Lab Practical #04: Installation of Network Simulator (Packet Tracer) and Implement different LAN topologies

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Aim/Objective

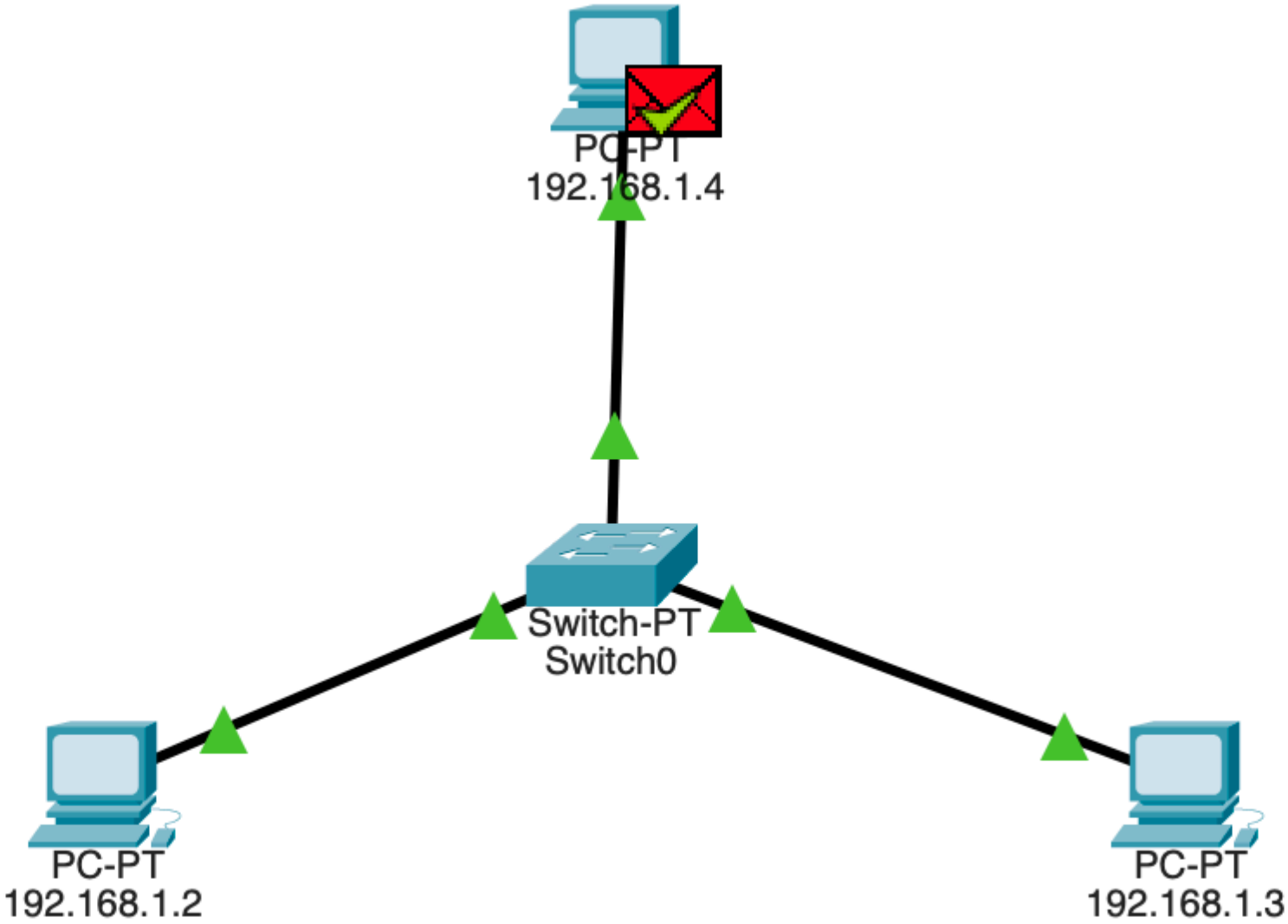
To install Network Simulator (Packet Tracer) and implement different LAN topologies. Check connectivity between devices using ping command or PDU utility.

Theory

Network topology refers to the arrangement of devices in a computer network. Each topology has specific characteristics and use cases in network design.

