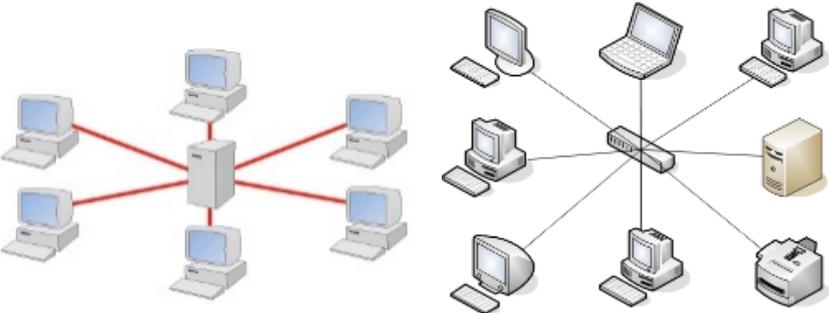


TOPIC: Network Topologies

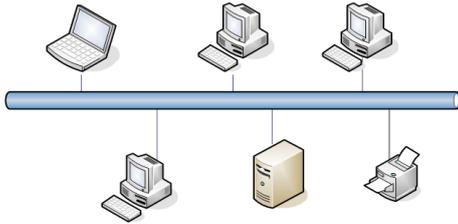
LEARNING OBJECTIVES:

- **Common network topologies: star, bus**
- **Advantages and disadvantages star topology**
- **Advantages and disadvantages of bus topology**

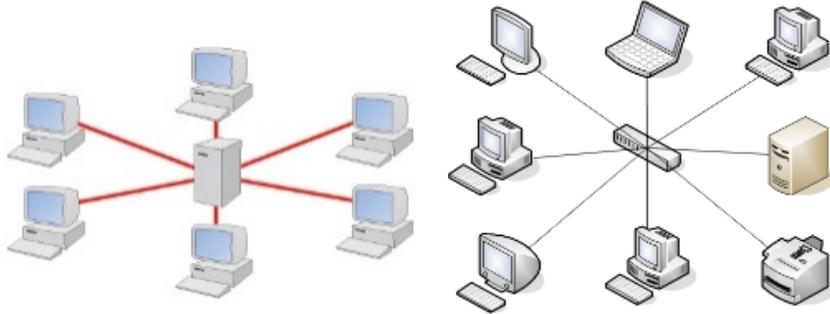
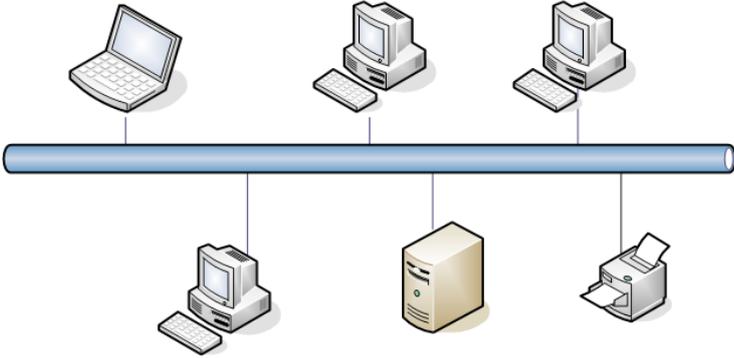
	Teacher Activity	Pupil Activity
<p>Starter activity (5-10 mins) [individual/ paired or group]</p>	<p><i>What is a computer network?</i></p> <p><i>What are the components in a computer network?</i></p> <ul style="list-style-type: none"> • Network Interface Card (NIC) • Cables • Bridge • Hub • Gateway • Switches • Wireless Access Points • Router 	<p>Discuss (individual/paired or group)</p> <p>Note down as many components in a computer network</p> <p>Definitions for:</p> <ul style="list-style-type: none"> • <i>Network Interface Card (NIC)</i> • <i>Cables</i> • <i>Bridge</i> • <i>Hub</i> • <i>Gateway</i> • <i>Switches</i> • <i>Wireless Access Points</i> • <i>Router</i> <p>Have a vote or hold up a card / small whiteboard that matches the term to the definition</p>

