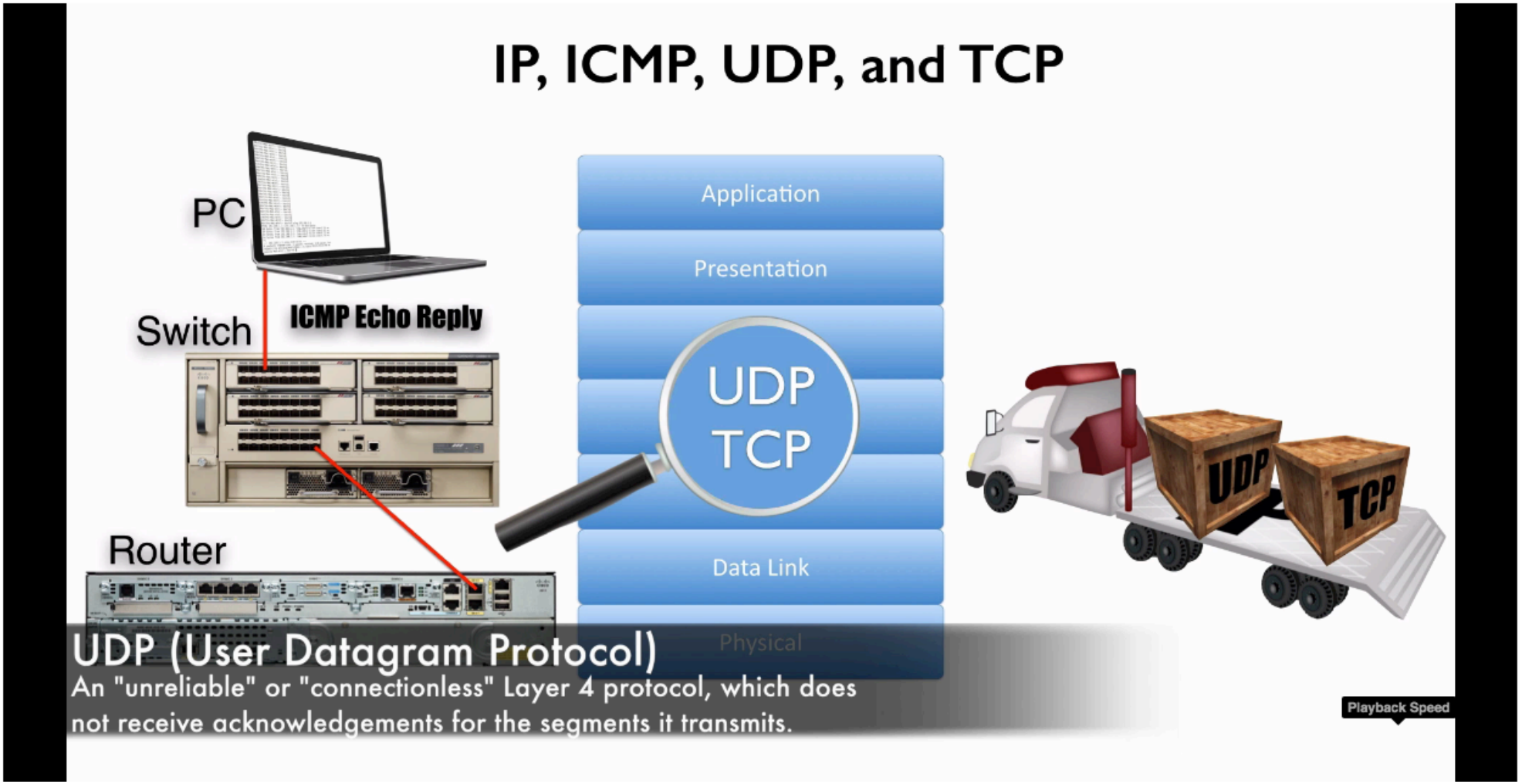

Playback Speed

Completed

IP, ICMP, UDP, and TCP



