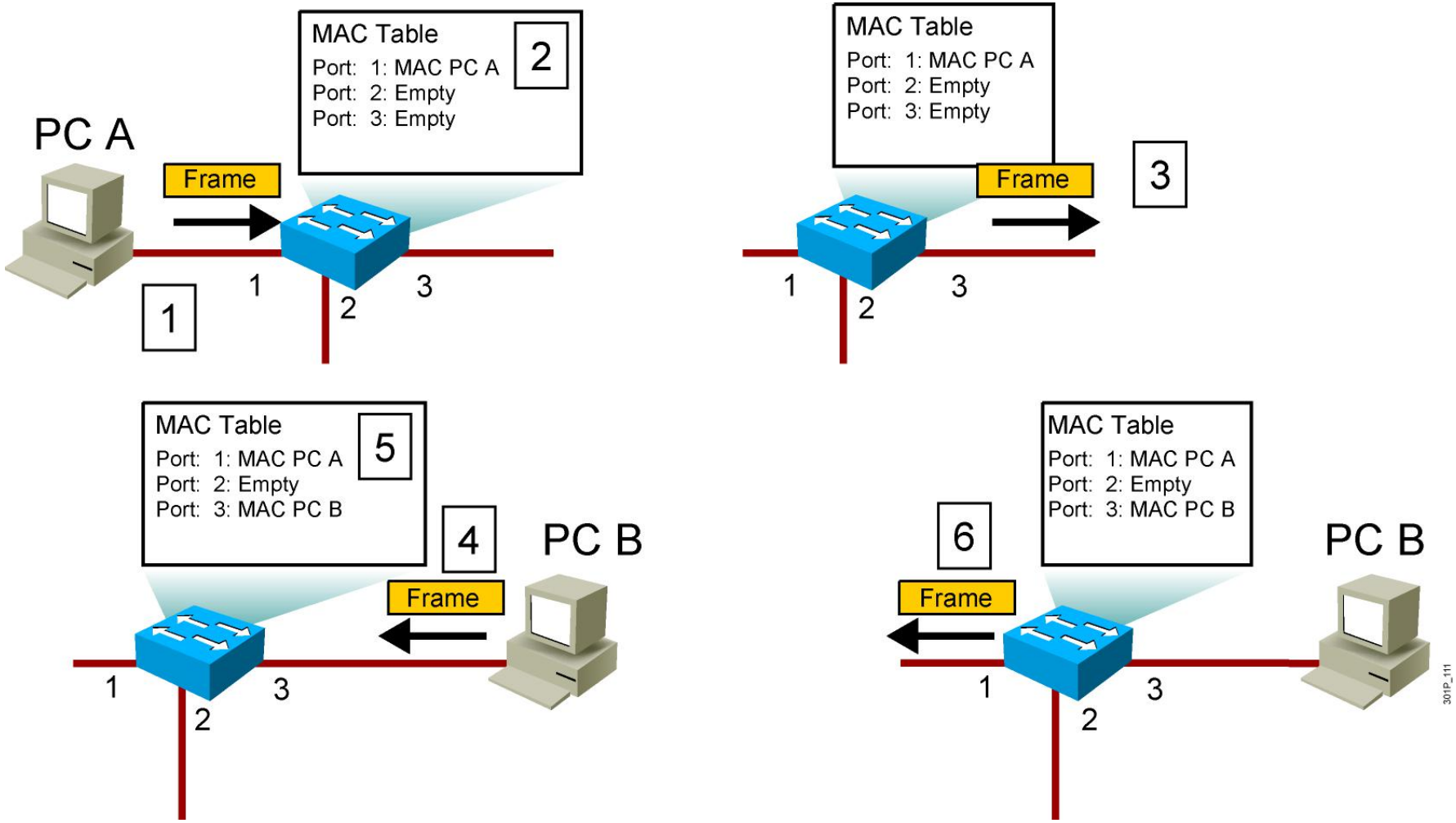
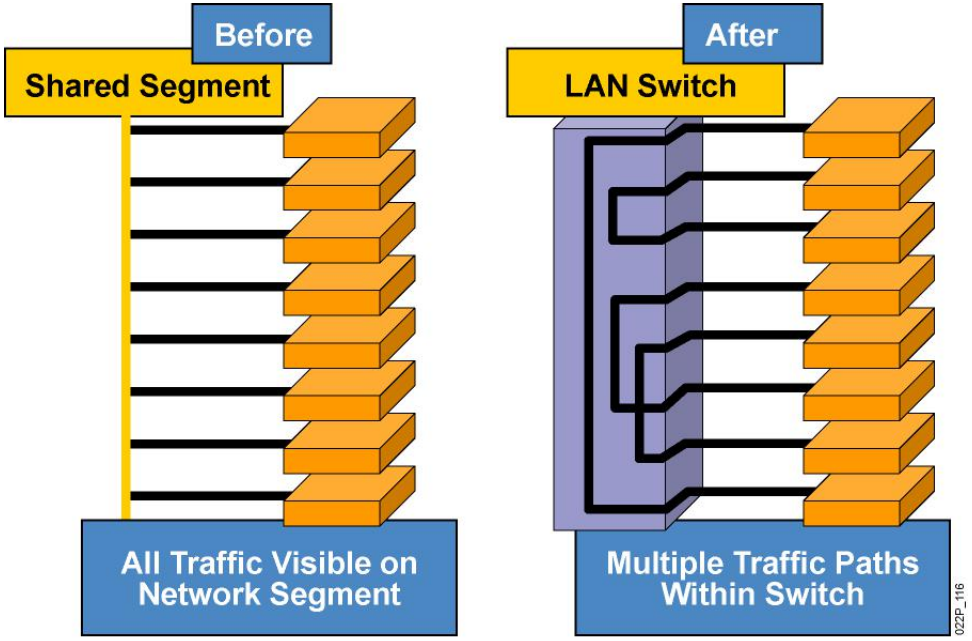
Benefits of Switching

