ROUTER BASICS

MM Clements

Router Sorts Incoming Traffic

- Acts like Internet roundabout
- Allows data to get closer to its destination
- Best path decision made by router

- Incoming packets are switched to the most appropriate outgoing network

Data Link Layer and Routing

- Router does not pass on layer 2 data
  - e.g. broadcasts do not pass router
- Layer 2 header is modified by router
- Source and destination MAC addresses are changed at each router

Network Path Determination

- Router accepts packet and views inside Network Layer header
- IP address of destination carried in Network Layer header and other information
- Destination IP address looked up in routing table
- Packet passed to appropriate exit interface

Transport Layer Determination

- Transport Layer header contents examined
- Source and destination port checked
- May trigger security of an Access Control List
- May drop packets under heavy load
  - UDP often first casualty

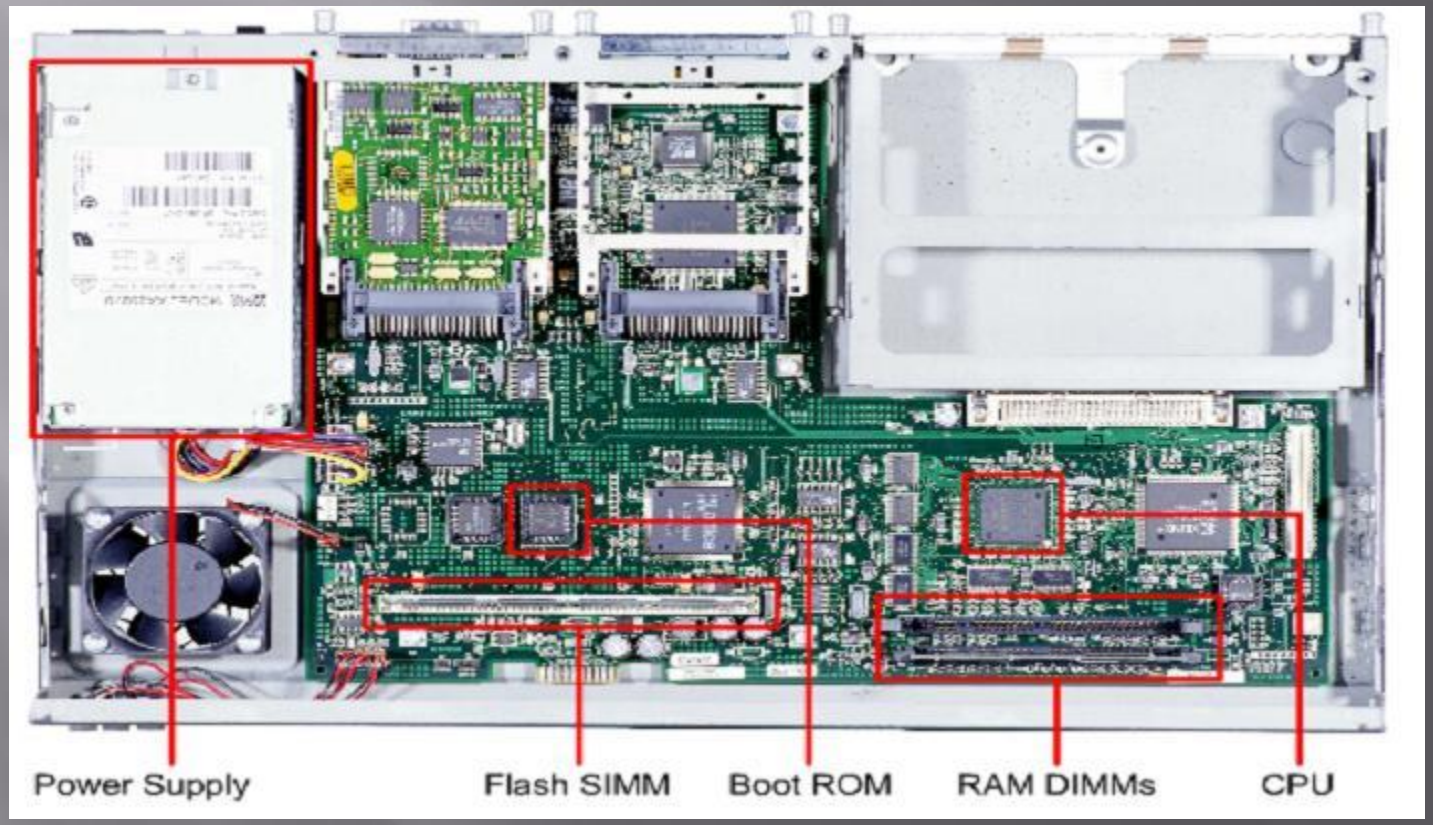
Access Control Lists

- Used to identify incoming packets
- Can be used for security purposes
- E.g. do not allow TELNET traffic
  - Identified by destination port number 23
  - Found in Transport Layer header
- More on ACLs later in course

Inside a Router

- Router is a dedicated computer
- Contains hardware found in most PCs
- Does not have hard disk – Flash memory is used instead to hold IOS
- NVRAM used to hold configuration files
- DRAM used to hold routing tables, buffering, ARP cache etc
- CPU, ROM and interfaces too

