Protocol Deep Dive: SSH and Telnet

THE SECURE SHELL (SSH) PROTOCOL

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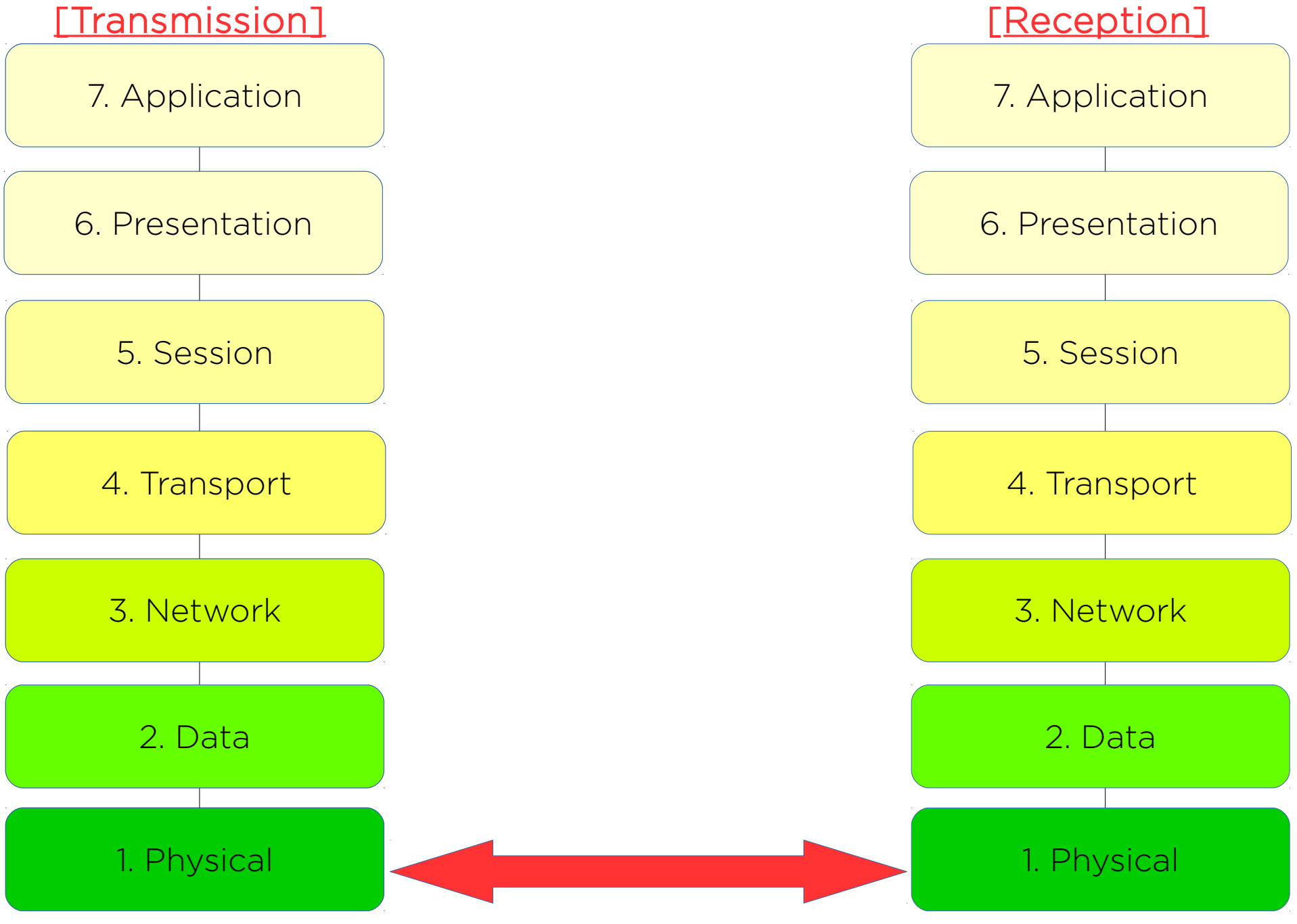
Communication Protocol

"Accepted rules that establish the synchronization methodology and syntax that parties to a communication session will use to govern their exchanges."

The OSI Model



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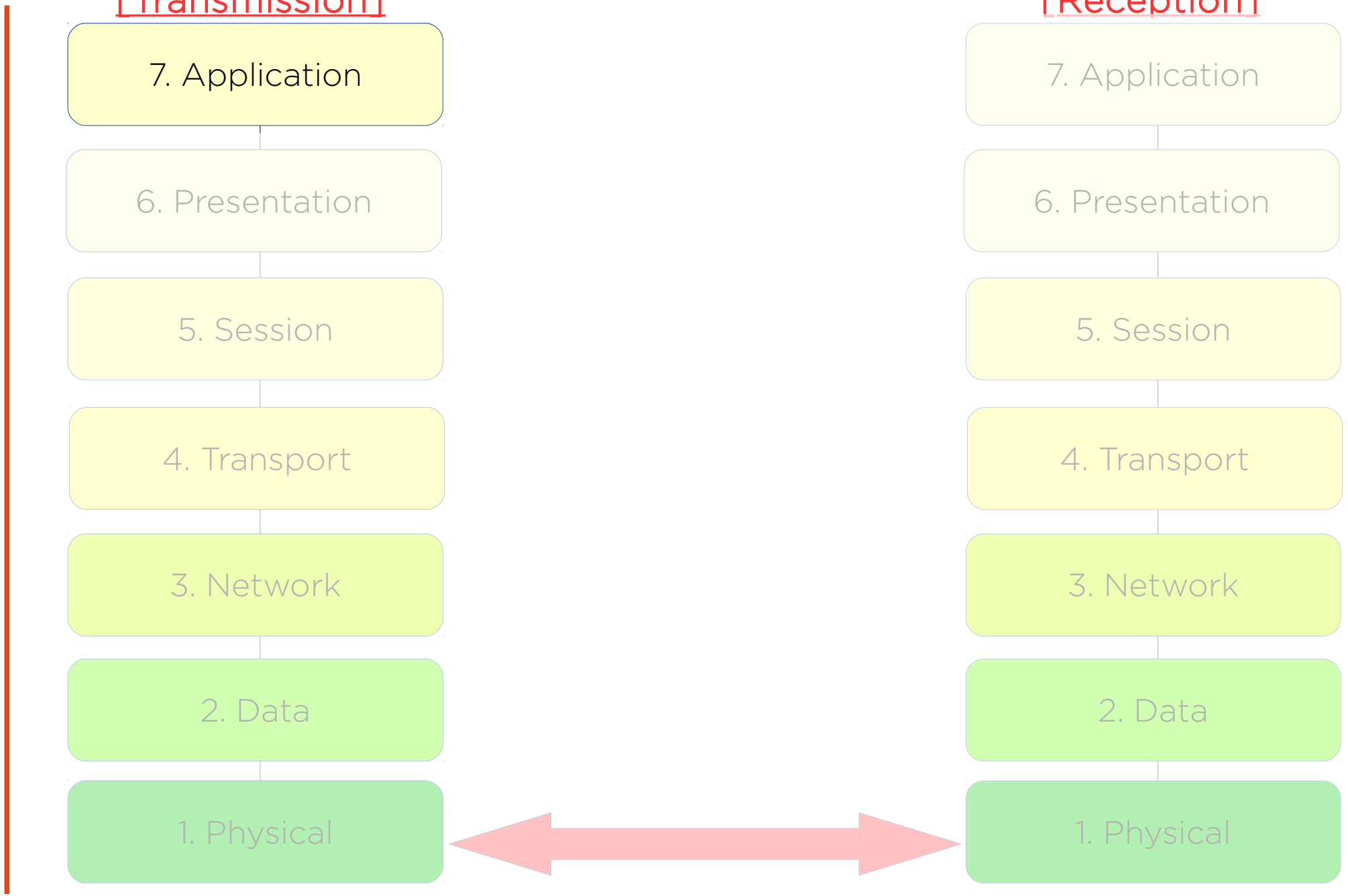

