CLSC Cheat Sheet

Switch & Router

7500 –

configure interfaces by: Interface *type slot/port-adapter/port*
7500 has an integrated RSP which uses route caching to remember which port(s) a packet should be forwarded to.

5000 & 5500 –

5500 has full supervisor redundancy with a Supervisor II installed.
Leds flash during startup and turn green once initialization is complete
An orange light can indicate a problem on some modules

3000 --

SYSREQ during boot to clear password
The password must be different for the switch and the stack
7 slots for modules
40mbs to 700mbps

2820 –

Two high speed expansion slots
Supports shared memory architecture with a 3mb packet buffer

1912 –

12 ports

Module notes:

Supervisor II supports 2 100mb links, has ansynchronous port which uses a straight through cable to DCE, DCE is DB25
the supervisor engine contains the network management process
the supervsior engine is the main system process in the switch

Process types

RSP - Route Switch Processor: handles all traffic on back plane
VIP - versatile interface processor: takes load off main RSP, You can have multiple VIP cards in a single router to improve performance.
SAMBA: provides arbitration to the switching bus among ports and among lines, it resides on the line modules and the supervisor engine.
NMP - Network Management Processor: governs the general control of the hardware, its config and diagnostic routines:
EARL –Enhanced Address Recognition Logic: similar to the function of a learning bridge or content addressable memory
Mcp - primarily communicates information between nmp and the line module communication processors distributed on the catalyst 5000 line modules
Phoenix – Found on the supervisor III engine and is a gigabit bridge used to create the crossbar fabric

<u>Switching types</u>
Fast switching: used by default, The first packet is copied into packet memory and the destination network or host is found in the fast-switching cache. The interface processor computes the CRC

        Enabled using command: ip route-cache

Netflow: provides accounting and network analysis

        Uses: source & destination ip address, source & destination port numbers, and type of service

Process Switching: slowest because it does not use a route cache. To enable process switching use the command "no *protocol* route-cache

        Received packets are copied into the system buffer then the router looks up the layer 3 network address in the routing table and initializes the fast-switch cache.. The RSP computes the CRC.

Distributed Switching: requires a second generation VIP line cards. To enable distributed switching use the command "*protocol* route-cache distributed"

        Switching occurs on the VIP which maintains a copy of the routing cache, switch performance improves linearly with the number of VIP cards installed.

Optimum Switching: Enabled by default on a 7500. Similar to fast switching, however it must be disabled for debugging

<u>Queuing Types</u>
FIFO Queuing – packets leave in the order they arrived.
Weighted Fair Queuing – default for all interfaces slower than 2.048mb, : Each session is assigned a weight, the higher the weight the lower the priority.
Priority Queuing: Allocates a percentage of bandwidth for a specified traffic by creating protocol queue lists and custom queue lists.
Custom Queuing: Packets are forwarded based on an assigned priority. The administrator must create priority lists and groups to define rules for assigning packets to a priority queue

<u>Protocols</u>
VTP - VLAN Trunking Protocol: used for automatically grouping VLAN trunk ports between switches.

        To Enable a VTP management domain: Set vtp

        Vtp information can be distributed to all stations throughout the network including servers, routers, and switches that participate as a vlan configurator

        VTP provides auto intelligence for configuring switches across the network

802.10 – IEEE VLAN protocol: VLAN ID is a required field in the header, The 802.10 header includes clear header & protected header, the 6 byte said allows for 4.29 billion distinct lans, the 802.10 said field is used as a vlan id

<u>Management Types</u>
In band: telnet, snmp (through network)
Out of band: asynchronous port, modem, console

        RMON: Remote Monitoring, four types/groups: statistics, history, alarms and events.

        SPAN Switched Port Analyzer: is a subset of RMON and is used to mirror traffic to a remote segment.

<u>Concepts</u>
Queueing: Used for video conferencing, and bursty traffic
Half duplex is like a one way bridge.
Frame Tagging: Frame tagging assigns a unique user id to each frame. With Frame Tagging a unique identifier is placed in each frame as it is forwarded through the switching fabric

VLAN Virtual Lan:

        Command to setup: Set vlan number slot/port

Switching Types:
        Cut through – begins forwarding after receiving a small portion of the frame, has the chance of forwarding collisions through the switch.
        Cut through with fast fragment – same as cut through, but if high errors occur it switches to store and forward until the error rate reduces.
        Store and forward - In store and forward switching the switch receives the full frame before beginning to transmit it. Latency through the switch varies with frame length

Switch Applications: Server Cluster, 10/100 mbps workgroup
Switch parameters can be erased using the set or erase commands.
Multimode transceiver has a maximum distance of 1.2 miles (2 kilometers), Source is a led
Lane Single Mode Fiber – the optical source is a laser, the maximum span is 10km

ATM –
Address Types: ICD, DCC

APART - automatic packet recognition and translation, Disabling apart increases throughput however only default translations are used, After disabling apart earl continues to provide packet forwarding**.**

Flow of a frame through a Catalyst 5000 series switch
        Ethernet port receives buffer, checks FCS
        SAINT ASIC ports request to bus arbiter to transfer frame
        bus arbiter issues a grant which signals SAINT ASIC to initate data transfer
        A frame is transferred across switch backplane

ATM LANE (ATM LAN Emulation)
the bus is responsible for handling both broadcasts and multicast
the les manages the stations that make up the elan
BUS & LES Transaction Order:
        Client A intiates Data direct VCC to B
        Client A sends a LE-ARP to LES
        Bus forwards intial data frames to B

CCDP Concepts which appear on the CLSC exam:
Demand nodes should always be placed as close as possible to their resource nodes
Demand nodes include client applications and terminal services
Network traffic occurs primarily between demand and resource nodes
Local resources should be placed nearest to those users which need them the most
Local resources should be on their own dedicated segment to enable full 100mbps throughput
Remote conversation takes place between a demand node and resource node located in different collision domains
The measurement of throughput in a remote conversation is determined by the amount of transactions which can take place
If you have 3 demand segments accessing 1 resource segment it is the same as having them all in the same collision domain.

*Other stuff:
The RMON mib supports 4 groups which are statistics, history, alarms and event group. SPAN (Switched Port Analzyer) lets you monitor traffic from across a VLAN to a single port for analysis. Rmon solutions such as vlan director, traffic director, and cisco view deliver a management system for a growing switched network, the RMON functionality is contained in the NMP (Network Management Processor)

To enable a LANE client for the first emulated LAN, enter the command "lane client ethernet [elan-name1]"

Priority Queuing uses 4 lists, high, medium, normal, low
Custom Queueing uses queue lists which allow you to assign traffic based on bandwidth required.