9(A). Interface Speed & Duplex

MANUAL CONFIGURATION

Speed and duplex autonegotiate by default, but can be manually set

```
SW(config-if)# speed { auto | 10 | 100 | 1000 }
```
Available options depend on your interface
```
SW(config-if)# duplex { auto | full | half }
SW(config-if)# no speed
```
Removes a manual speed config and reverts to default (default duplex is the same)
```
SW(config-if)# description Access Port for cubicle 28493A
```

```
SW# show interfaces status
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1     TO ROUTER          connected    trunk        full    100 10/100BaseTX
```
The "Name" column comes from the "description" interface configuration command
```
Fa0/2                        notconnect   2            auto   auto 10/100BaseTX
```
These interfaces are physically 10/100, but that tells us nothing about their config
```
Fa0/3                        notconnect   2            auto   auto 10/100BaseTX
```
Speed and duplex on fa0/3 will auto-config as soon as a device is connected
```
Fa0/8                        notconnect   2            auto   auto 10/100BaseTX
Fa0/9     BRO                notconnect   22           auto   auto 10/100BaseTX
Fa0/10    PROTOLAB           connected    22           full    100 10/100BaseTX
```
Duplex and speed were manually set on fa0/10 to full & 100 Mbps
```
Fa0/11    ALUM               connected    3          a-full  a-100 10/100BaseTX
```
Here, speed and duplex have autonegotiated to full & 100 Mbps
```
Fa0/12    LJ5MP              connected    2          a-full  a-100 10/100BaseTX
Fa0/20    LJ8550dn           err-disabled 2            auto   auto 10/100BaseTX
```
fa0/20 has been shut down by port security (Discussed in the next section)
```
Fa0/21    TO W/L ACCESS POIN connected    2          a-full  a-100 10/100BaseTX
Fa0/22                       notconnect   2            auto   auto 10/100BaseTX
Gi0/1     MINI               connected    22         a-full a-1000 10/100/1000BaseTX
Gi0/2     LENNY              connected    22         a-full a-1000 10/100/1000BaseTX
```
Gi0/1 and Gi0/2 have autonegotiated to full duplex at gigabit speed

You can manually shut down a port or range of ports

```
SW(config)# interface range fa0/2 -24
SW(config-if-range)# [no] shutdown
```
"No" removes a command, often restoring an invisible default.

AUTONEGOTIATION

Cisco interfaces that can run at more than one speed, e.g. 10/100, autonegotiate by default. By IEEE rules, when both sides autonegotiate, they choose the best speed and duplex that both support. If only one side participates in autonegotiation and realizes that it has no negotiating partner, it will make its own choices, which differ between standard IEEE devices and Cisco products:

	IEEE	Cisco
Speed	Lowest supported	Try to sense the speed by listening. If unsuccessful, fall back to the IEEE standard of slowest supported.
Duplex	Same as Cisco	For 10 / 100 speed, use half-duplex. For Gigabit and better, use full.

DUPLEX MISMATCH

Duplex Mismatch—The preceding defaults can result in one end being half-duplex and the other full. For example, if a PC is manually set to 100-full (no autonegotiation), the Cisco switch will correctly sense the 100, but default to half-duplex. The switch will sense collisions because the PC (full-duplex) won't use collision detection and will send whenever it needs to., even if the switch happens to be already sending.

Note: No collision physically occurs on a switch because both ends are still transmitting on different pairs. With hubs, collisions *can* occur even though send and receive are on different pairs because more than two devices can be connected.

Hub Autonegotiation—Hubs don't autonegotiate and don't forward autonegotiation messages. This can force IEEE behavior (10-half) both between the hub and a switch and between the hub and hosts.