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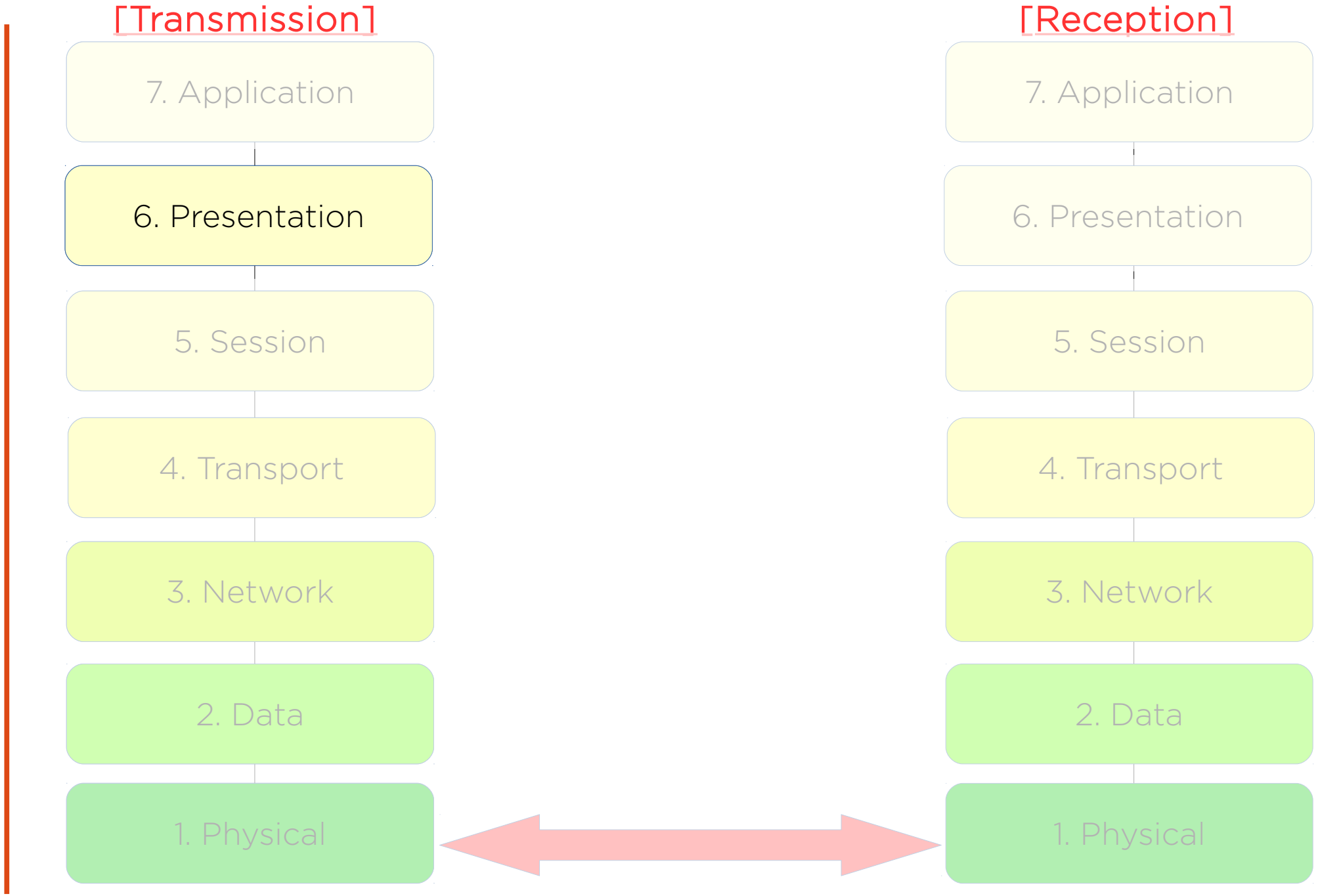

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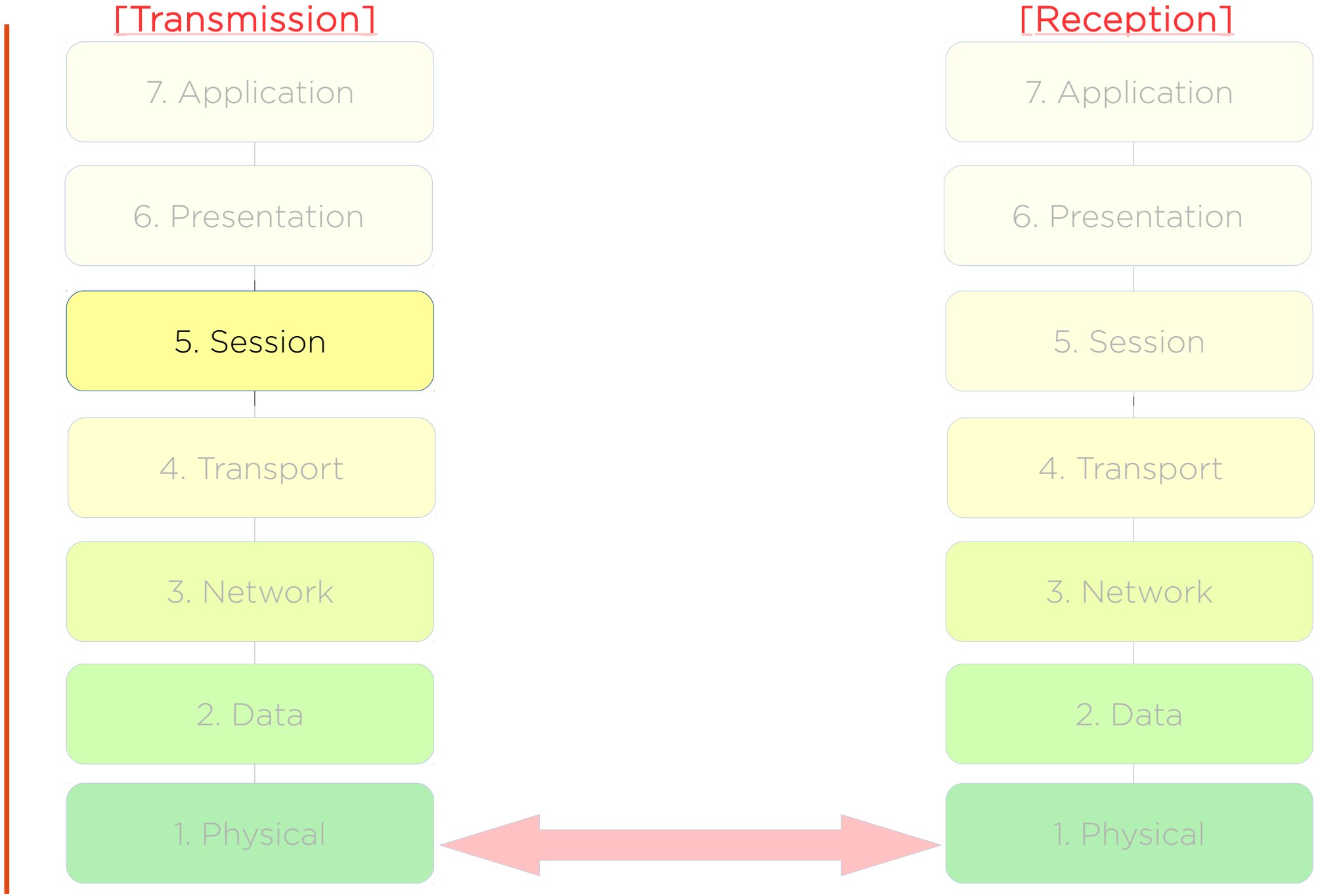

