

**ES8.**

## **DESIGN OF THE CAMPUS NETWORK FOR UNIVERSITY OF PERADENIYA**

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The University of Peradeniya campus network is the largest fiber optic computer network to be established in the country. It is a hierarchical network design based on the multi-layer campus network model having three layers: access layer, distribution layer and the core layer. The technology used for the network is Fast Ethernet/Ethernet with provisions for future upgrades to Gigabit Ethernet. Network switches are used at the core and distribution layers while the access layer uses switches for about 95% of the nodes and shared hubs for the rest. Supported protocols on the network include IP and IPX. Fiber optic cables are used in the links at the core and distribution layers while fiber-optic and copper unshielded twisted pair (UTP) cables are used at the access layer.

The access layer, which is at the bottom of the hierarchy consists of the department and building level networks at the various locations within the campus. Layer 2 switches and shared hubs located in the individual buildings and floors and UTP cabling is used to interconnect over 1500 network nodes. In multi-storied and large buildings where it is necessary to use more than one switch, the switches are interconnected using fiber-optic cable. All access layer switches are Ethernet (10Mbps) switches with Fast Ethernet (100Mbps) uplinks.

The distribution layer of the campus network includes the inter-building networks of the faculties of Engineering and Science, Main Library building and the Senate building. Layer 3 Fast Ethernet switches are used for the Engineering and Science faculty networks while Layer 2 Ethernet switches are used elsewhere. Fiber-optic cables are used for interconnections in this layer.

The core layer of the campus network consists of a Layer 3 Fast Ethernet switch. The core switch interconnects the distribution layer networks at the faculties of Engineering, Science, Arts, Medicine, Agriculture and Veterinary Science, Dental Science as well as the Senate Building and the Main Library building. The core switch also has a separate link to the common campus network resources in the server farm physically located in the Faculty of Engineering. The server farm includes common campus network resources such as Electronic Mail servers, World Wide Web servers, network management stations, access router connecting the campus network link to the Internet via LEARN (Lanka Educational and Research Network), and the dial-in router which provides access to the campus network through telephone lines.

The interconnection medium used in the core layer is fiber-optic cable. Combination cables of Single-mode and Multi-mode optical fiber is used for all locations. Although multi-mode fibers would be sufficient for Fast Ethernet connections to the faculties of Engineering, Science, Agriculture and Veterinary Medicine, Medicine and Dental Sciences, single-mode fibers will be used make future upgrades to Gigabit Ethernet possible.

The use of network switches at all the three layers also make it possible to use the Virtual LAN (VLAN) technology to provide location-independent LANs, improved network security and manageability.

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