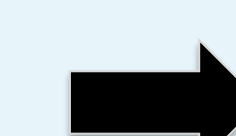


Stages of the project:

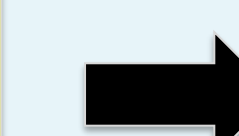
Literature review



Methodology



Design &
Implementation



Results and future
recommendations

Introduction

- Brackla primary school have run out of IP addresses resulting in devices having to be turned off so that others can be used.
- All staff and pupil devices in the network are in one VLAN, causing broadcast traffic issues.
- These problems need to be resolved in the network upgrade along with other implementations to better the network

Aim:

Design and implement a network upgrade for Brackla primary school

Objectives:

- Design VLANs and subnets for wired and wireless network across school
- Configure DHCP server for allocation of IP addresses
- Improve network security
- Improve network performance
- Implement new web filtering system
- Configure firewall policies so that the firewall is working on the new network
- Improve consumer satisfaction

Literature review summary

Thorough research was carried out on VLANs, DHCP spoofing, network upgrades, IPv6 vs IPv4, network security, broadcast traffic issues, 802.1x dynamic VLAN assignment and security in IoT devices.

Design and implementation

Designs:

- VLAN design
- AP and switch locations in Brackla primary school

Design decisions:

- Cisco vs Aruba network hardware
- Which school to upgrade
- IPv4 vs IPv6

Implementation

- 7 new VLANs were implemented to the network to resolve broadcast traffic issues the school were experiencing and to make for easier management of the network
- XX.XX.64.0 /20 given to the school providing them with 2048 new IP addresses allowing them plenty of room for future upgrades
- Next generation firewall configured to monitor the network, flagging any suspicious activity from users and inspecting every packet for anything malicious. The firewall also enforces different web filtering policies for staff and pupils

Switch configuration:

- VLANs
- Switch stacking
- Spanning tree protocol
- Configuring server monitor and monitor bandwidth usage

Hardware replaced:

- 6 switches replaced
- 20 APs replaced, 4 external APs and 8 new APs installed

Other configuration:

- DHCP server with failover
- APs

Methodology

Mendelow's matrix was used to assist in recognising stakeholders and identify their power and interest. This was used to select who would be suitable to answer interview questions and who to send the questionnaire to

High power, low interest	High power, high interest
Teachers	Head teacher IT engineer Network analyst
Low power, low interest	Low power, high interest
Parents Pupils	IT co-ordinator

Results

The network upgrade was a success as all objectives were met, resulting in the aim being achieved. This was validated by key stakeholders deeming the project a success

Future recommendations

- 802.1X Dynamic VLAN assignment
- Port security
- DHCP snooping
- IPv6