Procedure

1. Simple Network with Switch and PCs



Configuration:

- PC1: 192.168.1.10/24
- PC2: 192.168.1.11/24
- PC3: 192.168.1.12/24
- Switch: Catalyst 2960

Testing: Ping successful between all PCs.

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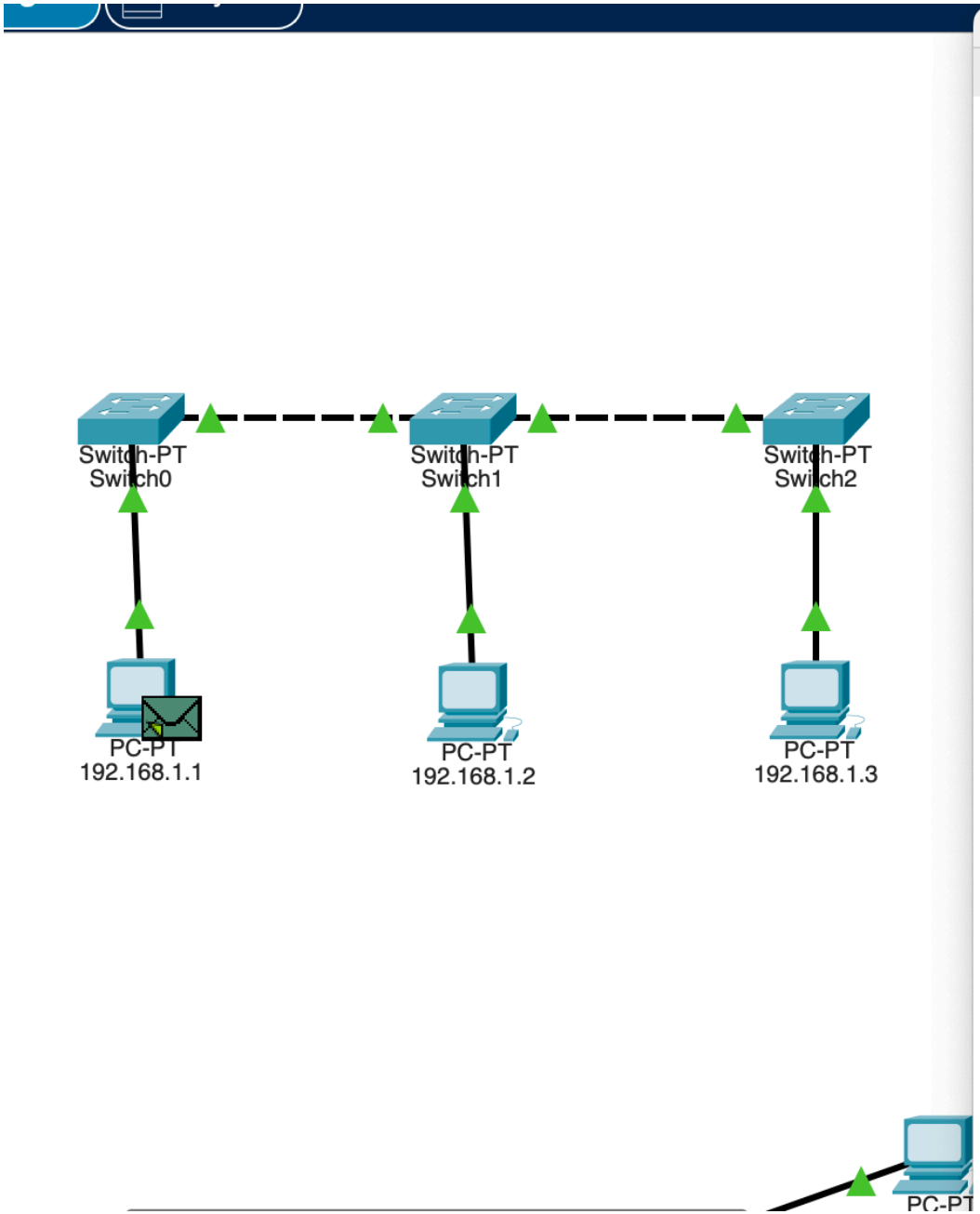
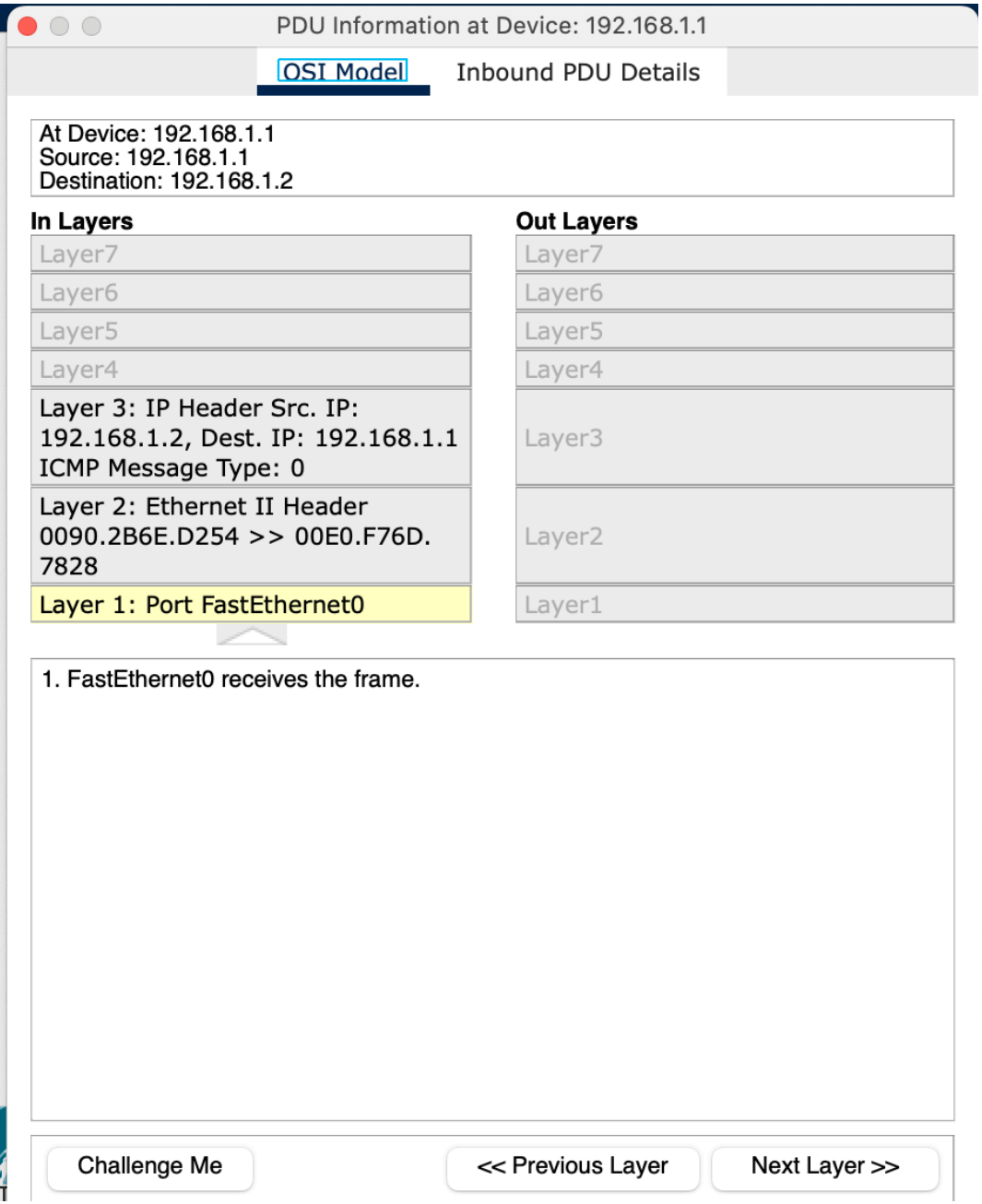
2. Bus Topology