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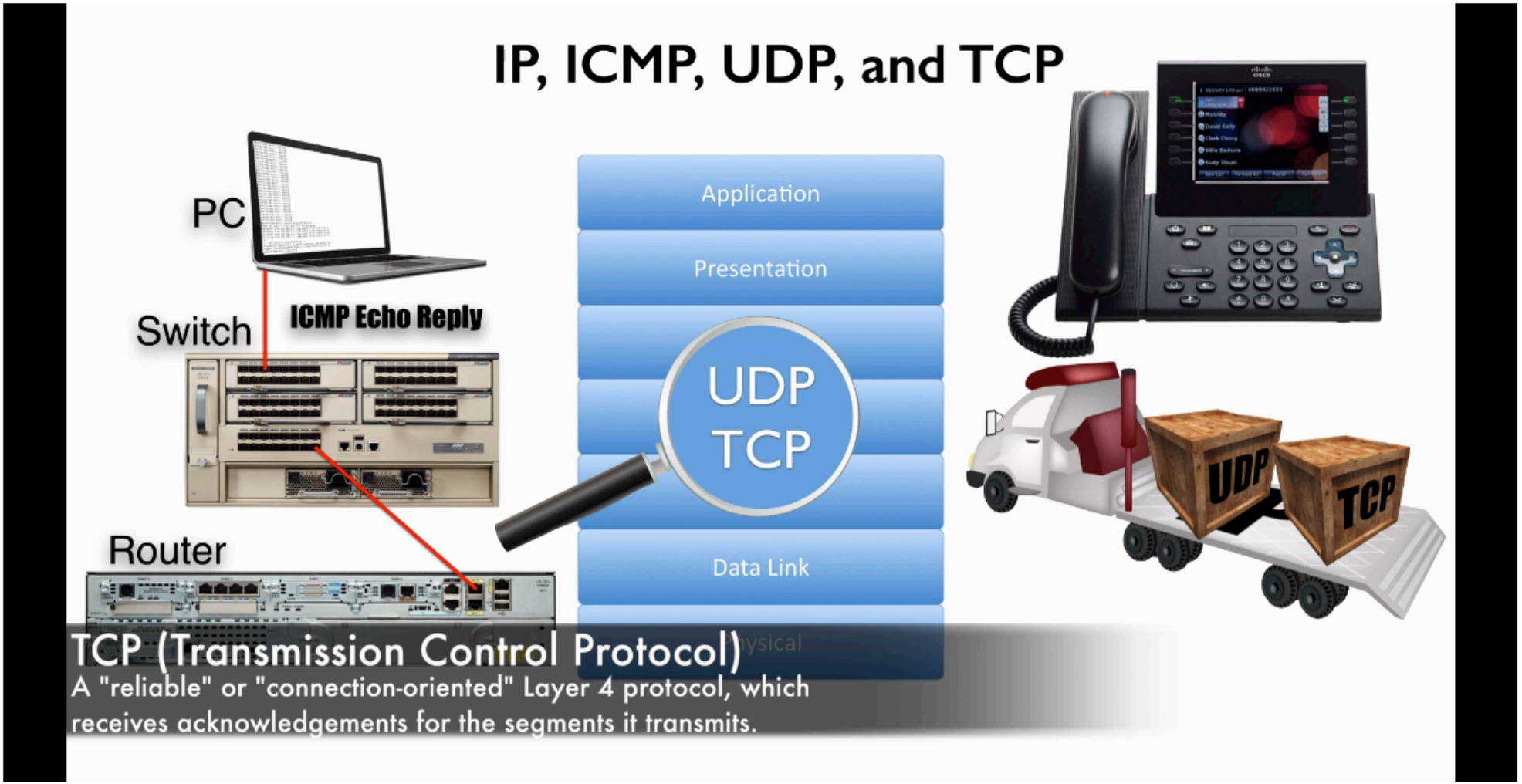
IP, ICMP, UDP, and TCP



