

Host Settings—If these are missing entirely, either troubleshoot a DHCP server or enter them manually.

D H C P S E R V E R

DHCP Relay—Needed if the DHCP server is off-LAN and must be entered on the router interface that serves the host's LAN

```
R1(config-if)#ip helper-address <dhcp server address>
```

- Make sure the address is correct
- Test with an extended ping on the router to the server address using the ip address of the LAN interface as the source address

H O S T S E T T I N G S

Are the router and host in the same subnet? Do the mask math.

DNS—Is this correct? It's a simple IP address that's either right, wrong, or missing.

- When incorrect, names fail, but addresses succeed
- Figure out where it came from
 - If manual, fix it
 - If DHCP, fix the server setting
- Is the DNS server reachable
- Router Settings—if the router is using DNS

```
R1(config)# ip name-server <ip address> <ip address> ...
R1(config)# ip domain-lookup
                On by default
```

Default Router / Gateway

- Does this match the router interface address that feeds the host LAN?
- Does the subnet mask match that of the router? This setting determines when the default gateway is used and when frames are directly dispatched.
- Can the host ping its default gateway
 - The router's interface must be up/up
 - Check L1 and L2 problems—port security, speed mismatch, STP

R O U T I N G P R O B L E M S

Routing uses the most specific path in the routing table.

```
R1# show ip route 10.0.0.1
```

Tells you what choice the router would have made for that destination

Overlapping routes can be caused by

- summary routes—automatic, manual (static)
- bad subnets that really do overlap

IOS can detect if the overlaps are on the same router.

Non-VLSM Overlaps (same mask throughout) require an addressing mistake.

- To find, just calculate the network of each address (apply mask)
- To fix, re-subnet correctly

VLSM (Variable Length Subnet Mask) definition—multiple subnet masks are used for different subnets in the *same* classful network

- Only classless routing protocols can be used
- Address overlaps can be partial
- To find overlaps, need to calculate whole address range represented by each address and mask combination.