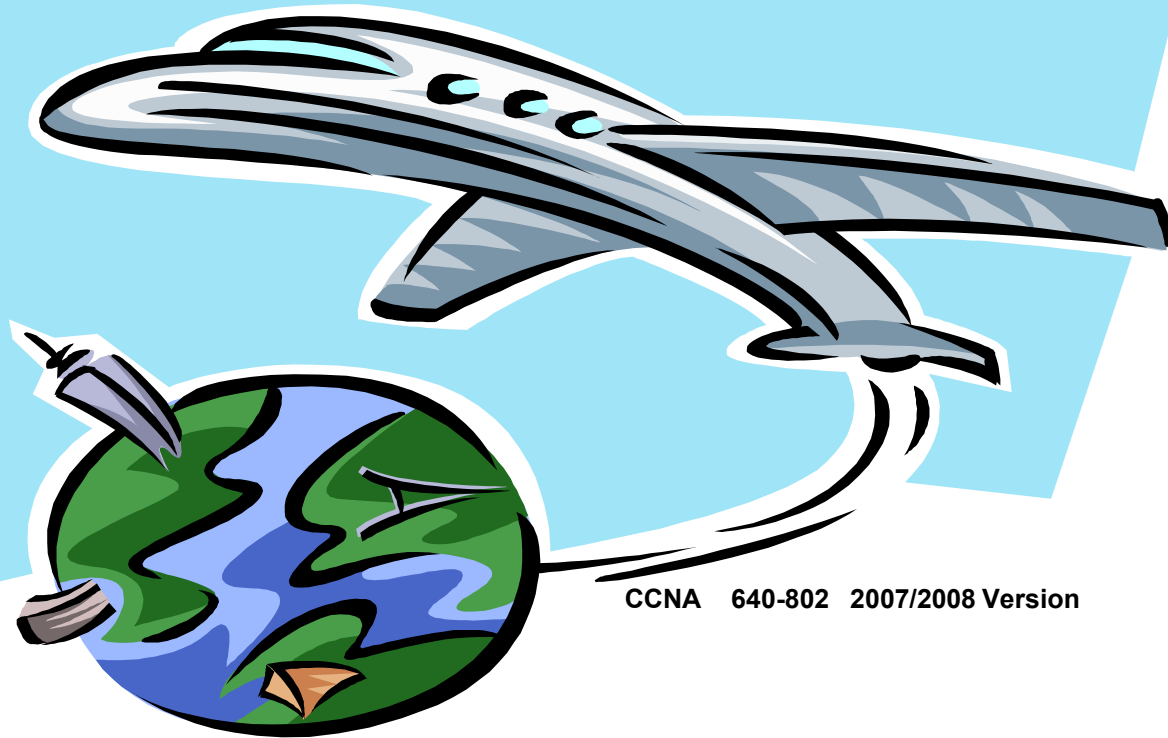# KCommunications

CCNA Routing

CCNA   640-802   2007/2008 Version

Routing Reminder

THREE MAIN STEPS IN THE ROUTER

•**ROUTING**   -   find the outgoing interface

   based on routing table, policy routing.. etc.

•**SWITCHING**   -   move packets between interfaces

   choice of switching methods, load balancing etc.

•**ENCAPSULATION** -   build the layer two headers

   Ethernet, frame relay, HDLC, PPP etc.

Routing Reminder

Routing Steps

1….   Find best match

Longest/best match for destination

example   routes to   10.10.10.11

10.0.0.0/8

10.10.0.0/16

10.10.10.0/25   longest / best match

2….   Recursive lookup until interface is found

example   10.10.10.11   via 10.10.24.1

10.10.24.0/24   via   10.10.99.1

10.10.99.1 directly connected via FastEthernet 0/7

Routing Reminder

Metric vs Admin Distance

IF there are more than one best match route to the same destination

IF they are from the same routing protocol (same admin distances)

metric with the lowest metric (best cost) will be used

IF they are from different routing protocols

admin distance with the lowest value will be used

Routing Reminder

Switching brief

PROCESS SWITCHING -   CPU is used for every packet

FAST SWITCHING   -   CPU process switches the first packet then

switches using a route cache

CEF SWITCHING   **-**   Cisco Express Forwarding table built from

routing and first packet toward each network

Optimal switching method.

Routing Reminder

Encapsulation   (build layer 2 header etc.)

REMEMBER -   point to point interfaces do not need layer 2 to 3 mapping

Multi-point interfaces such as;

Ethernet   -   requires mapping   eg IP to MAC

show arp   to view mapping

Frame Relay -   requires mapping   eg IP to DLCI

show frame-relay map   to view mapping

Routing Reminder

Distance Vector Basics

REMEMBER

DV Routers send periodic full updates (RIP = 30 seconds)

DV Routers send triggered partial updates when a link fails

DV Routers that receive the partial updates then send the same update on to their neighbors…..

DV Routers send the same poison route back to the router that sent the partial update i.e. Split horizon rule suspended for this function

DV Routers place the route in holddown when a poison route is received and ignore information on that route until holddown timer has expired unless the information comes from the originating router for that route   i.e. the failure has gone

DV Routers can use poison reverse and split horizon for loop prevention. Cisco default for RIP is poison reverse.

Routing Reminder

Link State Basics

REMEMBER

Link State provides fast convergence with built in loop prevention

Link State routers consume more CPU and memory than DV routers

Link State routing is more complex to implement and plan than DV

Link State routers learn the same information about all routers and subnets in their area

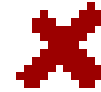**Link State routers store LSAs (Link State Advertisements) in RAM in their LSBD (Link State DataBase)**

Network Routing Protocols Review

Protocol	STATIC	RIP v1	RIP v2	IGRP	EIGRP	OSPF
Admin distance						
VLSM						
update						
metric						
method						
Auto summary						
Loop prevention						

VLSM and Basic Routing REVIEW

•VLSM and network masks etc Routing configuration commands	
•Classless routing (EIGRP, OSPF, RIP v2)	
•Classful routing (RIP v1, IGRP)	
•Distance vector vs Link state routing	
•Administration distances •Routing, static, connected, default route	
•Routing tables, databases and ARP	
•Access-lists & NAT	