

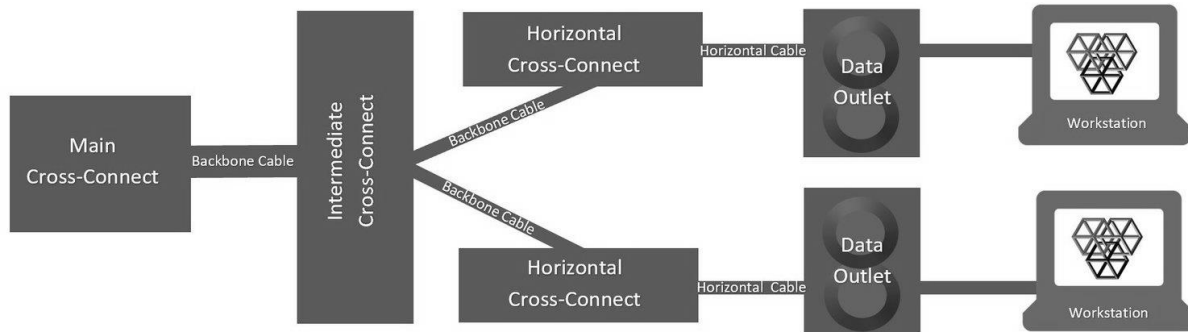


NETWORK TOPOLOGIES



Network topologies describe how network devices are connected together and how data is transmitted from one network point to another.

STRUCTURED CABLING TOPOLOGY



HORIZONTAL CABLING

runs both horizontally and vertically, conveying voice and data between a source and the end-user. Cable lengths between cross-connects are determined by the type of cable utilized, physical obstacles, data source and type and Prime Data Communications' commitment to providing our clients with secure and uninterrupted connectivity. At Prime Data, we install and service cable, networks, IT and Telecom – Nationwide. No sales. Just great service.

Cross-Connects facilitate connections to other elements in the system (and are also the location of cabling terminations).

- **Main Cross-Connect** | the transition point between entrance and backbone cabling
- **Intermediate Cross-Connect** | the transition point between backbone cabling (cabling that connects the equipment rooms and telecommunications rooms), Main and Horizontal (the cabling that connects telecommunications rooms to individual outlets or work areas)
- **Horizontal Cross-Connect** | the transition point between backbone (connected to equipment) and horizontal (connected to individual outlets and end-user equipment like workstations)

6

BASIC CABLING TOPOLOGIES



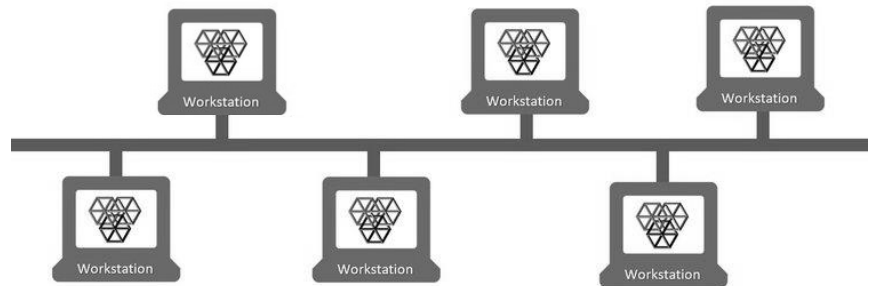
6 basic Topologies describe the physical and logical path of your network. That topology includes the placement of network devices, cable installation, transmission rates and signal type.

Topologies are found in local area networks (LAN), where each point in the LAN has one or more physical links to other devices in the network.

Graphical link-maps are known by the geometric shape they resemble: Bus, Ring, Star, Tree, Mesh, and Hybrids.

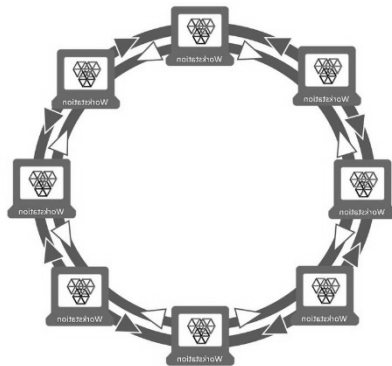
1. Bus Topology

Bus Topology | Like a bus-line, this topology is a simple and reliable way to configure a network. Data travels down an established route, making predictable stops along the way. On a Bus (or Line Topology), every device is connected to a single cable which runs from one end of the network to the other. If one station along the line fails, the bus can still run, as remaining stations can still communicate with each other. If the bus (hub/switch) or cable stops working, the result can be a failure of data-packet transmission to stations.



Bus networks, like city bus routes, are easy to expand and, in this simple network, faults are easily detected. If stations are scattered (and not along a common line), the Bus Topology will be prone to outages and failure as all data flows through one cable. This singular cable can also lead to more cabling for off-shoot workstations and network equipment, which can lead to slower network times. Though ideal for small networks, when work stations are scattered or larger networks involved we, at Prime Data, recommend another topology.