Configuration:

- PC1: 192.168.2.10/24
- PC2: 192.168.2.11/24
- PC3: 192.168.2.12/24
- PC4: 192.168.2.13/24

Characteristics:

- Single backbone cable
- Cost-effective for small networks
- Single point of failure

Testing: PDU simulation successful along backbone.

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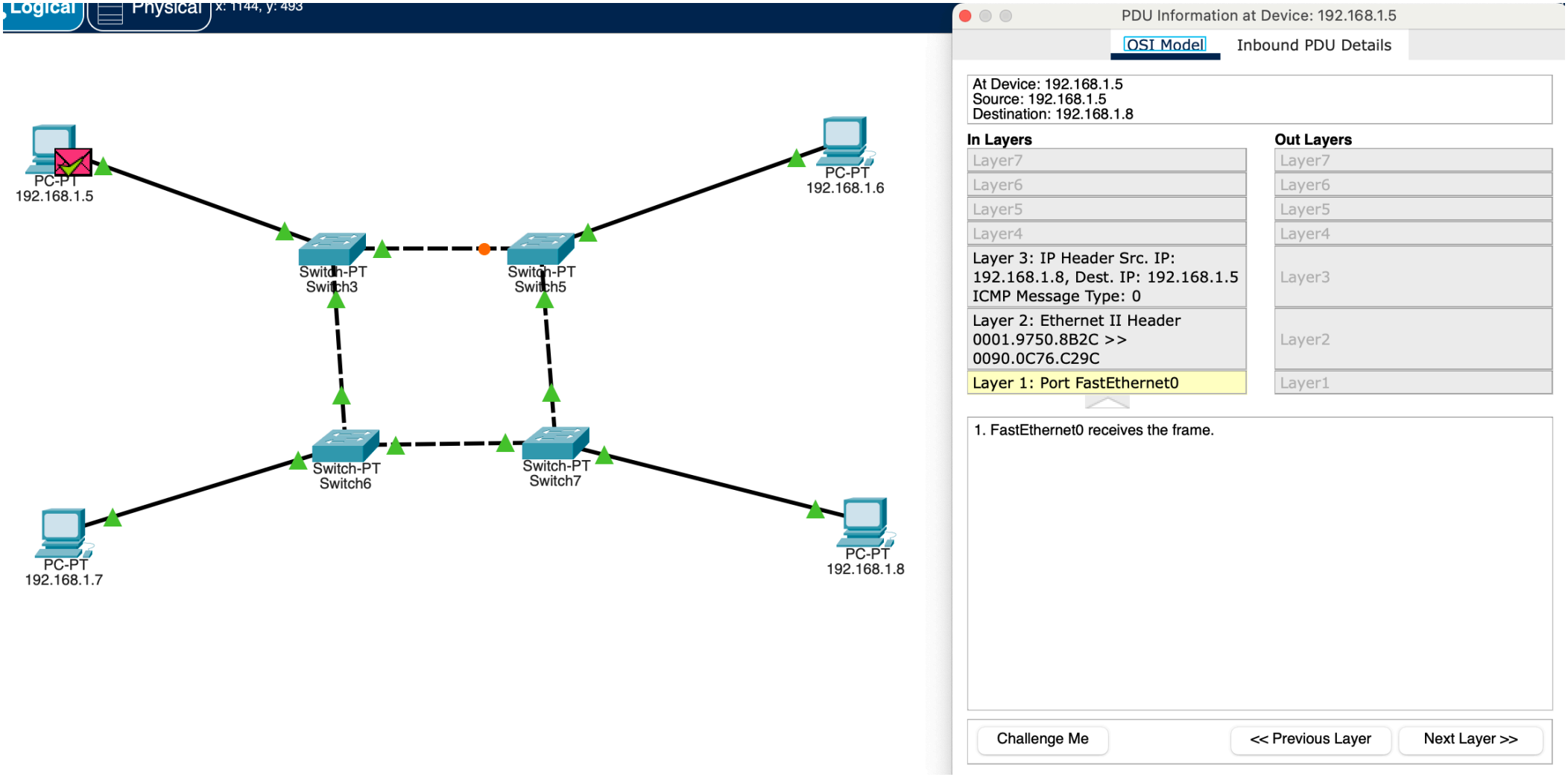
3. Ring Topology



Configuration:

- PC1: 192.168.3.10/24
- PC2: 192.168.3.11/24
- PC3: 192.168.3.12/24

- PC4: 192.168.3.13/24

Characteristics:

- Circular connection pattern
- Token passing mechanism
- Deterministic access

Testing: Token circulation verified.