Completed

IP, ICMP, UDP, and TCP

IP, ICMP, UDP, and TCP

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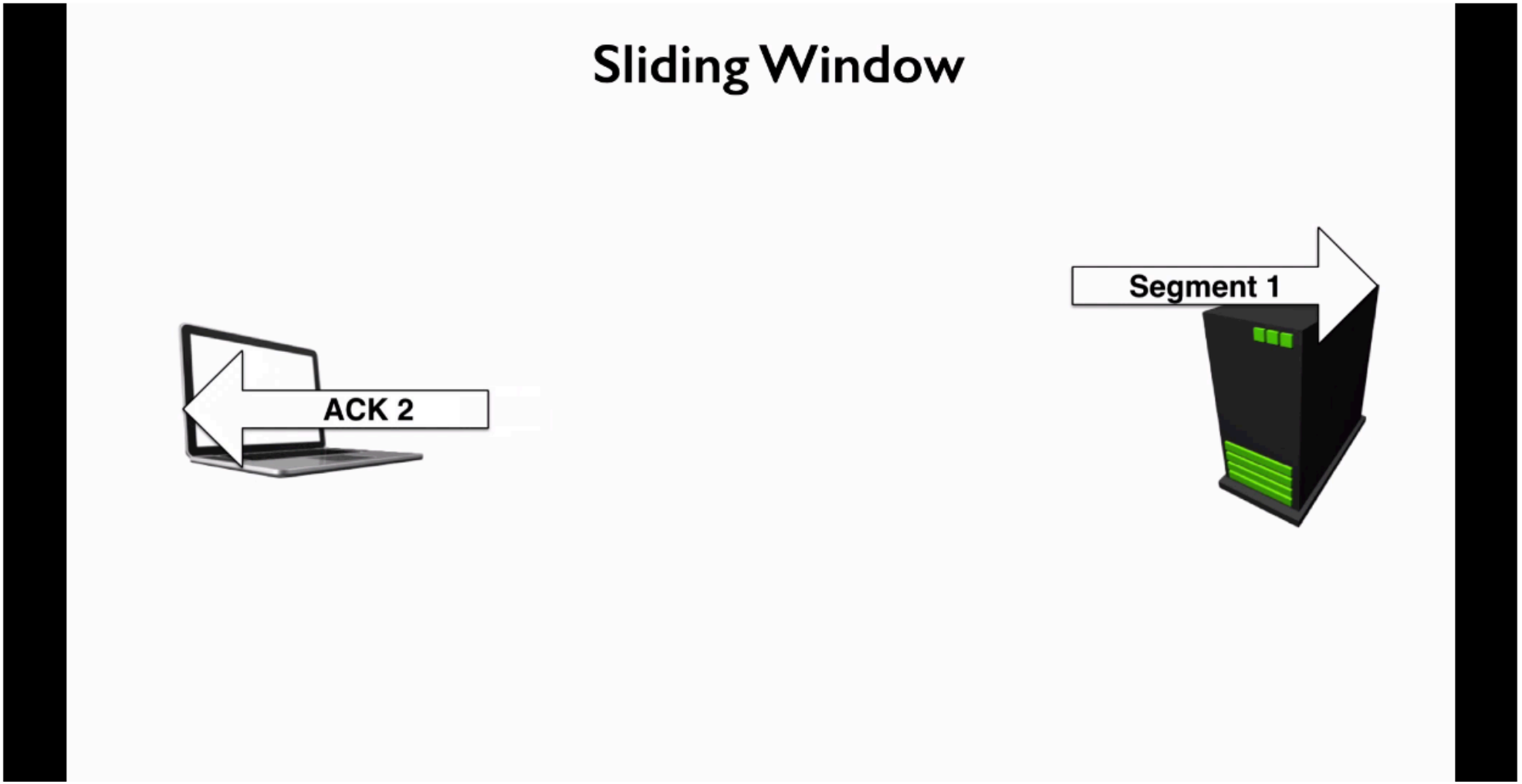
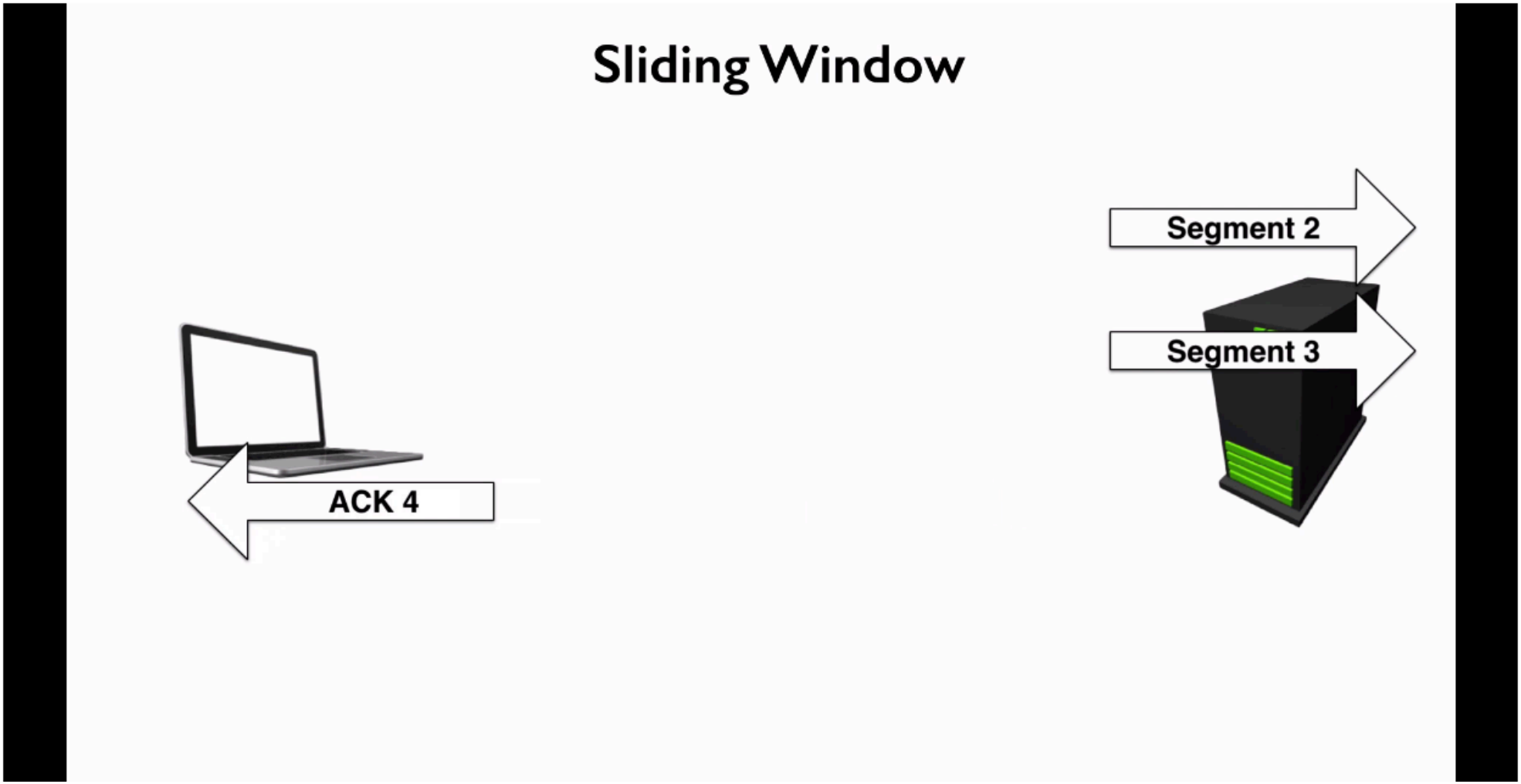
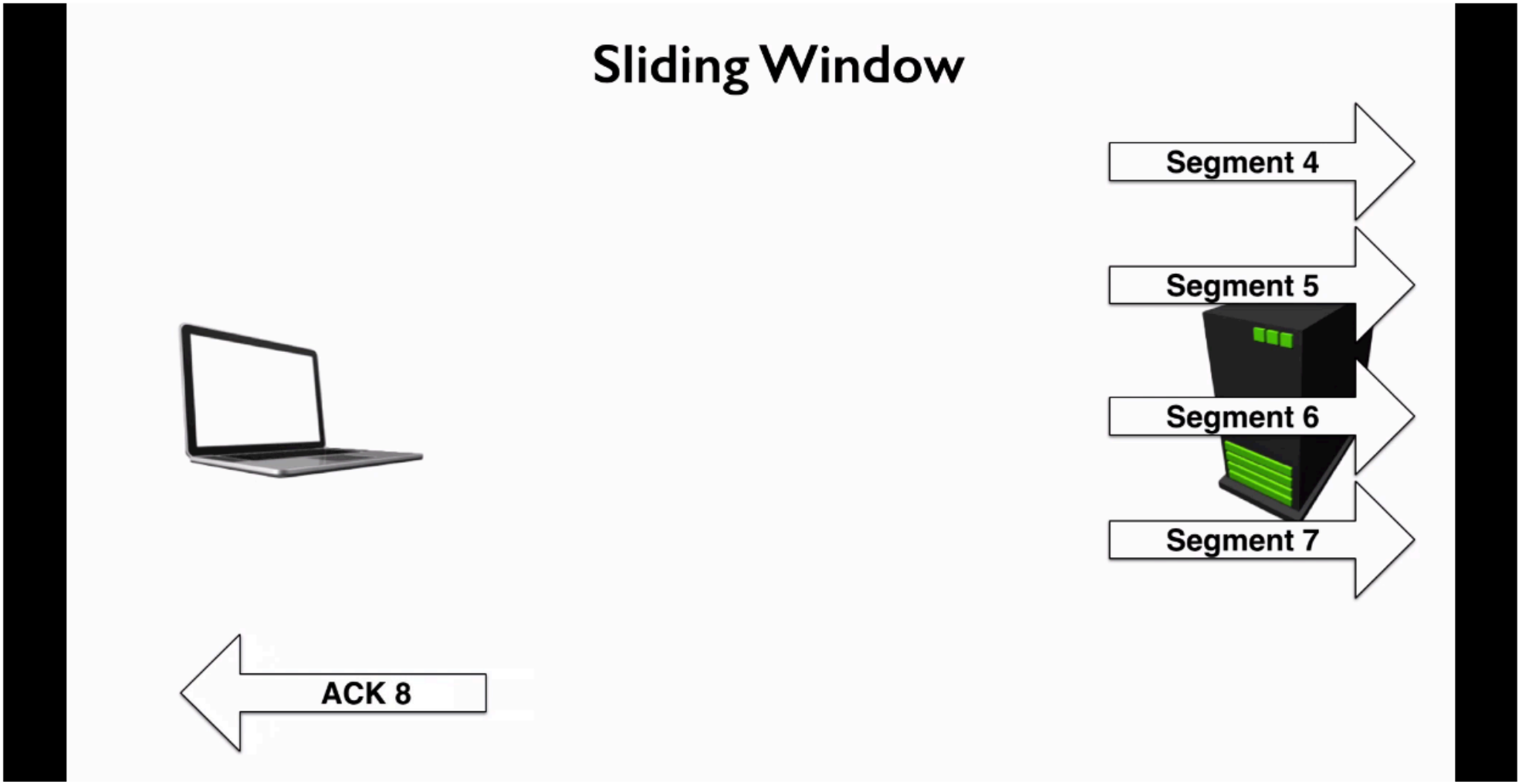
IP, ICMP, UDP, and TCP



