

SWITCH CONFIGURATION AND REASONING

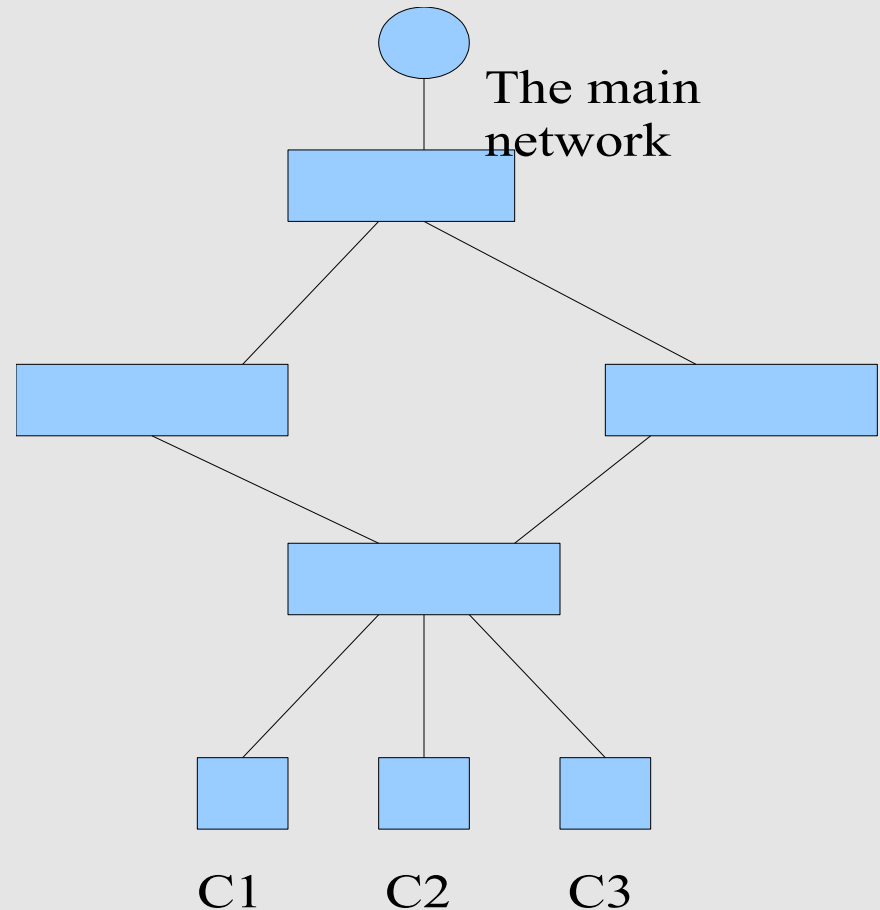
Featuring CABLETRON
Switches Within EECS

WHAT IS A SWITCH?

- Functions at layer 2
- Creates virtual networks
- Reduces network congestion
- Remotely manageable (usually)

Hubs, Switches or Routers?

- Hubs – Won't work.
- Routers – Expensive
- Switches – Just Right?



FIRST MENU

- DEVICE CONFIGURATION MENU
- DEVICE STATISTICS MENU
- NETWORK TOOLS
- SECURITY

NETWORK TOOLS

- Some Built in commands :
- arp defroute
- netstat ping
- show traceroute
- telnet arp_learn
- reset soft_reset
- exit

DEVICE CONFIGURATION

- GENERAL CONFIGURATION
- SNMP CONFIGURATION MENU
- SYSTEM RESOURCES INFORMATION
- FLASH DOWNLOAD CONFIGURATION
- PORT CONFIGURATION MENU
- 802.1 CONFIGURATION MENU
- LAYER 3 EXTENSIONS MENU

GENERAL CONFIGURATION

- MAC Address: 00-E0-63-A5-91-A4
- IP Address: 132.235.1.29
- Subnet Mask: 255.255.255.0
- Default Gateway: NONE DEFINED
- TFTP Gateway IP Addr: 0.0.0.0

GENERAL CONFIGURATION 2

- Device Date: 03/04/2008
- Device Time: 15:45:44
- Screen Refresh Time: 03 sec
- Screen Lockout Time: 15 min
- Device Uptime: 62 D 0 H 31 M
- Module Name: sysName