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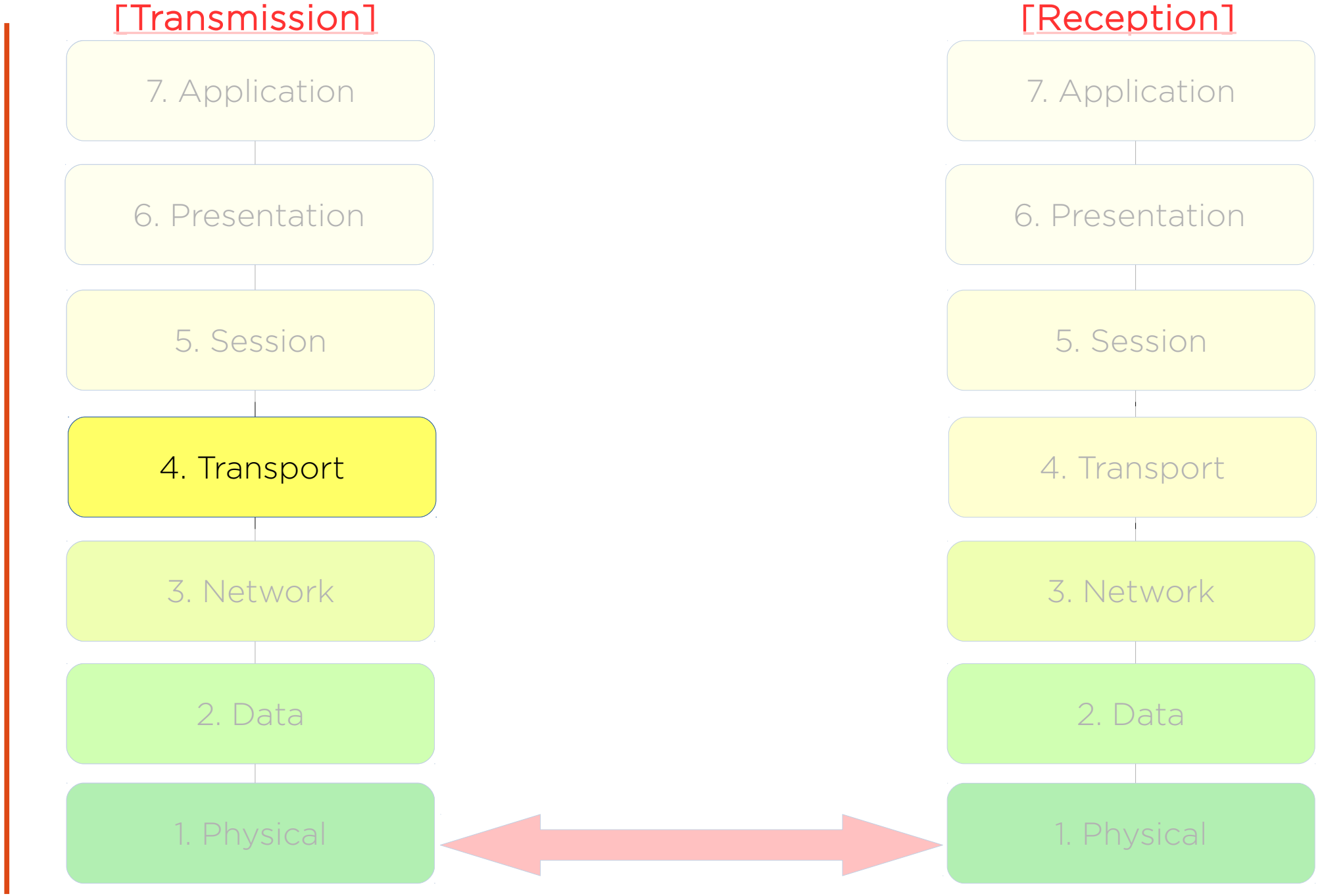

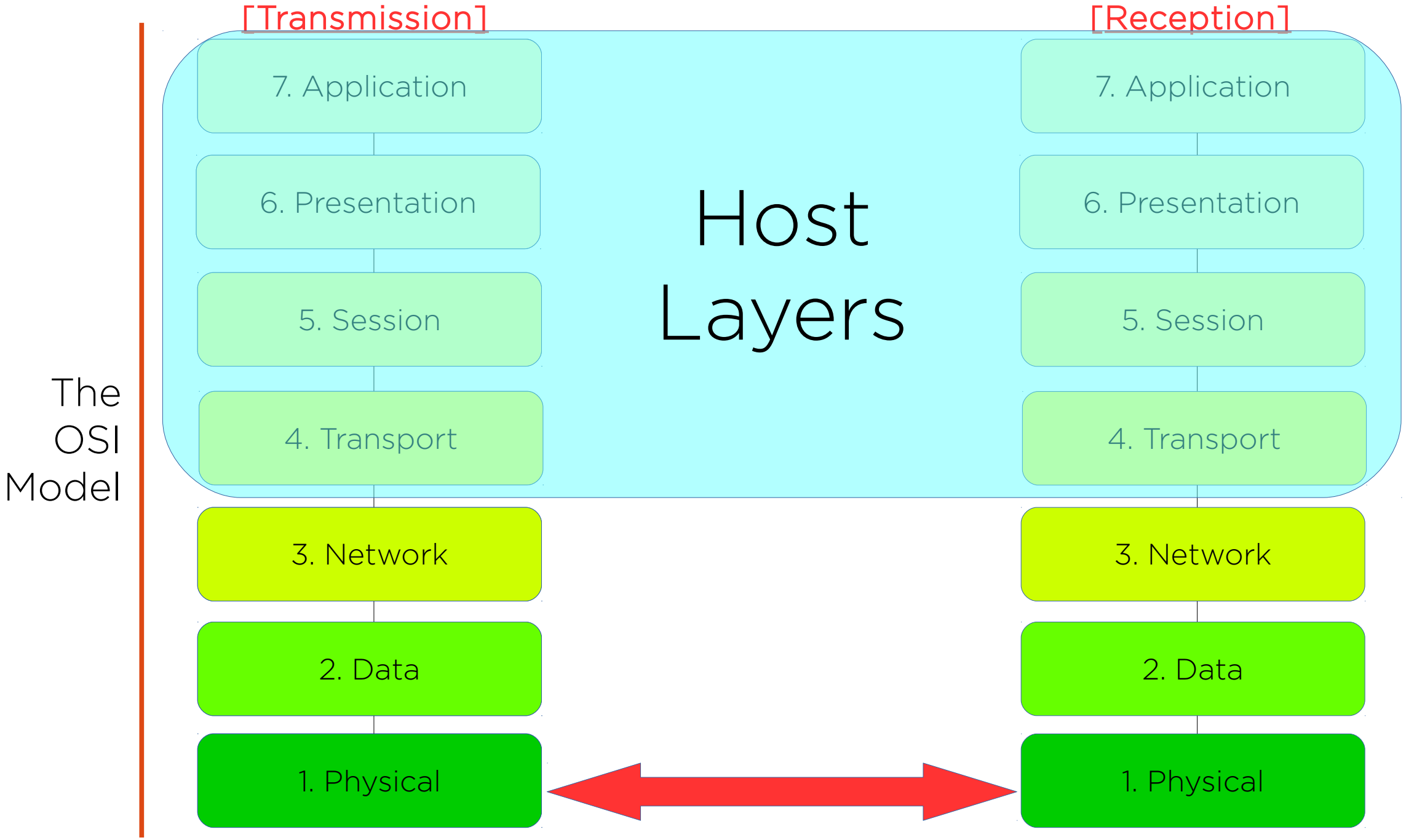
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5. Session
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2. Data
1. Physical
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2. Data
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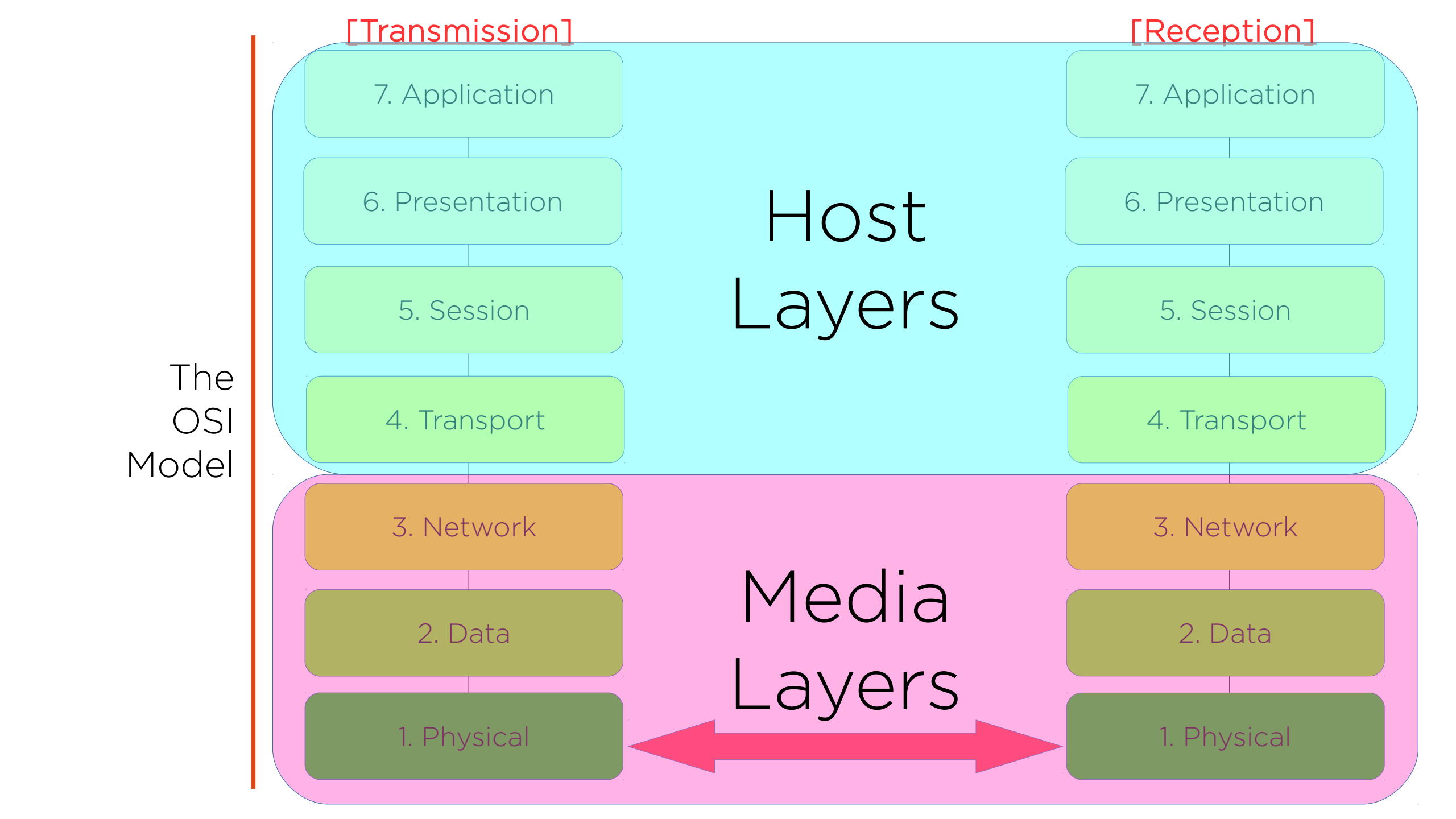
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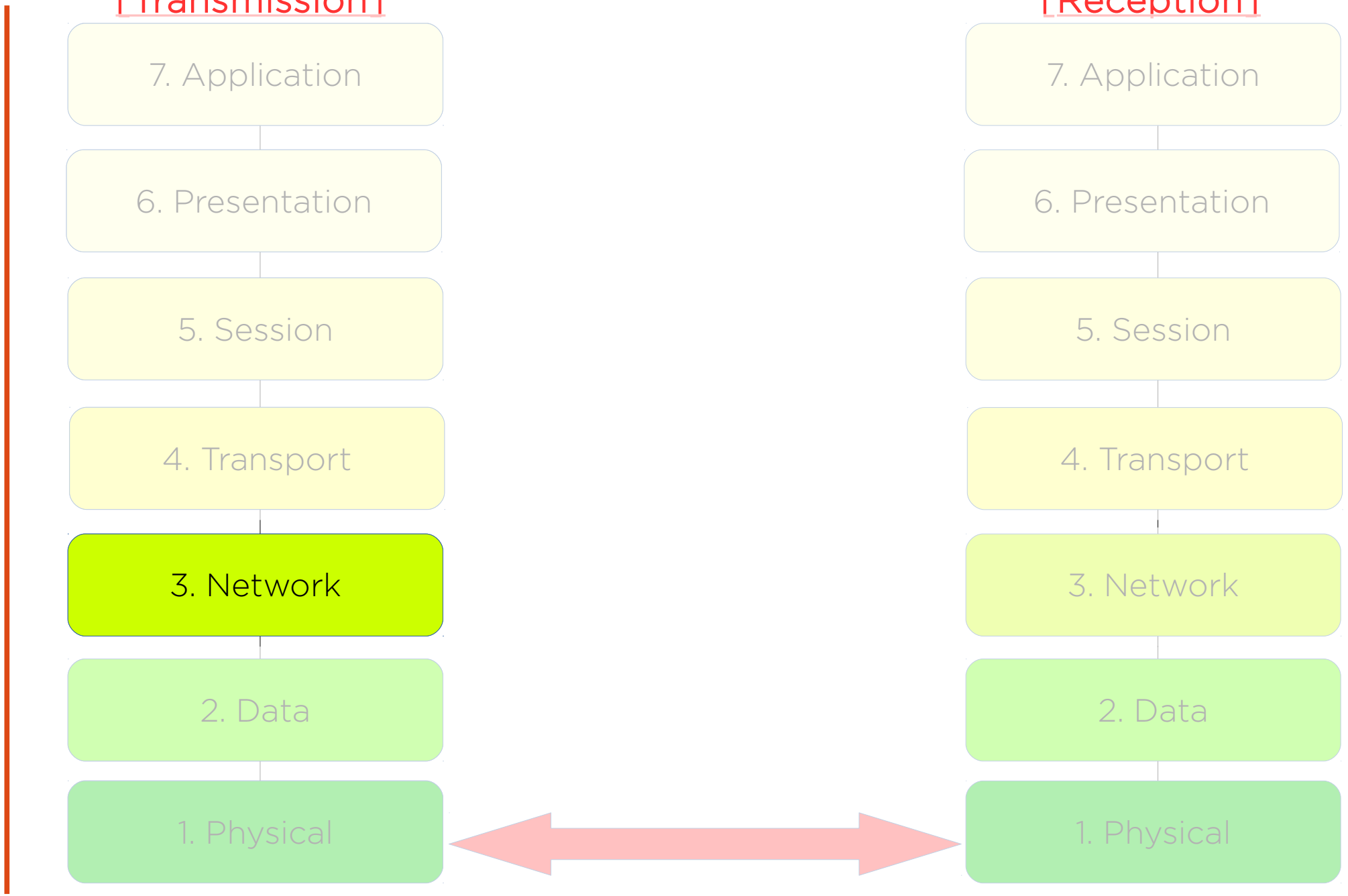

