EVALUATION OF NETWORK MODELS

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Evaluation of Network Models

Understanding different network models is essential for designing efficient and secure networks. Businesses and individuals require different models based on their needs, such as performance, scalability, and security. This document evaluates three primary network models—peer-to-peer, client/server, and thin client—while considering current networking trends such as BYOD, IoT, and cloud computing.

Peer-to-Peer (P2P) Model

- **Definition**: A decentralised network where devices communicate directly without a central server.
- **Advantages**:
    - Easy to set up with minimal hardware requirements.
    - Cost-effective for small networks.
    - No reliance on a central server, reducing single points of failure.
- **Disadvantages**:
    - Limited scalability due to performance degradation in larger networks.
    - Difficult to enforce security policies since there is no centralised control.
- **Example**: Home networks and small office file-sharing systems.

Client/Server Model

- **Definition**: A network where multiple client devices rely on a central server to manage resources, authentication, and data access.
- **Advantages**:
    - Centralised management improves security and data integrity.
    - Efficient resource distribution supports larger networks.
    - Easier data backup and access control.
- **Disadvantages**:
    - Requires dedicated server hardware and maintenance.
    - Higher cost compared to peer-to-peer models.
- **Example**: Corporate environments with centralised databases and application servers.

Thin Client Model

- **Definition**: A network where client devices rely on a central server for processing, storing, and running applications.
- **Advantages**:
    - Lower hardware costs as client devices have minimal processing power.
    - Enhanced security due to centralised data storage.
    - Easier software updates and maintenance.
- **Disadvantages**:
    - Heavy reliance on server performance and network connectivity.
    - Potential latency issues in high-demand environments.
- **Example**: Cloud-based virtual desktop infrastructure (VDI).

Trends in Networking

- **BYOD (Bring Your Own Device)**: Increases flexibility but introduces security risks.
- **IoT (Internet of Things)**: Requires robust network infrastructure to manage device communication.
- **Cloud Computing**: Enables remote data storage and access, reducing on-premises hardware needs.

Conclusion

Different network models suit different needs, and selecting the appropriate model depends on factors like cost, security, scalability, and network complexity. The client/server model is ideal for businesses needing centralised control, while peer-to-peer networks work well for small environments. Thin client networks are effective for cloud-based infrastructures requiring centralised processing.