<p>Main activity one (15 mins)</p>	<p>Students should be able to draw topology diagrams and explain the differences between the two topologies. They should also be able to select the most appropriate topology for a given scenario.</p> <p>What is a STAR topology?</p> <p>A STAR topology is a way of arranging your LAN (local area network), it is one of the most common network setups.</p>  <p>What are the advantages and disadvantages of a STAR topology?</p> <p>Advantages:</p> <ol style="list-style-type: none"> 1. The main advantage that contributes to star being the most commonly used network topology is that if one host goes down, it does not affect the others. 2. It also means the network can be managed through the central hub. 3. It's easy to add or remove hosts from the network. <p>Disadvantages:</p> <ol style="list-style-type: none"> 1. The central network device determines the performance and number of nodes the network can handle. 2. If the central network device fails the whole network goes down and no one can access the network. 3. Can be more costly. 	<p>Class discussion (individual/paired or group) or</p> <p>Use a small whiteboard and show the diagrams and describe:</p> <p>Try and represent a star topology with a diagram</p> <p>Note the advantages of a star topology</p> <p>Note the disadvantages of a star topology</p> <p>Have cards to match up 'what is it used for?' and 'what types of programs / devices use it?' for the Star network</p> <p>Create cards to categorise advantages and disadvantages</p>
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<p>Plenary one (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <ul style="list-style-type: none"><i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i>	<p>For example:</p> <ul style="list-style-type: none">5 minute timed writing exercise on what has been learned so farFill in class notesHave a discussionAnswer open questionsAnswer directed questions
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<p>Main activity two (15 mins)</p>	<p>What is a BUS topology?</p> <p><i>A bus topology (or network design) is a simple, but very common network style that you would find in most organisations. This style network doesn't rely on a central device and can continue to operate if a device fails or removed from the network.</i></p> <p>What is it used for?</p> <p><i>This will be used for networks that require multiple users to have access to a single resource, such as a printer. A single printer can then prioritise incoming print requests and action them. There is no priority from device order (i.e. 1-6), only request input time order.</i></p> <p>What types of programs/ devices use it?</p> <p><i>Every single device that would want to have access to resources would require to use this style network; that is if the resource isn't wireless.</i></p> <p style="text-align: center;">BUS Topology</p>  <p>What are the advantages and disadvantages of a BUS topology?</p> <p>Advantages:</p> <ol style="list-style-type: none"> 1) All devices have access to each other 2) If one device fails/ is removed from the network, the other devices can still communicate 3) Very simple to set up 4) Optimised for LAN 5) Uses less cable than a star network (traditionally) <p>Disadvantages:</p> <ol style="list-style-type: none"> 1) Dependant on central cable, if tampered with, entire network goes down 2) Limit to how many devices can be connected. Limited by the bandwidth of the central cable 3) Low security because each device receives the same signal 4) Not designed for networks with heavy work loads 5) Difficult to identify a fault along a cable 6) Expensive to replace central cable once network has been implemented because the network has to be taken down for maintenance 	<p>Class discussion (individual/paired or group)</p> <p>or</p> <p>Use a small whiteboard and show the diagrams and describe:</p> <p>Try and represent a bus topology with a diagram</p> <p>Note the advantages of a bus topology</p> <p>Note the disadvantages of a bus topology</p> <p>Have cards to match up 'what is it used for?' and 'what types of programs / devices use it?' for the Bus network</p> <p>Create cards to categorise advantages and disadvantages</p>
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<p>Plenary two (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <p><i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i></p>	<p>For example:</p> <ul style="list-style-type: none"> • 5 minute timed writing exercise on what has been learned so far • Fill in class notes • Have a discussion • Answer open questions • Answer directed questions
<p>Homework (optional)</p>	<p><i>Teacher choice based on homework policy of school.</i></p>	<p>For example:</p> <p>Write down the components in a computer network and their meanings</p> <p>Ensure all diagrams are correctly labelled.</p> <p>Find details about a Ring Network; create a diagram; label the diagram; Note the advantages and disadvantages</p>

Key Terms: Network Topologies	
<p>STAR</p> <p>Network</p> <p>Topology</p>	<p>A STAR topology is a way of arranging your LAN (local area network), it is one of the most common network setups.</p> 
<p>BUS</p> <p>Network</p> <p>Topology</p>	<p>A bus topology (or network design) is a simple, but very common network style that you would find in most organisations. This style network doesn't rely on a central device and can continue to operate if a device fails or removed from the network.</p> <p>What is it used for?</p> <p>This will be used for networks that require multiple users to have access to a single resource, such as a printer. A single printer can then prioritise incoming print requests and action them. There is no priority from device order (i.e. 1-6), only request input time order.</p> <p>What types of programs/ devices use it?</p> <p style="text-align: center;">BUS Topology</p>  <p>Every single device that would want to have access to resources would require to use this style network; that is if the resource isn't wireless</p>