2. Ring Topology



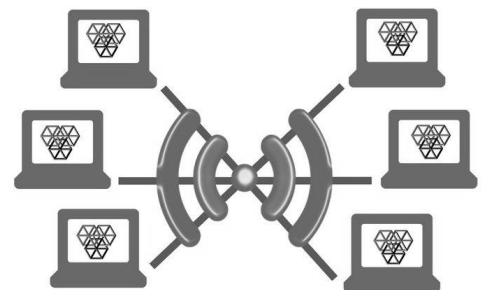
Ring Topology | Like good neighbors, this network relies primarily on the guy who lives to the right, and to the left of you. Each computer talks with two others on the block (or, circle, if you will). Sometimes, a bi-directional circle is created (as shown in the diagram); this allows data to run both to and from each neighbor (creating a Dual-Ring Topology). Ring Topologies can sustain large networks much more effectively than a bus. And, when bidirectional, can provide an extra layer of protection against failure; with dual-rings providing packet-backup if the first ring goes down.

Ring Topologies, while very affordable, come with the risk of catastrophic network failure; because one bad neighbor can spoil the neighborhood. Like a land-locked neighborhood, scalability has its limits in the Ring; to do repairs or make upgrades, the entire network must be shut-

down (major downtime). Like a great neighborhood, in the Ring, everyone needs to operate within agreed upon speed limits and power-grid limits - so that no work-station compromises the network as a whole.

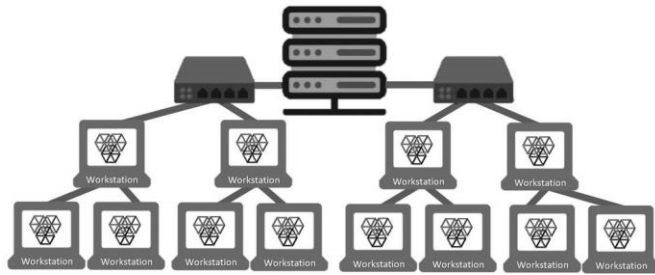
3. Star Topology

Star Topology | In this network configuration, every device is directly connected to the central point/server (responsible for managing data and transmission) and indirectly connected to every other point in the network. Network connections are made using a coaxial cable, twisted pair, or optical fiber cable.



The Star Topology is a big favorite for its cable conservation, and the fact that workstations can go down or be updated without having to take the whole network offline. While relatively safe from failure, server (or central node) health must be managed for reliability; adding tech cost to your bottom line. But, when weighing the cost of downtime to system-maintenance-costs, the benefits of utilizing a Star Topology often outweigh its financial burden for enterprise businesses.

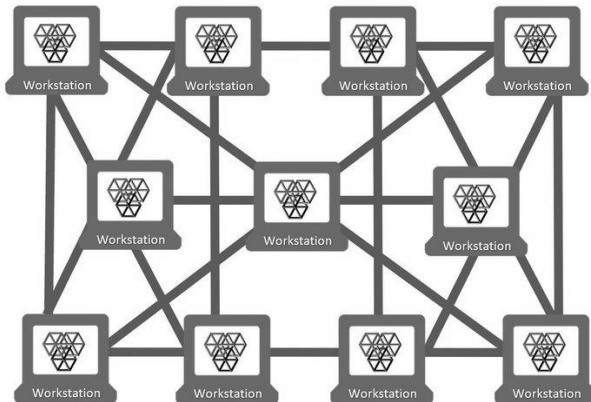
4. Tree Topology



Tree Topology | Yes, as the name implies, this network comes with roots and branches. But, here think family-tree. The Grands (servers) host the party for the extended family. Parent-child relationships abound and generally work well. In this Wide Area Network (WAN), lots of spread-out devices are connected and supported. New little devices are easily adopted, and new relationships are easily integrated.

Tree Topologies can be used to extend both Bus and Star Topologies as this format makes extended-family easier to understand and tend; the ability to spot performance issues is easier as each branch of the family can be viewed independently, making diagnosis and repair a more succinct process. As with any large family tree, knowing the lineage, age and capacity of equipment (with accurate site surveys) is key to working well together. A health Tree Topology requires a commitment to investing in maintenance; the central node/stack of servers is essential as the network's high function relies on this grand-parent device. Extensive cabling needs to be part of the plan as you connect devices throughout the hierarchy of a Tree Topology.