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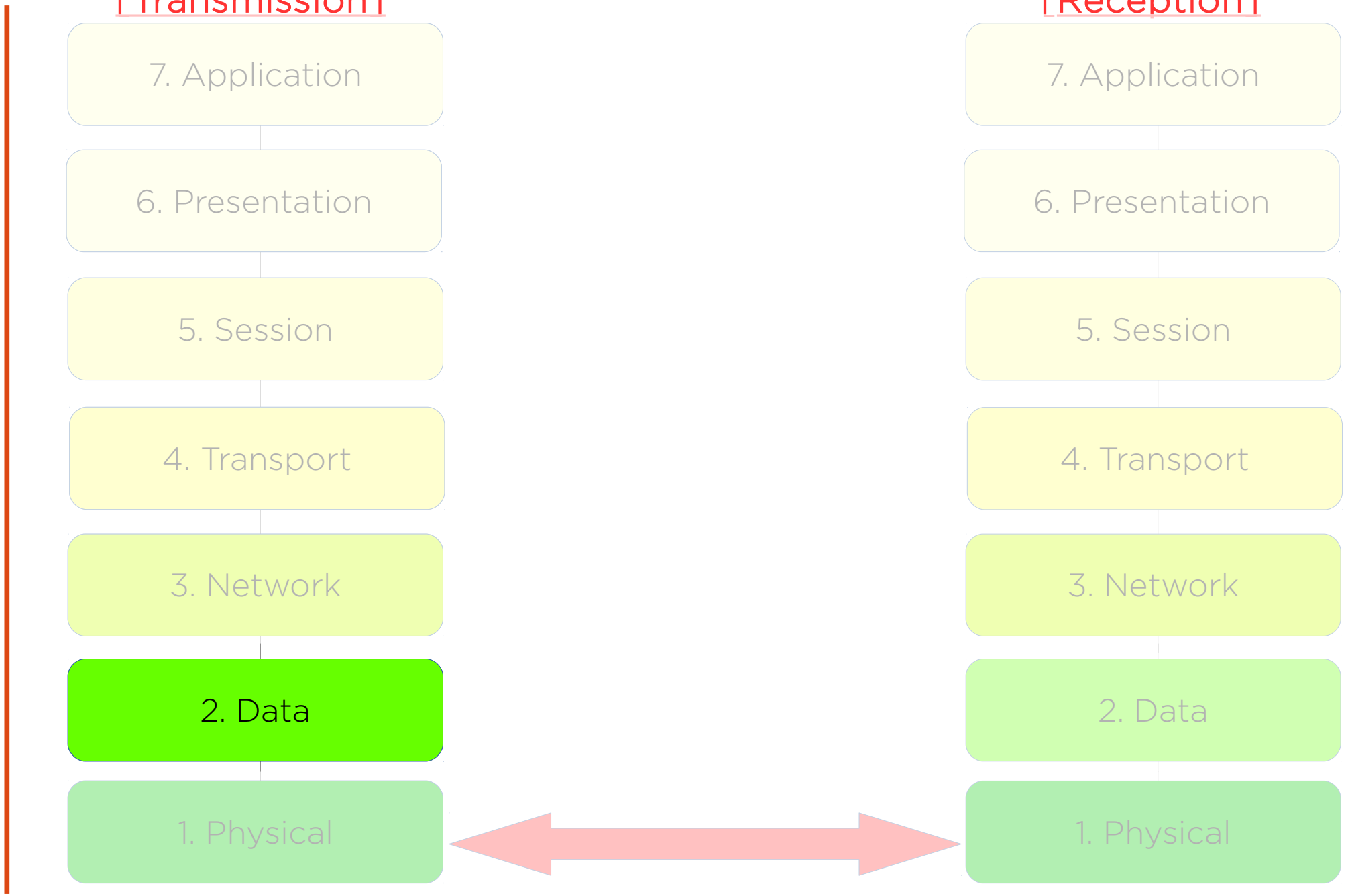