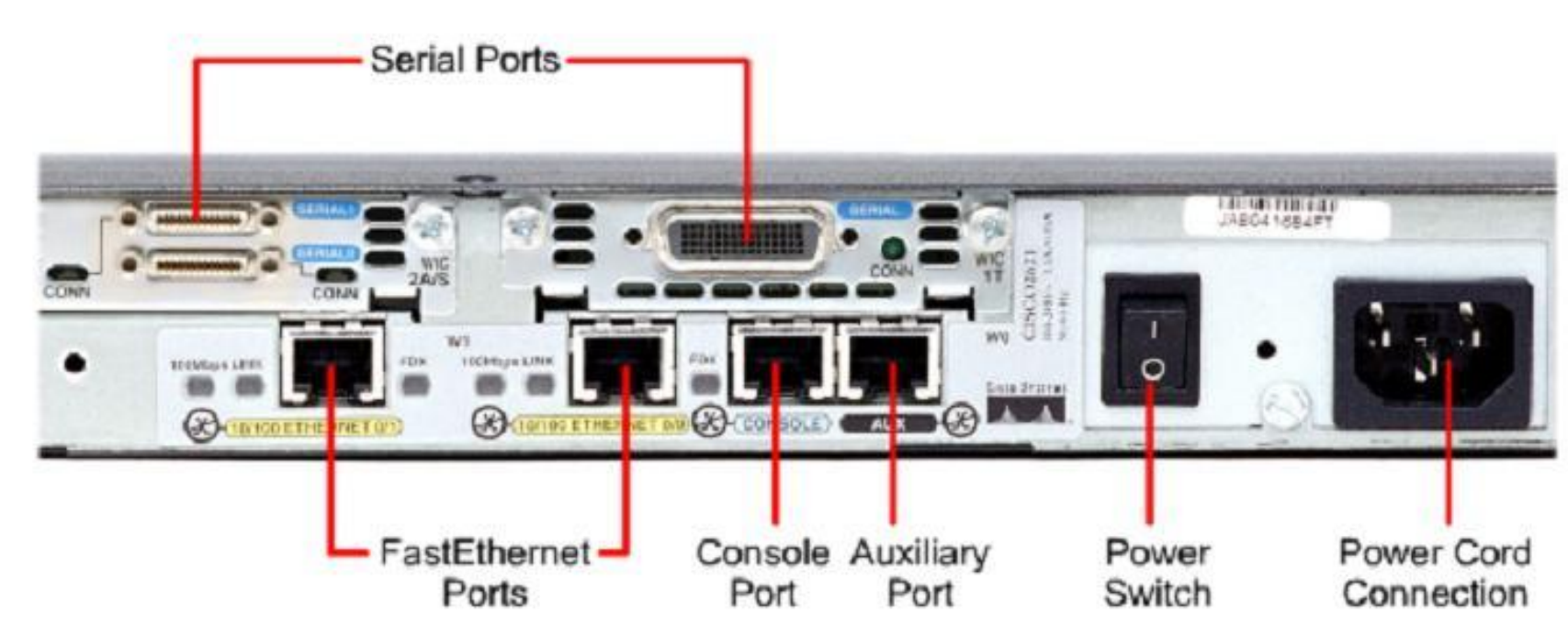
Internal Components of a 2600 Router



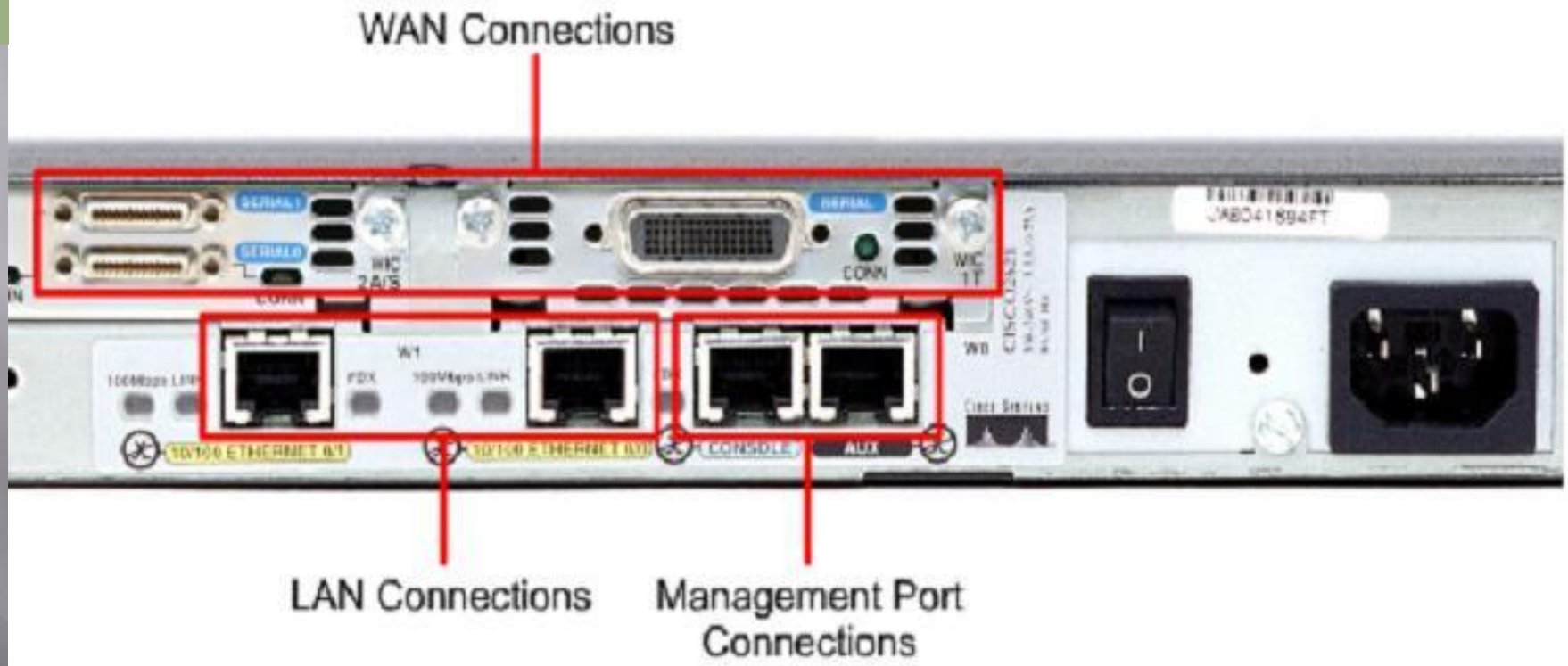
External Connections

- Configuration connections
  - Console and AUX
- LAN connections
  - FastEthernet (usually)
- WAN connections – often via WAN Interface Cards (WICs)
- Newer hardware is modular
- Makes upgrading cheaper