GENERAL CONFIGURATION 3

- Com: [ENABLED] Application: [LM]
- Clear NVRAM: [NO]
- WebView: [DISABLED]
- Telnet: [ENABLED]
- Agg Mode:[SMARTTRUNKING]

SNMP CONFIGURATION - COMMUNITY NAMES

- Community Name Access Policy
-
- ***** read-only
- ***** read-write
- ***** super-user

SNMP CONFIGURATION - TRAP CONFIGURATION

- What are traps?
- You must define:
 - Trap Destination
 - Trap itself

SNMP CONFIGURATION - Access Control

- Access Control Lists: [ENABLED]
-
- IP Addr Mask
- 127.0.0.1 255.255.255.255

SYSTEM RESOURCES

- CPU Type : i960 HD 33MHz
- Flash Memory Installed: 8 MB
- Available: 6851548 Bytes
- DRAM Installed: 20 MB
- Available: 4510547 Bytes
- NVRAM Installed: 341 KB
- Available: 335203 Bytes
- Current Switch Utilization: 0 %
- Peak Switch Utilization: 100 %
- Reset Peak Switch Utilization: [NO]

FLASH DOWNLOAD

- Download Method: [RUNTIME]
- Reboot After Download: [YES]
- TFTP Gateway IP Addr: 0.0.0.0
- Download Server IP: 132.235.1.17
- Download File Name: 2h252/50409.flc
- Last Image Server IP: 132.235.1.17
- Last Image File Name: 2h252/50409.flc
- Transfer Status: Transfer Successful

PORT CONFIGURATION - Ethernet Interface Config

-
-
-
-
-
-

Intf	Port	PortType	Link	Speed	Duplex	Config	F/H	DX	FC
8	1	RJ45-100TX	No Link	NA	NA	AutoNeg	Off		On
9	1	RJ45-100TX	Link	100	Full	Manual	Sym		On
10	1	RJ45-100TX	Link	100	Full	Manual	Sym		On
25	1	FE100-FX	Link	100	Full	Manual	Sym		On
26	1	FE100-FX	No Link	100	Half	Manual	Sym		On

PORT CONFIGURATION - Port Redirection Config

- You must specify:
 - Source Port
 - Destination Port
 - Frame Format (Tagged, untagged, normal)
 - Redirect Errors

PORT CONFIGURATION - SmartTrunking Config.

- You must specify:
 - Group number
 - Group name
 - Ports to be trunked
 - If Trunk Protocol is enabled

802.1 CONFIGURATION

Spanning Tree

- Looks at all switches connected together into one network “fabric”
- Allows logical loops in the network
- Redirects packets around failed links
- Learns shortest paths for undirected broadcasts

802.1 Configuration

VLAN

- VLANs are Virtual LANs
- VLAN number is part of the ethernet header
- VLAN field only exists if VLANS are being used, and the packet is part of a VLAN
- VLANs may exist across multiple switches, IP subnets, and buildings
- Can be controlled on a port basis

802.1 VLAN PACKET

WIRESHARK FRAME OUTPUT

Frame 963 (1358 bytes on wire, 1358 bytes captured)

Ethernet II, Src: 00:07:b3:74:66:40 (00:07:b3:74:66:40), Dst: 00:15:17:16:94:d2 (00:15:17:16:94:d2)

802.1Q Virtual LAN, PRI: 0, CFI: 0, ID: 510

000. = Priority: 0

...0 = CFI: 0

.... 0001 1111 1110 = ID: 510

Type: IP (0x0800)

Internet Protocol, Src: 8.12.216.125 (8.12.216.125), Dst: 132.235.16.47 (132.235.16.47)

Transmission Control Protocol, Src Port: 80 (80), Dst Port: 61803 (61803), Seq: 51521, Ack: 1, Len: 1288

Hypertext Transfer Protocol

802.1 VLAN PACKET

ETHERNET PACKET FORMAT

Destination MAC address	Source MAC address	Ether Type	User Data
----- 6 -----	----- 6 -----	-----2-----	-remainder

ETHERNET VLAN PACKET FORMAT

Destination MAC address	Source MAC address	Type (VLAN: 0x8100)	VLAN Tag	Ether Type	User Data
----- 6 -----	----- 6 -----	----- 2 -----	----- 4 -----	----- 2 -----	-remainder