IP, ICMP, UDP, and TCP



IP, ICMP, UDP, and TCP

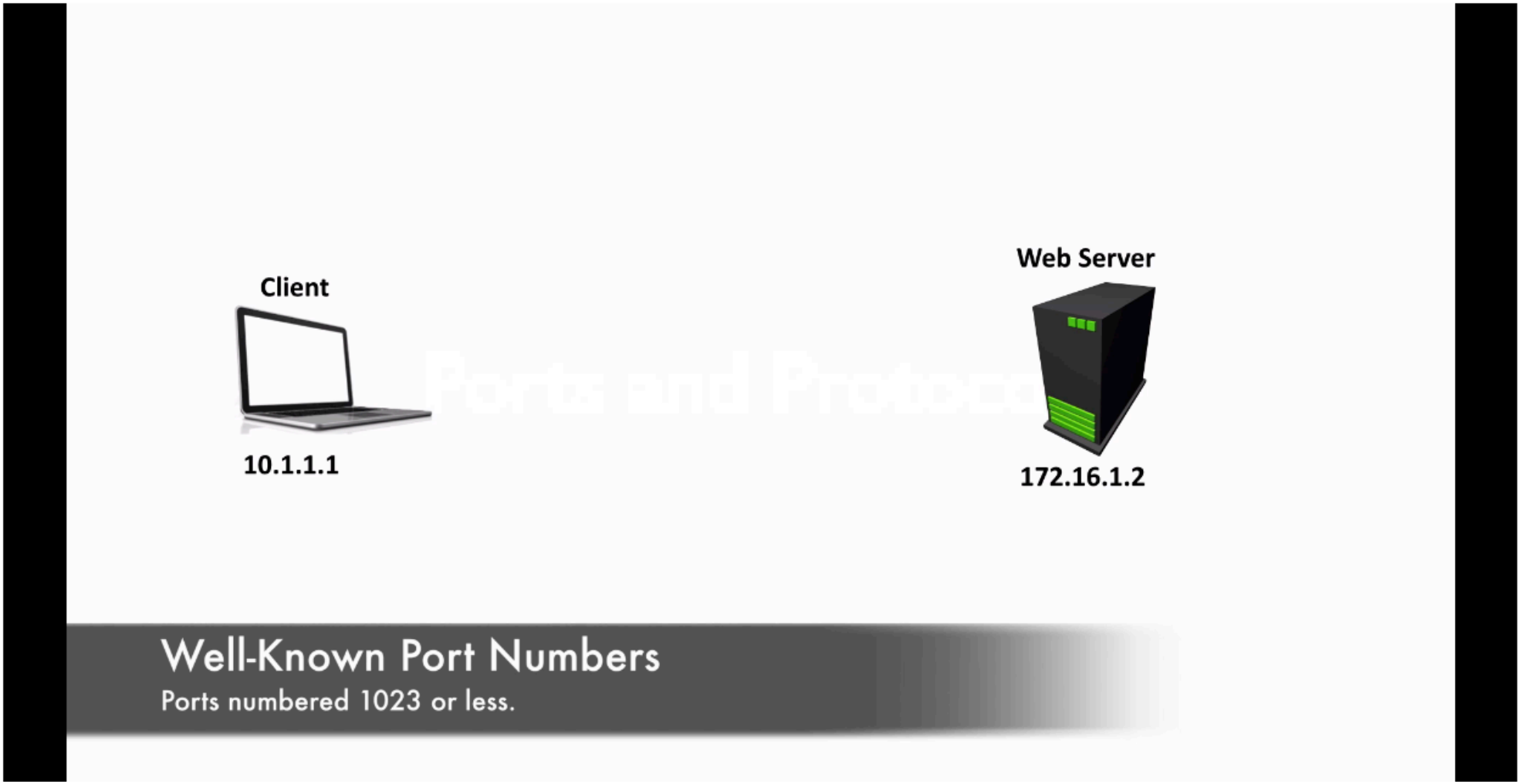


Completed

Port and Protocols

Completed