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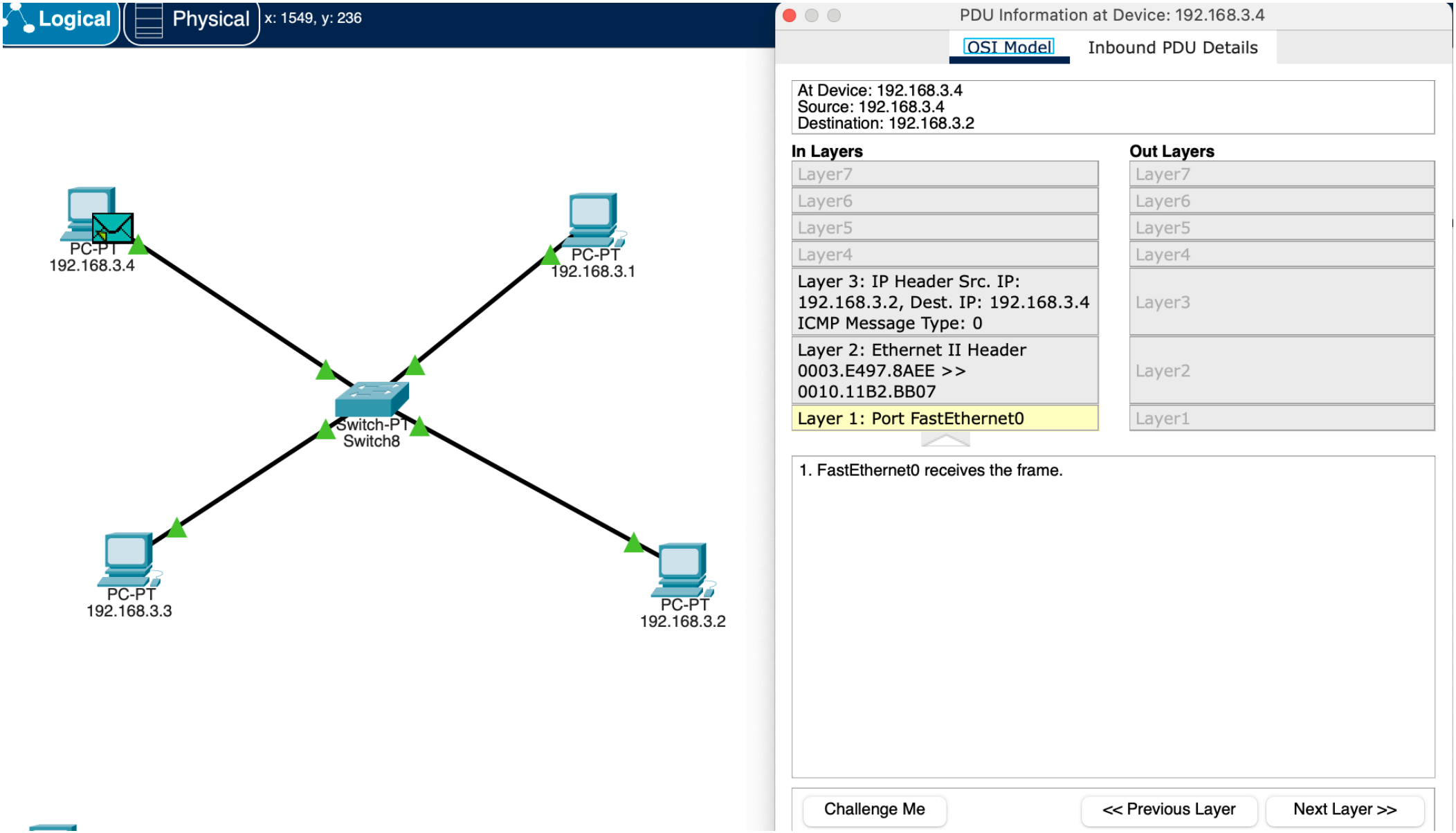
4. Star Topology



Configuration:

- PC1: 192.168.4.10/24
- PC2: 192.168.4.11/24
- PC3: 192.168.4.12/24
- PC4: 192.168.4.13/24

Characteristics:

- Central hub/switch
- Most common in LANs
- Easy troubleshooting

Testing: All pings successful.