External Connections on a Router



Router Connections

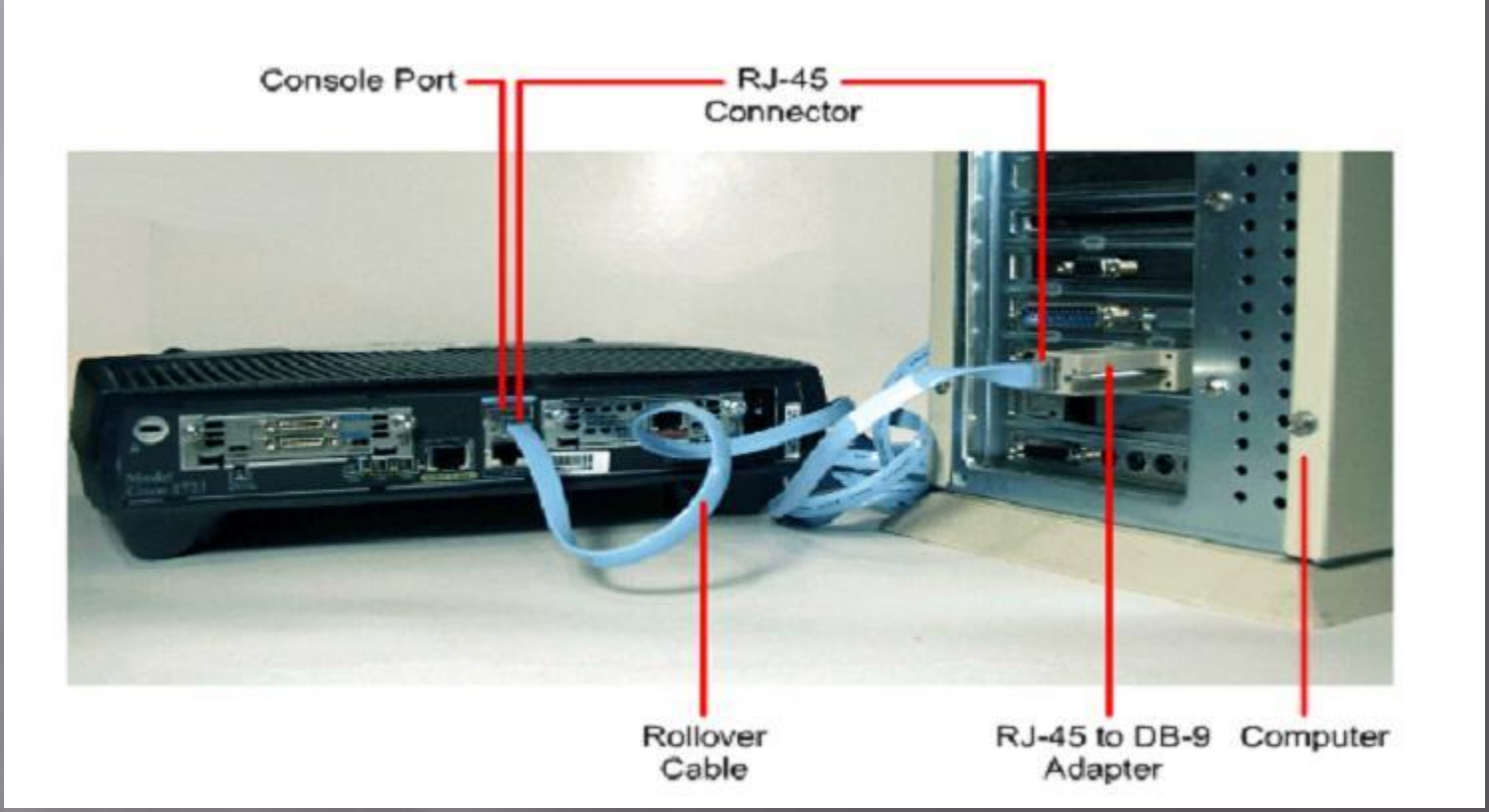


Connecting to a Router

- First-time connection must be via console cable attached to a PC
- PC runs terminal emulator e.g. Hyperterminal
- Correct parameters must be set

9600 baud
8 data bits
1 stop bit
No parity
No flow control

Physical Connection to Router



Conclusion

- Routers choose paths and switch data packets
- IOS runs on Cisco hardware
- Apply security etc.
- No hard disk – all solid state
- New routers have modular chassis for flexibility
- Terminal emulator and rollover cable to connect