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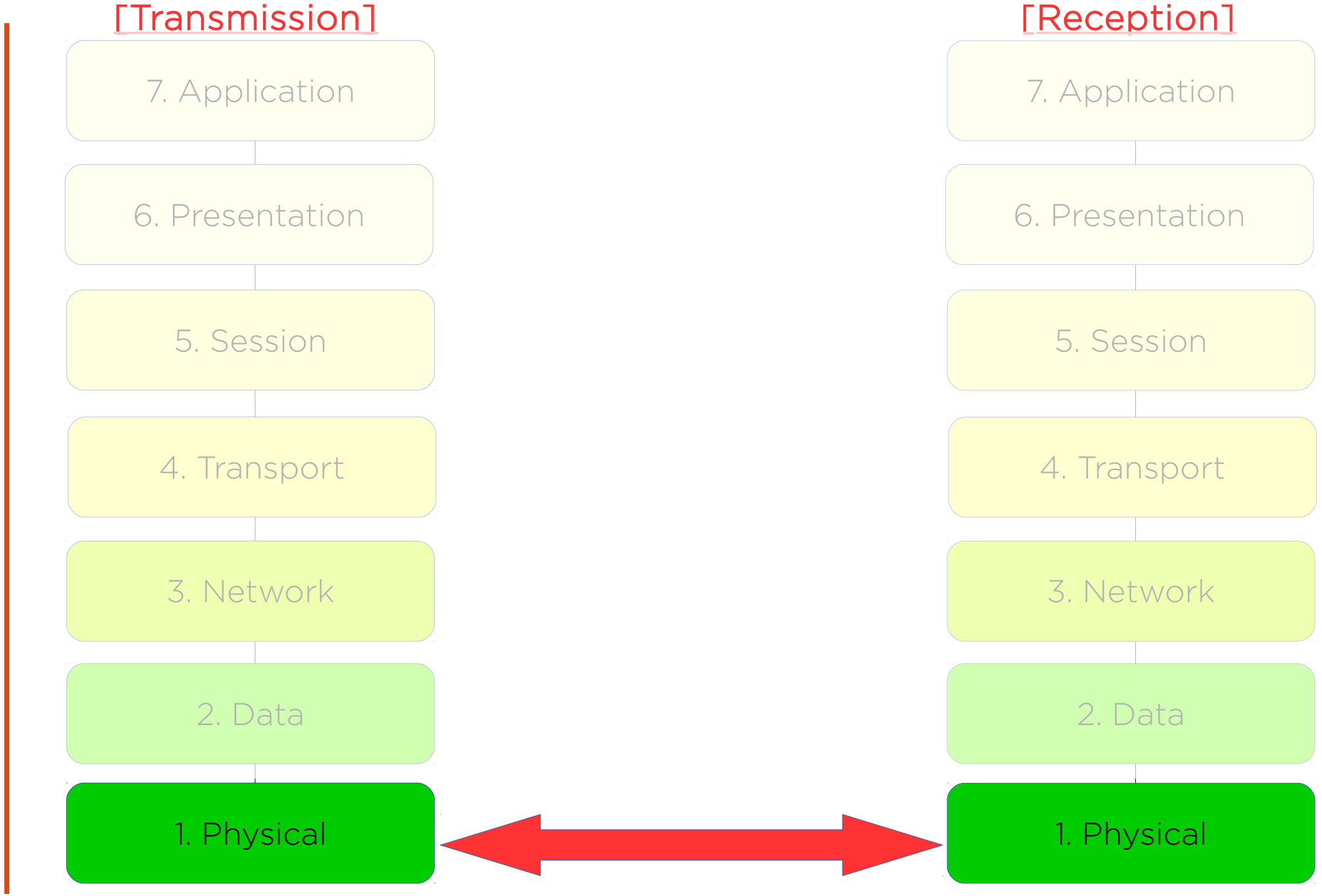

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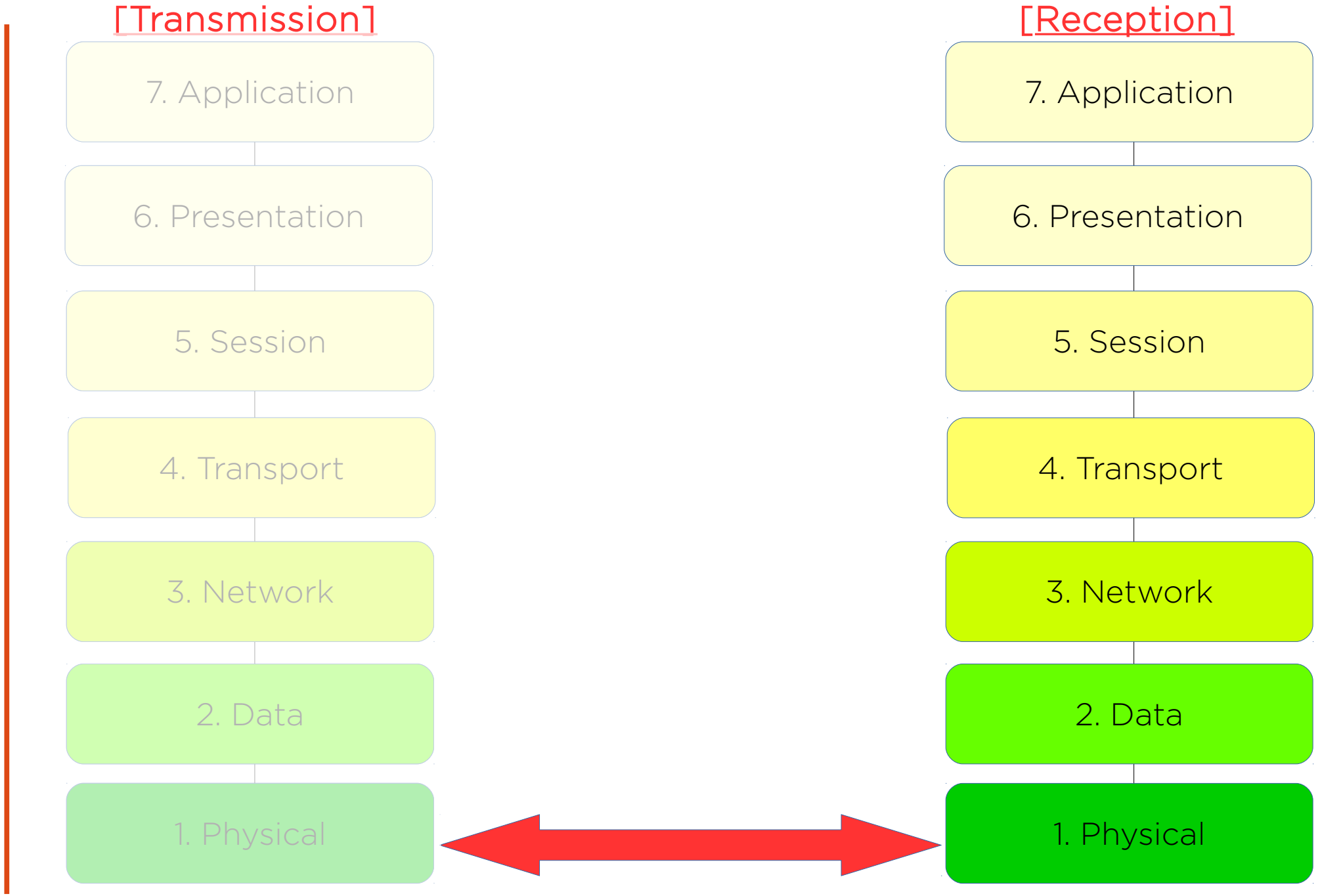

