

Cisco Fault-Tolerant Routing

Fault-Tolerant methods at the Data Link and Network Layers

Proxy Address Resolution Protocol (*Proxy ARP*)

- An intermediate device, such as a router, sends an ARP response *on behalf* of an end node to the requesting host.

Proxy ARP is enabled on Cisco routers by default.

```
> int e 0
```

```
>[no] ip proxy-arp
```

(Cisco routers default to **four-hour ARP time-out**)

```
>show ip arp (Displays ARP router contents)
```

ICMP Router Discovery Protocol (IRDP) - An extension of the

ICMP protocol allows routers to advertise default routes to end stations. The end stations need to run the IRDP daemon. IRDP is enabled by default on DHCP clients that running Microsoft Windows 95 (with Winsock 2), Windows 95 OSR2, Windows 98, Windows 98 SE, and Windows 2000 machines. IRDP daemons listen for the IRDP hello messages, ICMP Router Solicitation packets, which are sent out as multicast packets - **224.0.0.2**. Hello messages are sent out every **7 to 10 minutes**, with a holdtime of 30 minutes.

Firewall and Routers: Block all ICMP Type 9 & Type 10 packets. This should protect against remote Denial of Service attacks.

Hot Standby Routing Protocol (*HSRP*) - Creates a

single virtual standby router that is a set of at least two routers or more.

Cisco IOS only protocol.

```
>int f0/0 (Interface mode)
```

```
>show standby
```

```
>standby 1 ip 172.16.1.241
```

(On the both the active and standby routers configure the IP virtual address)

An ARP of the virtual IP will create a hardware cache entry on the router.

After both routers have been configured, they begin to send hello messages every **three seconds** to the multicast address **224.0.0.2**.

The **Priority option** set on the router controls which router wins the election. The router with the highest priority wins.

The **Preempt option** allows a new router to take over the active role if this new router becomes available.

```
>standby 1 priority 1
```

```
>standby 1 preempt
```

The HSRP

amount

```
>debug stand
```

```
To view the hello messages received on the router
```

HSRP may be used with **multiple groups** under a single interface.

One HSRP group per destination.

Also, HSRP supports protocols other than IP.

```
>standby 1 ip ipaddress (At the interface configuration mode)
```

```
>standby 1 authentication name
```

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