Switching Frames



Microsegmentation

Microsegmentation of the Network

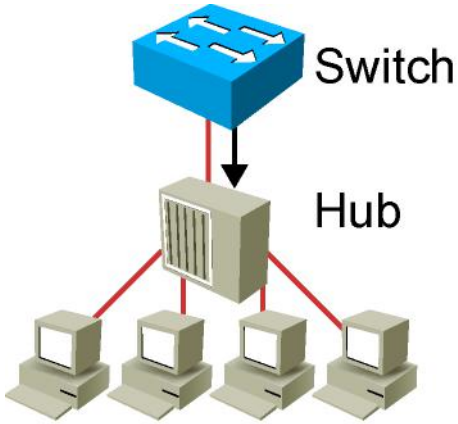


Dedicated paths between sender and receiver hosts

Duplex Overview

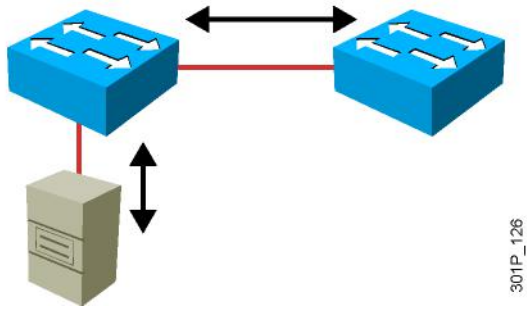
Half Duplex (CSMA/CD)

- Unidirectional data flow
- Higher potential for collision
- Hub connectivity



Full Duplex

- Point-to-point only
- Attached to dedicated switched port
- Requires full-duplex support on both ends
- Collision-free
- Collision detect circuit disabled



Setting Duplex and Speed Options

Cisco Catalyst 2960 Series

```
SwitchX(config)#interface fa0/1
SwitchX(config-if)#duplex {auto | full | half}
```

Cisco Catalyst 2960 Series

```
SwitchX(config)#interface fa0/1
SwitchX(config-if)#speed {10 | 100 | 1000 | auto}
```

Showing Duplex Options

```
SwitchX#show interfaces fastethernet0/2
FastEthernet0/2 is up, line protocol is up (connected)
  Hardware is Fast Ethernet, address is 0008.a445.9b42 (bia 0008.a445.9b42)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 10Mb/s
  input flow-control is unsupported output flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:57, output 00:00:01, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     323479 packets input, 44931071 bytes, 0 no buffer
     Received 98960 broadcasts (0 multicast)
     1 runts, 0 giants, 0 throttles
     1 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 36374 multicast, 0 pause input
     0 input packets with dribble condition detected
     1284934 packets output, 103121707 bytes, 0 underruns
     0 output errors, 2 collisions, 6 interface resets
     0 babbles, 0 late collision, 29 deferred
     0 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
```

The Hierarchy of Connectivity

Core layer: Provides optimal transport between core routers and distribution sites

Distribution layer: Provides policy-based connectivity, ? peer reduction, and aggregation

Access layer: Provides common group access to the internetworking environment