The VLAN tag itself will look like this (length in bits):

Priority – 3 bits, 0-7

CFI – Canonical Format Identifier - bit

0 – Ethernet Switch

1 - Token Ring

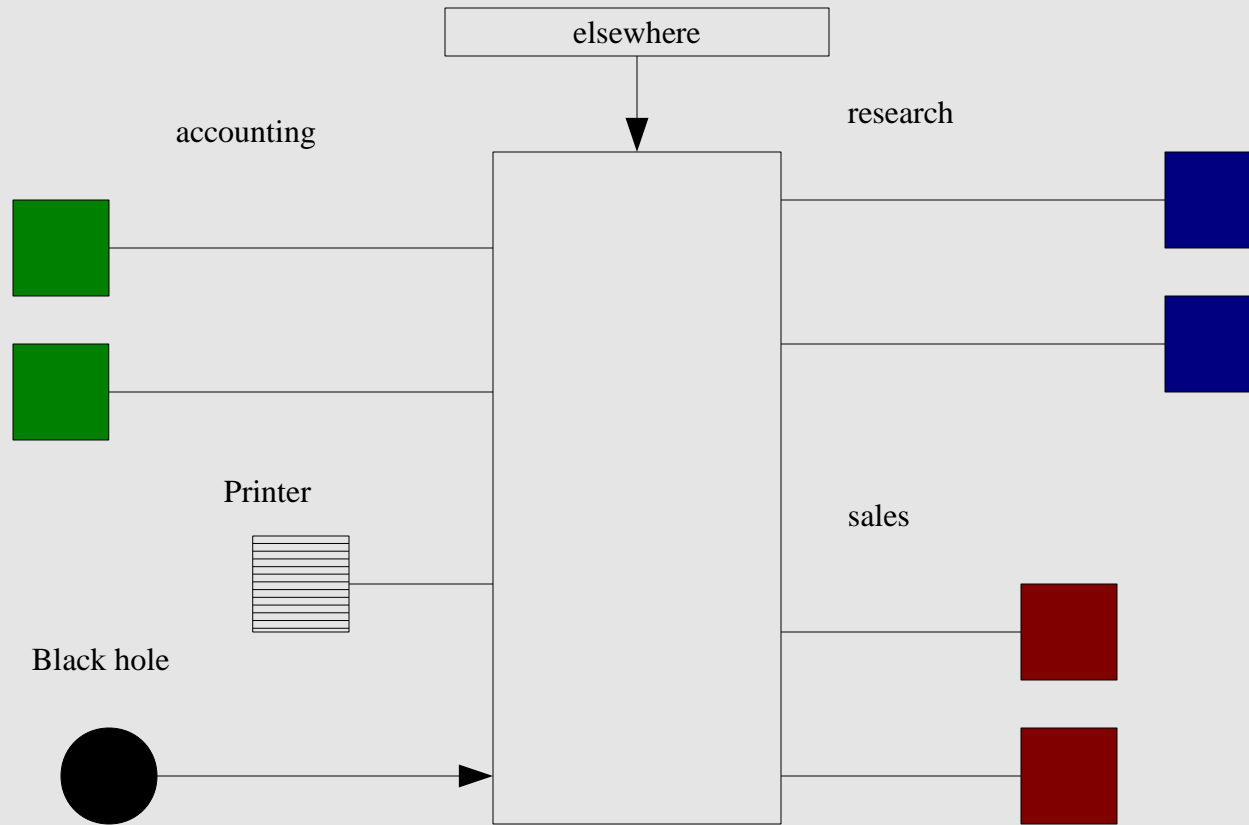
ID – Vlan ID – 12 bits

0 = no vlan assigned

FFF = reserved

Ethernet Type/Length – 16 bits

Sample Vlan Assignments



- The black lined area is green+red+blue

802.1 Configuration Priority

- Assigned by switch port
- Assigned by packet type (IP, IPX, DecNet)
- Assigned by IP-address
- Assigned by IP-port

802.1 Configuration

Rate Limiting

- Fairness of use
- Ability to reach the switch

SECURITY

- PASSWORDS
- MAC address (by port)
- Machine by Password
- RADIUS