Port and Protocols



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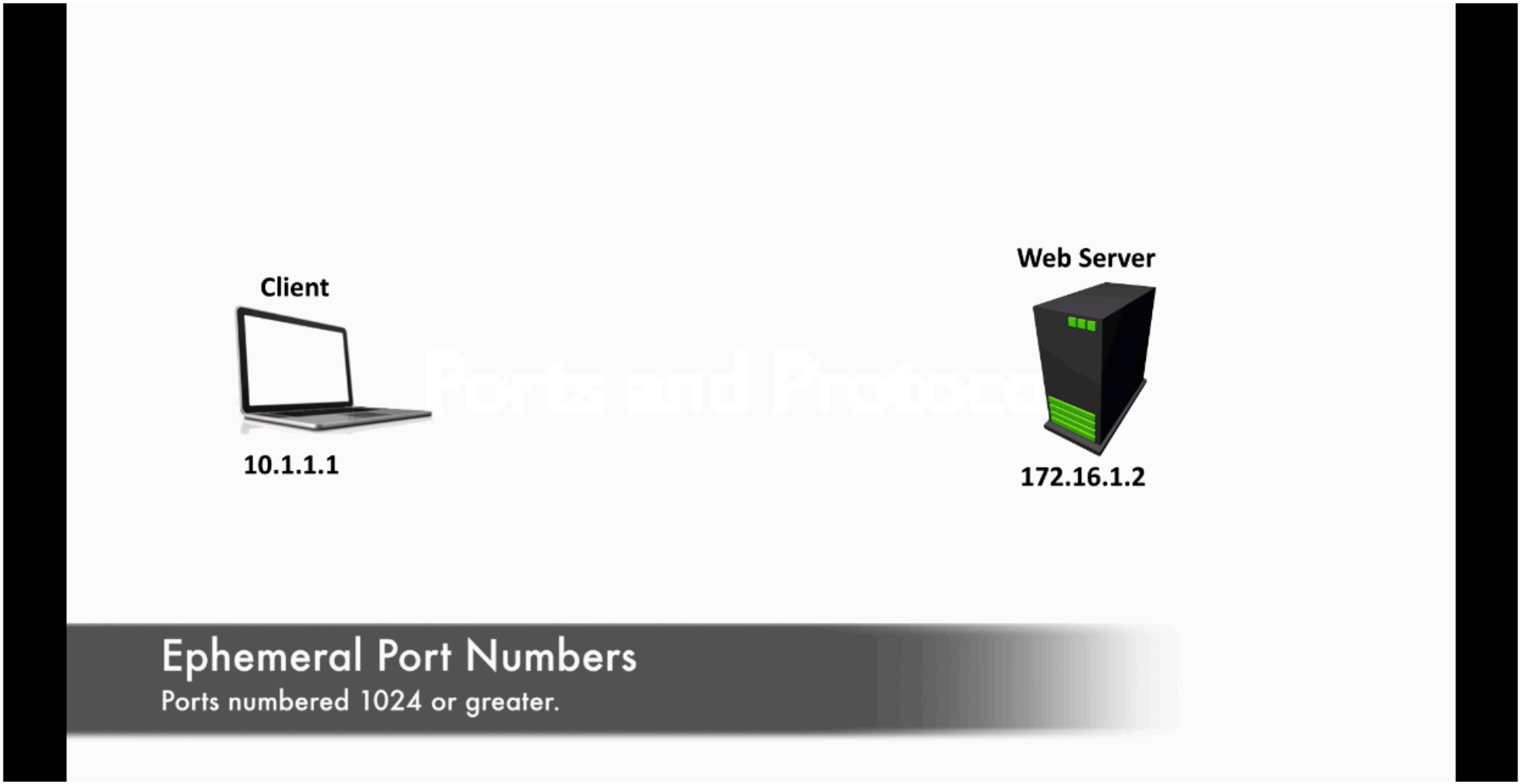