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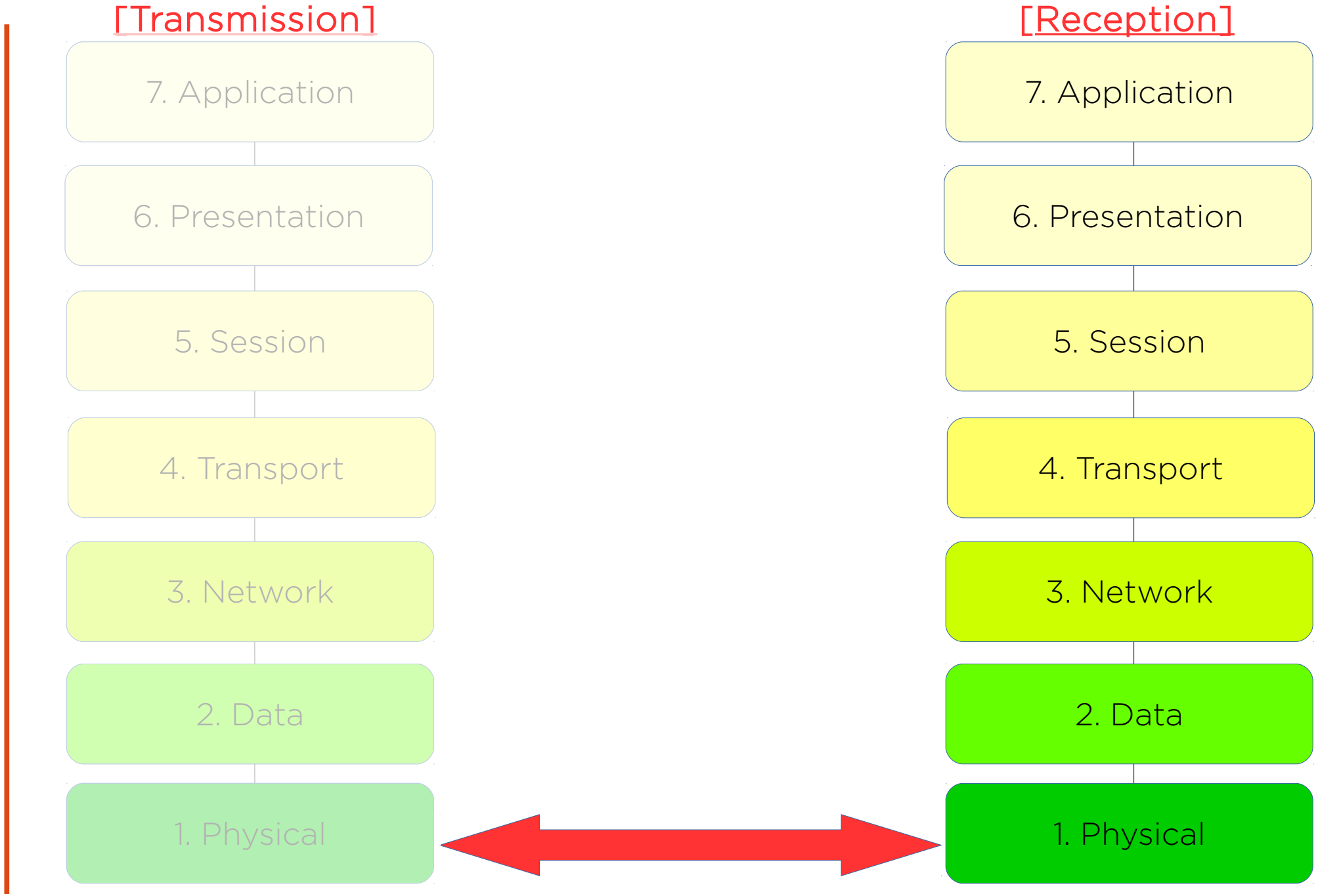
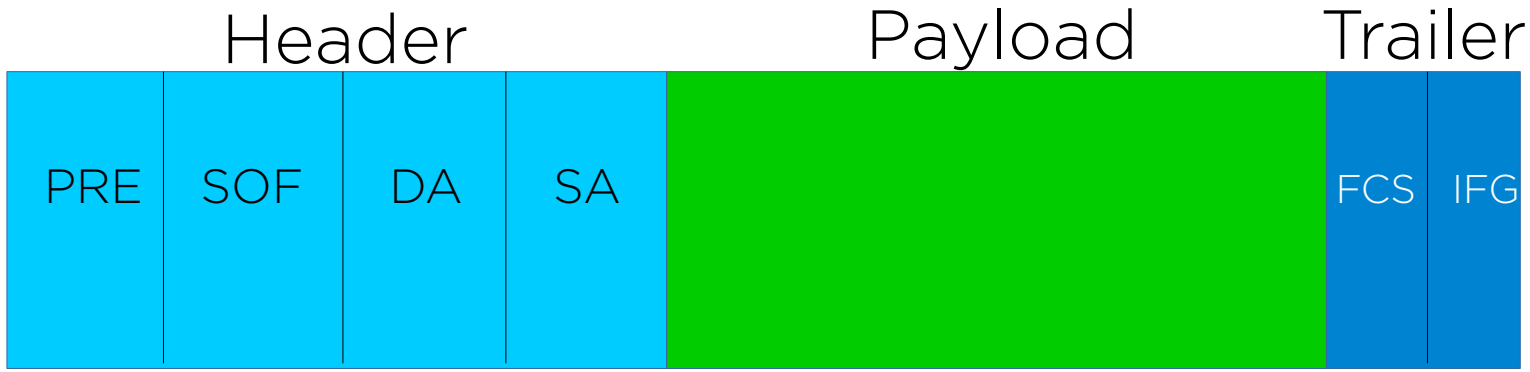


Ethernet IEEE 802.3 Data Frame Structure



Header
- Preamble (PRE)
- Start of Frame Delimiter (SOF)
- Destination Address (DA)
- Source Address (SA)
- Type

Payload

Trailer
- Frame Check Sequence (FCS)
- Interframe Gap (IFG)

SSH: The Secure Shell

SSH Session Types

1. RSA rhost authentication
2. Private/public keypair authentication
3. Password authentication

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   /etc/hosts.equiv

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   - /etc/hosts.equiv
   - /etc/ssh/shosts.equiv
   - /home/username/.rhosts
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   - /home/username/.rhosts
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2. Private/public keypair authentication
3. Password authentication

   algorithms: RSA, DSA, OpenPGP

SSH Files (Linux)

SSH user keys location:

/home/username/.ssh/

SSH system keys location:

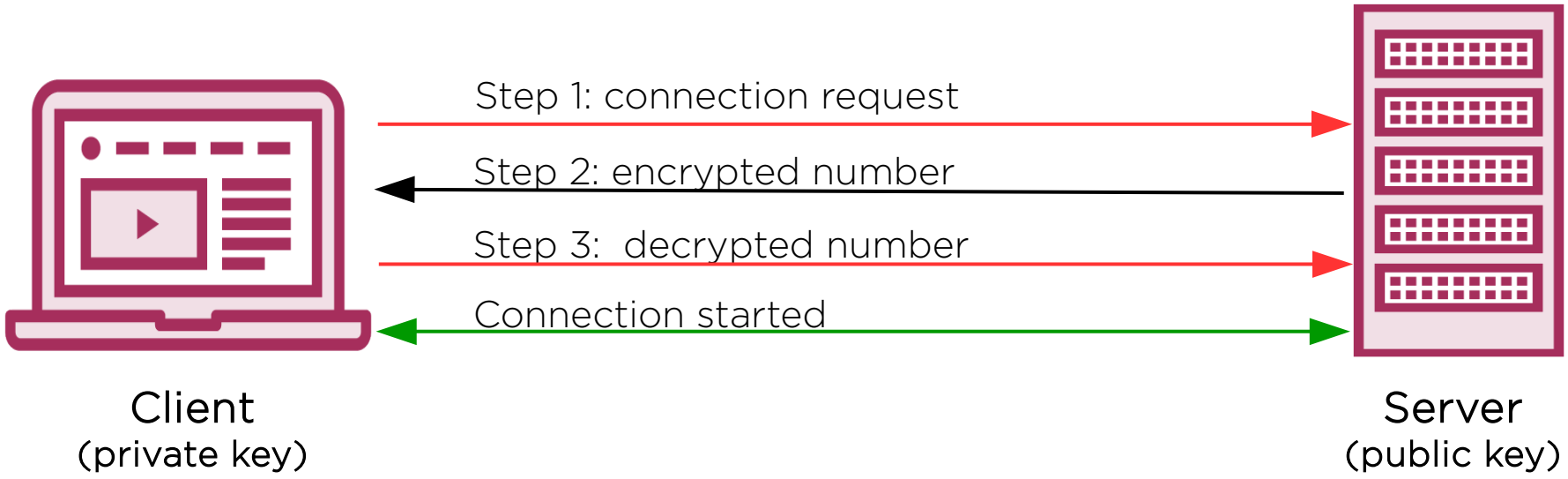
/etc/ssh/

SSH configuration files:

/etc/ssh/ssh_config (Control client behavior)

/etc/ssh/sshd_config (Control server behavior)

SSH Key Exchange

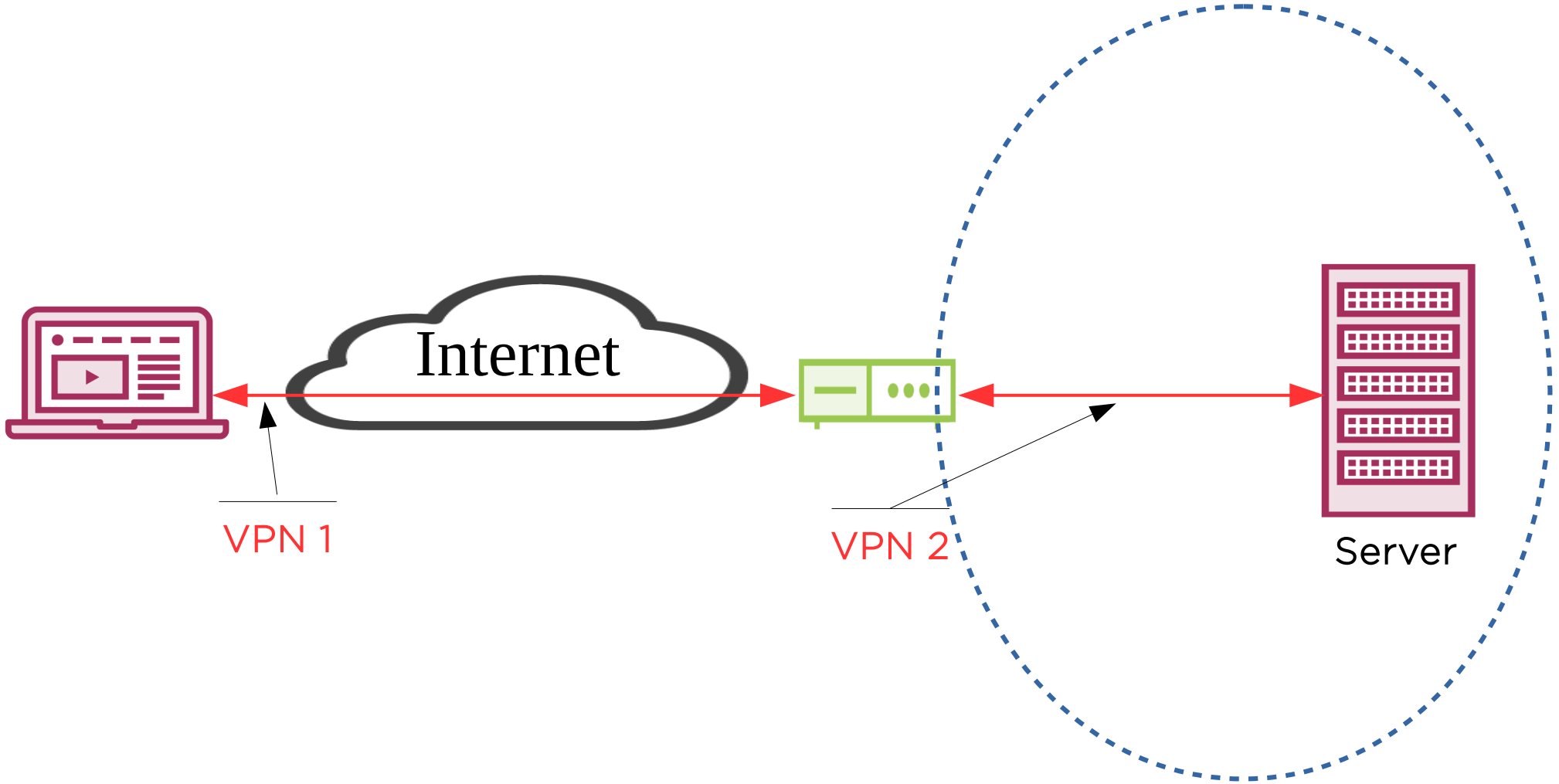


SSH: Debugging Tools

Troubleshooting: Usage Errors

Troubleshooting: Scenarios

Multiple VPNs



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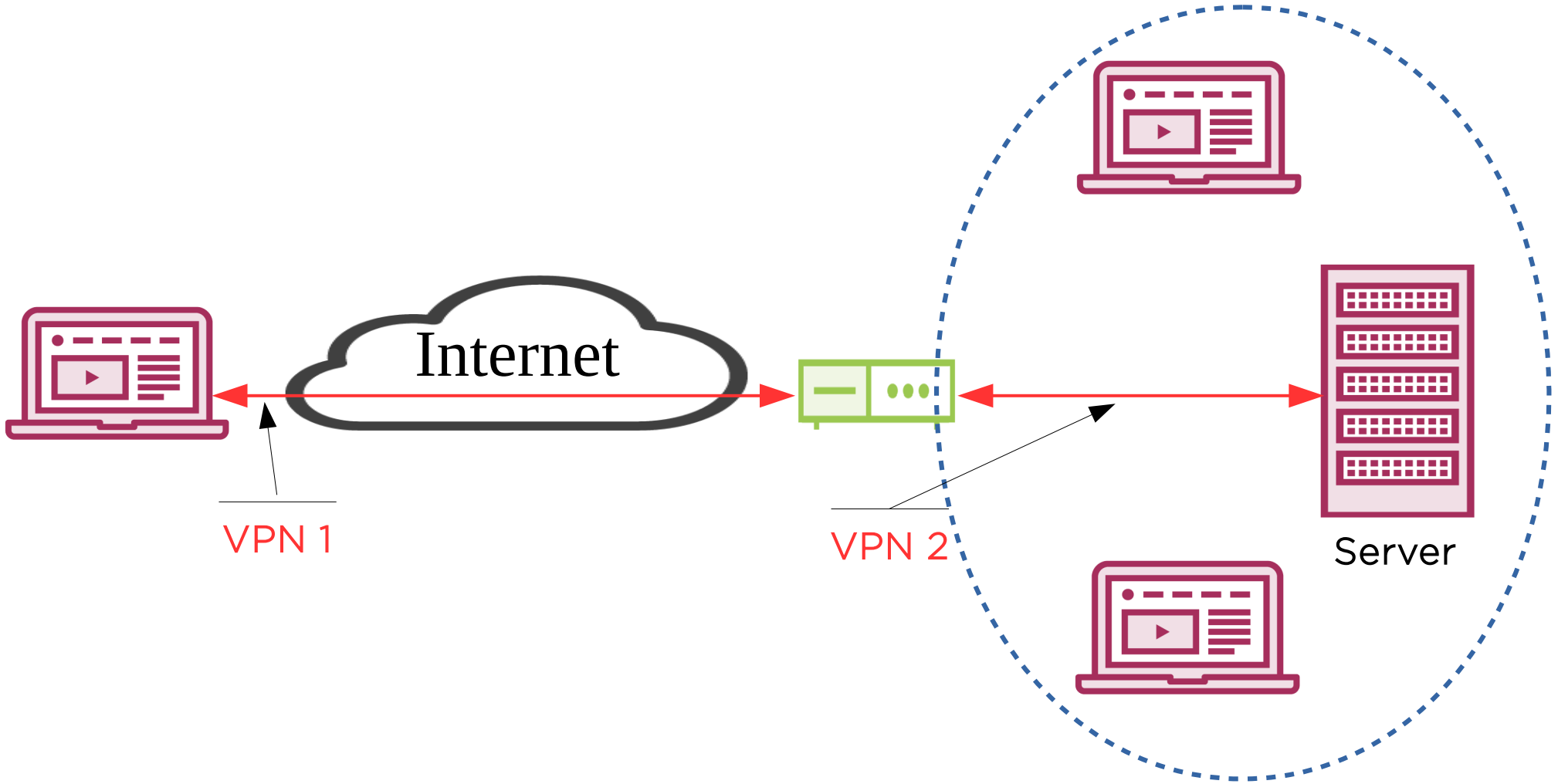