5. Mesh Topology

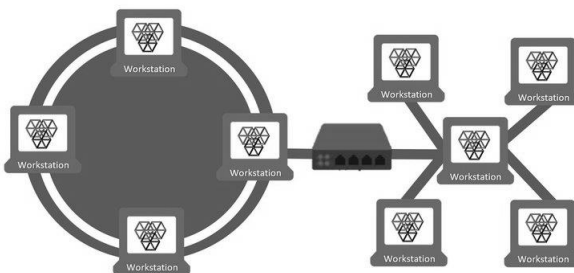


Mesh Topology | There are two forms of Mesh Topology; Partial Mesh Topology, where most stations are connected, to some or all other stations; and Full Mesh Topology, where every station is connected to every other device.

The inter-connectivity of the Mesh makes this type of network highly reliable and resistant to failure. While requiring an immense amount of configuration and cabling at deployment, this form of typology uses both routing (shortest distant for a data packet to travel) and flooding (all nodes within the network carry data), for double the coverage. As there

is no individual node or piece of equipment that can bring the entire system down, the Mesh Topology, is the least vulnerable when it comes to downtime and system compromise. The Mesh, a highly complex and secure system, ought to be well-planned, mapped and cabled by professionals like the Prime Data Communications Team.

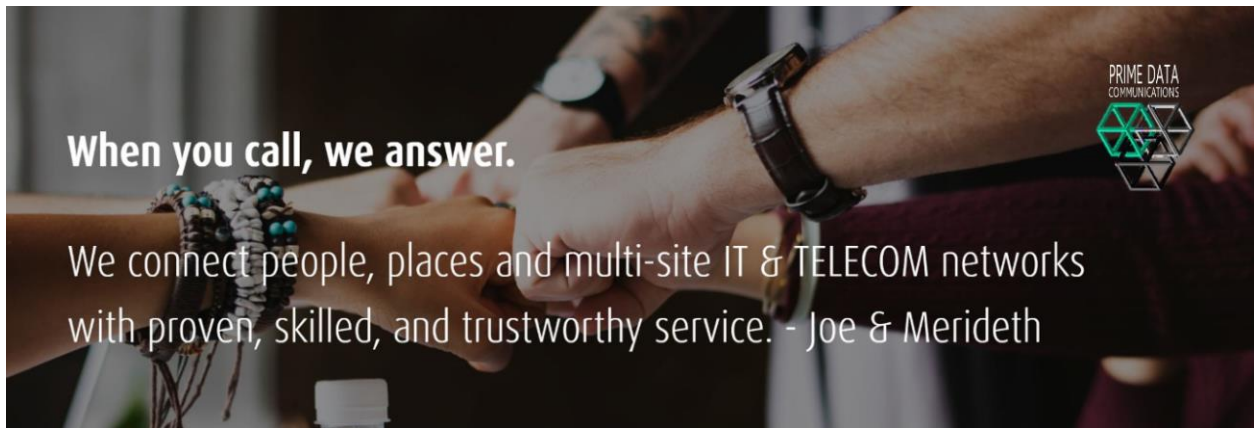
6. Hybrid Topology



Hybrid Topology | Larger Enterprises often find that a Hybrid Topology best meets their divergent needs; as it can allow them to build on what is, as they create their needed system of future.

Hybrids have all the advantages and vulnerabilities of their predecessor systems, so care must be taken to mitigate existing shortcomings (rather than pile on) and strengthen lines of stability. There are few constraints on what is possible with a Hybrid. As a result, Hybrids are

extremely scalable allowing for strategic and staged integrations and upgrades. Plan for strong and coherent structural cabling by professionals as well as a dedicated administrator with the capacity to manage multiple topologies, their challenges, integrations and updates.



When you call, we answer.



We connect people, places and multi-site IT & TELECOM networks with proven, skilled, and trustworthy service. - Joe & Merideth

When choosing a topology, consider the network that'll sustain your next great work.

- **Length of cable needed** | physical impediments and type of cable impact the length of run
- **Cable type** | twister pairs, coaxial or optical fiber cables each carry different levels of IT data and telecom signals
- **Cost** | the more complex the topology, the more costly
- **Scalability** | if you think you'll need to upscale your network, you'll want to choose an infrastructure that allows you to add nodes (points of entry) with minimal disruption.



Nationwide IT & Telecom Solutions
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Our Commitment

We are dedicated to providing enterprise-level businesses with the reliable service needed for installing, repairing, re-configuring, building out a current network or integrating multiple networks.

We bring decades of experience to knowing how to do it right. When you have our professional cable and telecom technicians work with your team, you have the added support you need to get done right the first time. And that means long-term savings.

Our goal is to keep your business networked and operational - so you have our word that when you reach out, one of our team will get back to you within the hour. You'll deal directly with a project manager because that's the way we do business. No call-center run-around; just real people, tackling big jobs, one at a time - and doing it right.

Because we don't sell products, you can trust that any suggestions we or one of our in sales). For us, it's all about great service.

Our commitment to you is responsive, qualified, timely telecom and IT support and service. We provide connectivity you can count on.

-Joe and Merideth Konkel, Owner-operators