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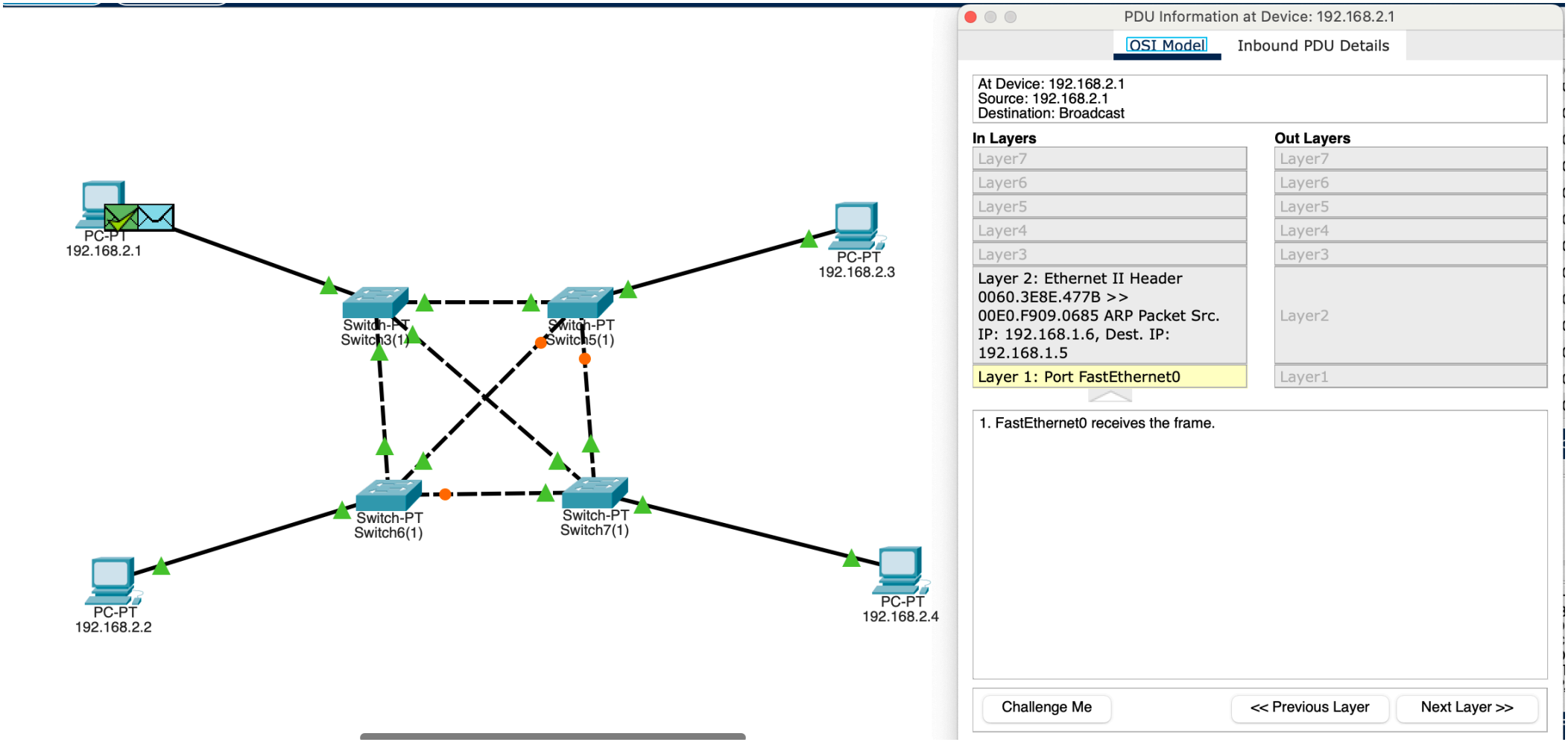
5. Mesh Topology



Configuration:

- PC1: 192.168.5.10/24
- PC2: 192.168.5.11/24
- PC3: 192.168.5.12/24
- PC4: 192.168.5.13/24

Characteristics:

- Every device connected to others
- Maximum redundancy
- High cost

Testing: Multiple paths verified.