Port and Protocols



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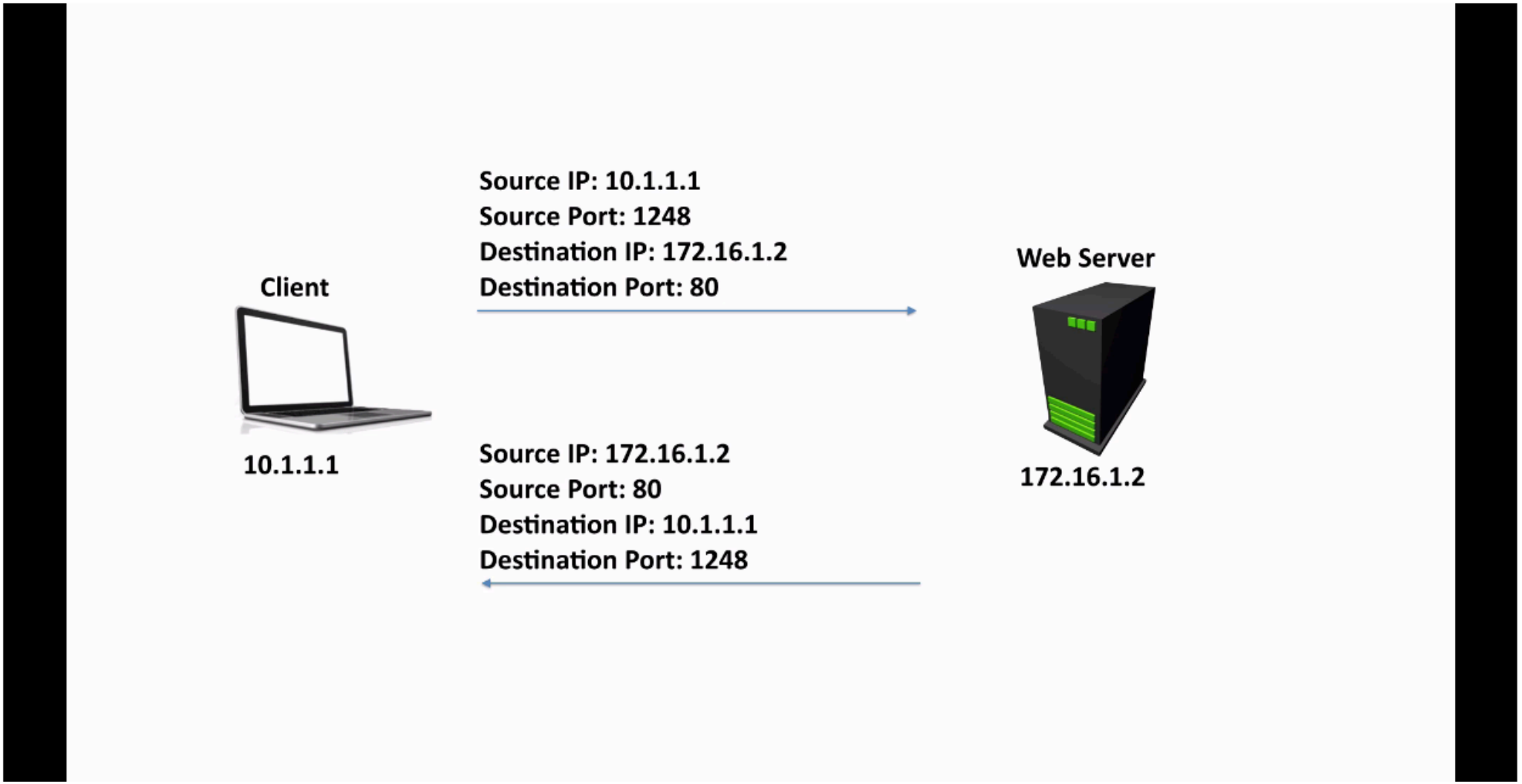
Port and Protocols



