



PROGRESS OUTCOME 5

# Expanding the farm computer network

## Context

The school farm has been operating with a very basic computer in the shearing shed (see Snapshot 3). The farm manager now wishes to build a new computer network with:

- the capacity to print out data in a room not accessible to students
- a connection to the Internet
- two more computers with student access to the Internet
- managed access for selected student-owned devices.

The computer is in working order with a Linux®-based operating system and Open Office software. The farm has a networked connection.

In consultation with the farm manager and the school network manager, Georgia has been given access to computer equipment no longer needed by the school.



## Insight 1: Designing the solution

I sketched out a plan of the components, hardware, and software I would need to create a working network and how the devices would need to connect with each other. I discussed this with the network manager and farm manager.

I identified the need for a Wi-Fi-capable router connected to a switch that would connect the main computer with the other two student machines.

As students would also be accessing the network from their own devices, I needed to consider safe use. I researched the parts and components I would need. With guidance from the network manager, I plotted a simple network architecture diagram with possible subnet and gateway arrangements.



## Insight 2: Configuring the network components

I decided that the best way of allowing students to connect to the Internet would be through configuring access control on a Wi-Fi-capable router. I configured access to the network for the three computers on an Ethernet 4-port, Wi-Fi-enabled router. I set the name field and configured the speed duplex to '100 Mbps full duplex'. I set the layer 2 switching on and enabled lock access.

I also configured QoS (Quality of Service) priority for the port settings in the QoS list. I configured the IP addresses of the machines and pinged them to confirm connectivity. (I'd set up a DHCP server as I'd decided to use dynamic rather than static addressing.)



## Insight 3: Configuring peripherals and student devices

I researched printing options and decided that I would need to set up a shared printer to allow printing from the farm manager's desktop computer.

For students using their own devices, I configured the router to allow 'all connections', because the school network connection already filters the Internet and requires a sign-in.



## Insight 4: Testing

From feedback from the boarding hostel supervisor, I discovered that I needed to block boarders from bypassing the hostel network and connecting to the Internet via the farm network when they were not supposed to. I decided to record the MAC (media access control) addresses and block all connections outside normal class hours other than those selected to access the farm network manager's computer.

I had a problem connecting one of the student computers to the Internet when I had the network set up – the message was that there was a DNS error. I pinged the network and could not find the host, so I checked the host's file and the DNS settings. I flushed the DNS cache, and the problem was resolved. I determined that I must have had a bad result cached.



## Insight 5: Confirming fitness-for-purpose

Once the network was up and running and tested, I decided to review the network to ensure that, once I left school, it would continue to work and be able to be maintained.

In discussions with the network manager, I explained that I'd used a 4-port Wi-Fi router because it was the only one I could access that could be configured and restricted. If the network grows, it can easily be replaced and more computers added and configured quickly.

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