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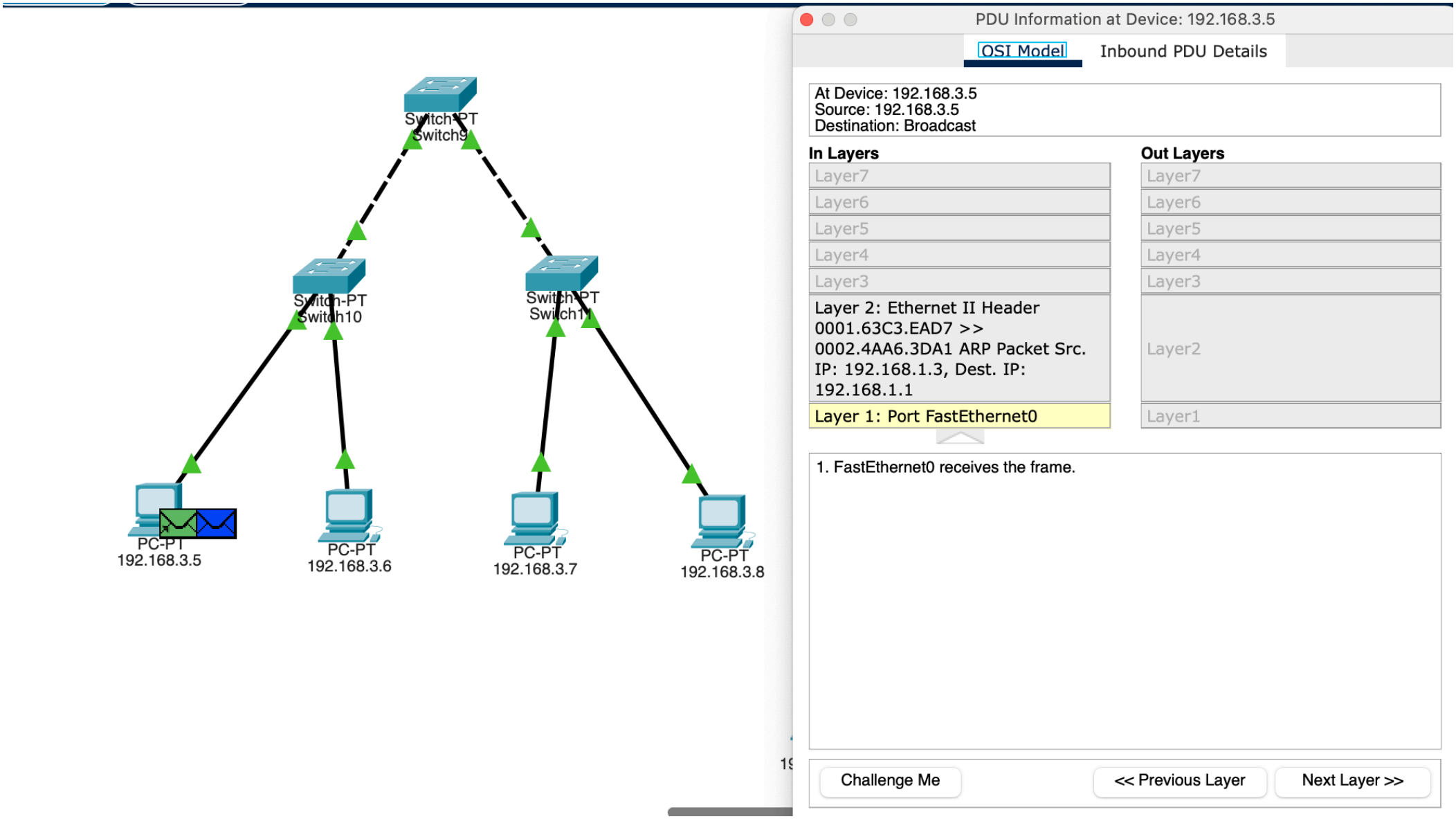
6. Tree Topology



Configuration:

- PC1-PC2: 192.168.6.10-11/24

- PC3-PC4: 192.168.6.12-13/24

Characteristics:

- Hierarchical structure
- Scalable design
- Combined star-bus features

Testing: Inter-branch communication successful.

Steps to Create Networks in Packet Tracer

1. **Launch Packet Tracer**
2. **Add Devices:** Drag PCs, switches from device panel
3. **Connect:** Use appropriate cables between devices
4. **Configure IPs:** PC → Desktop → IP Configuration
5. **Test:** Use ping command or PDU utility

Conclusion

Successfully implemented all LAN topologies in Packet Tracer. Each topology serves different network requirements based on cost, scalability, and fault tolerance needs.