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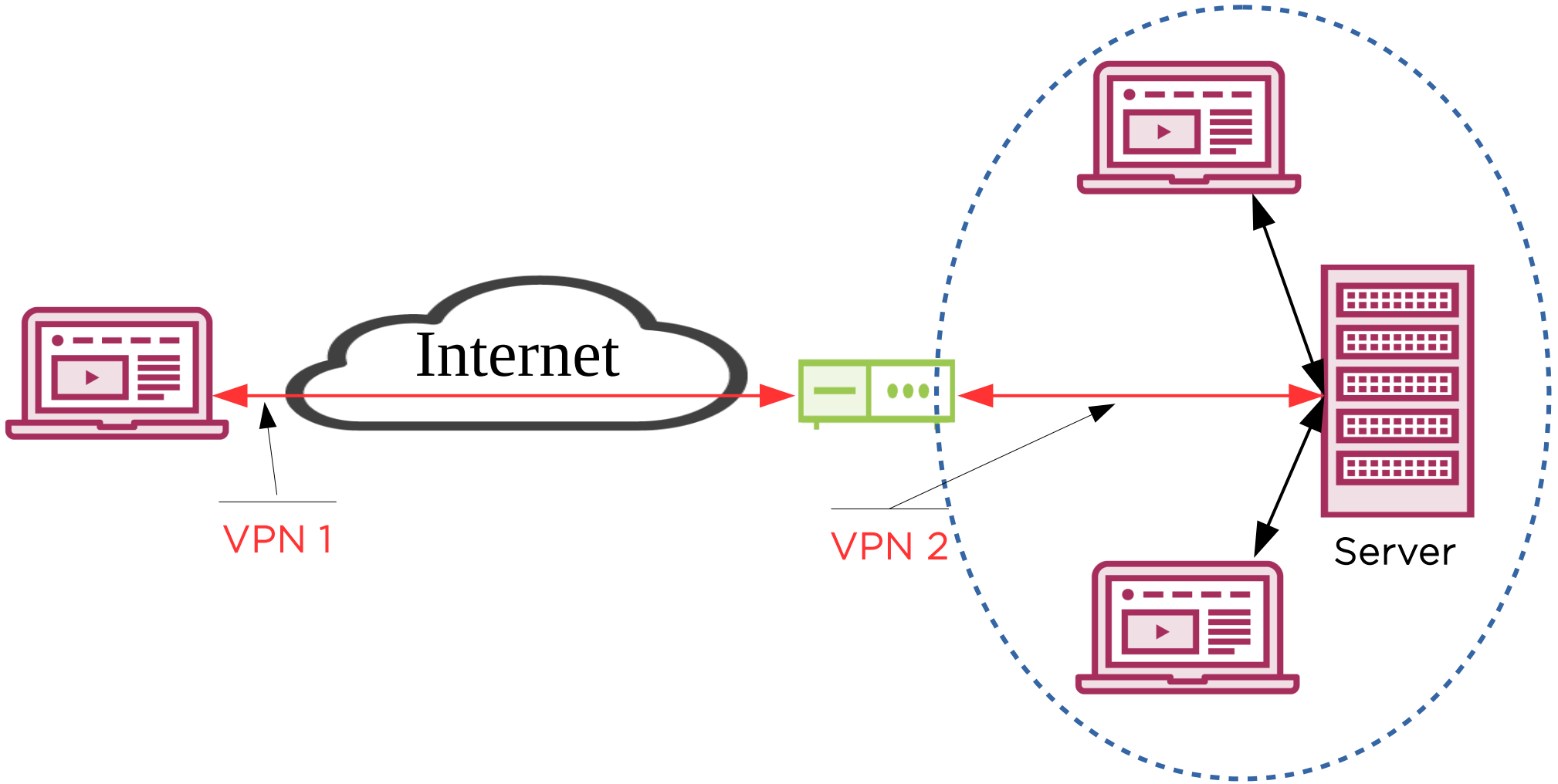

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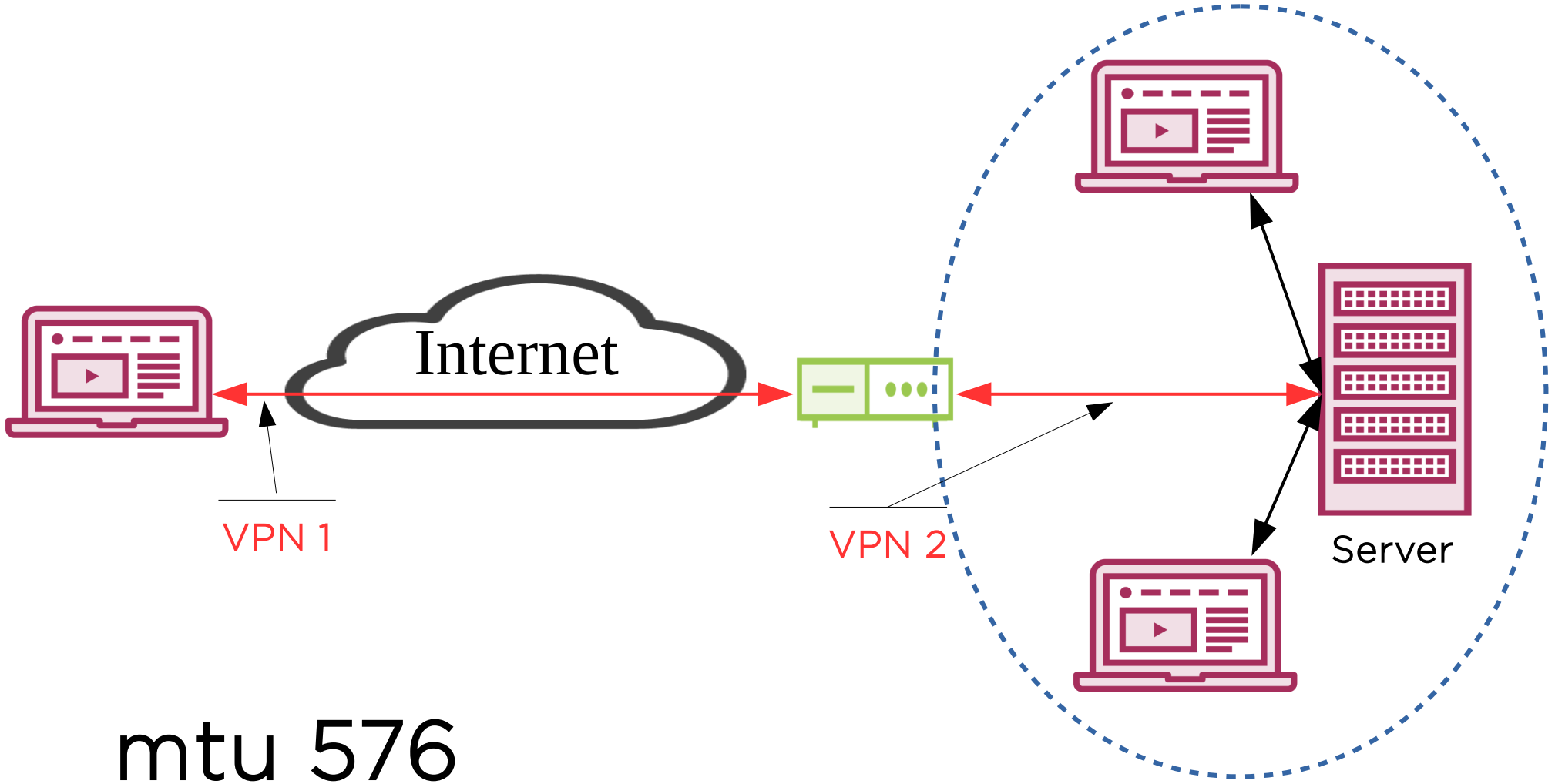

mtu 576

Review

OSI Session Layer (5)

SSH authentication: RSA rhost

SSH authentication: public/private keypair

SSH authentication: password

ssh-add ~/.ssh/id_rsa

/home/username/.ssh/known_hosts

/etc/ssh/sshd_conf

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Wireshark | Follow TCP Stream

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sudo /usr/sbin/sshd -d -p 2020

systemctl status sshd

ping 192.1.68.0.100

sudo tcpdump -n -i enp0s3 tcp port 22 and host 192.168.0.100

TCPKeepAlive yes

chmod 600 id_rsa

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