**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

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| **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