INDIVIDUAL RESEARCH SUMMARY: OSI MODEL IN LAN COMMUNICATION

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Overview

The OSI (Open Systems Interconnection) model is a conceptual framework and protocol architecture for developing protocol standards. This was developed by the International Organization for Standardization. It standardizes the functions of a computing system into seven distinct layers. It helps in understanding how data flows across a network and how different protocols interact. This guides how devices communicate and ensures interoperability between hardware and software systems

LAYER BY LAYER BREAKDOWN

LAYER	**FUNCTION**	**EXAMPLES**	**RELEVANCES**	**TROUBLESHOOTING SCENARIO OF LAYERS**
Application	Provides access to the OSI environment for users and provides distributed information services	HTTP,FTP,SMTP,DNS	Used for web browsing, email, and file sharing	Website fails to load due to web server application shutdown
Presentation	Handles formatting, Encryption, compression	JPEG,MP3,SSL/TLS,PNG,MPEG	Ensures data is presented in a readable and secure format	Encrypted data appears gibberish/missing due to missing decryption key
Session	Manages communication between systems Establishes, maintains and ends communications (K&R,2022,pp.77-79)	NETBIOS,RPC, PPTP,SIP	Controls and coordinates dialogues between applications	Session timeout due to a firewall blocking interference
Transport	Ensures reliable data transfer, error checking and flow control	TCP,UDP,SCTP	Ensures data transfer is completed	File download fails due to blocked TCP port
Network	Handles logical addressing and routing	IP,ICMP, ROUTERS OSPF	Helps to direct packets from source to destination using IP addresses	Device cannot connect because of an incorrect IP configuration
Data Link	Manages MAC addressing and error detection between nodes	Ethernet, PPP, Switches, ARP	Ensures error- free transfer over a single link	Faulty NIC(Network Interface Card) e.g. If its broken or misconfigured causes frequent frame errors
Physical	It transmits raw bits over a physical medium(K&R,2022,P.82,48-51)	Cables, Hubs, Wi-Fi radio signals	Converts data into signals	Cable unplugged =no signal

References

Kurose, J.F.,& Ross, K.W.(2021). *Computer Networking: A top-Down Approach*(8th ed.).Pearson.

Stallings, W.(2014*). Data And Computer Communications*(10th ed.)Pearson