Port and Protocols

Protocol	Description	TCP Port	UDP Port
FTP	**File Transfer Protocol:** Transfers files with a remote host (typically requires authentication of user credentials)	20 and 21	
SSH	**Secure Shell:** Securely connect to a remote host (typically via a terminal emulator)	22	
SFTP	**Secure FTP:** Provides FTP file-transfer service over an SSH connection	22	
SCP	**Secure Copy:** Provides a secure file-transfer service over an SSH connection and offers a file's original date and time information, which is not available with SFTP	22	
Telnet	**Telnet:** Used to connect to a remote host (typically via a terminal emulator)	23	
SMTP	**Simple Mail Transfer Protocol:** Used for sending e-mail	25	
DNS	**Domain Name System:** Resolves domain names to corresponding IP addresses	53	53
TFTP	**Trivial File Transfer Protocol:** Transfers files with a remote host (does not require authentication of user credentials)		69
DHCP	**Dynamic Host Configuration Protocol:** Dynamically assigns IP address information (for example, IP address, subnet mask, DNS server's IP address, and default gateway's IP address) to a network device		67
HTTP	**Hypertext Transfer Protocol:** Retrieves content from a web server	80	
POP3	**Post Office Protocol version 3:** Retrieves e-mail from an e-mail server	110	
NNTP	**Network News Transport Protocol:** Supports the posting and reading of articles on Usenet news servers	119	
NTP	**Network Time Protocol:** Used by a network device to synchronize its clock with a time server (NTP server)		123
SNTP	**Simple Network Time Protocol:** Supports time synchronization among network devices, similar to Network Time Protocol (NTP), although SNTP uses a less complex algorithm in its calculation and is slightly less accurate than NTP		123
IMAP4	**Internet Message Access Protocol version 4:** Retrieves e-mail from an e-mail server	143	
LDAP	**Lightweight Directory Access Protocol:** Provides directory services (for example, a user directory—including username, password, e-mail, and phone number information) to network clients	389	
HTTPS	**Hypertext Transfer Protocol Secure:** Used to securely retrieve content from a web server	443	
rsh	**Remote Shell:** Allows commands to be executed on a computer from a remote user	514	
RTSP	**Real Time Streaming Protocol:** Communicates with a media server (for example, a video server) and controls the playback of the server's media files	554	554
RDP	**Remote Desktop Protocol:** A Microsoft protocol that allows a user to view and control the desktop of a remote computer	3389	