

① Internet Connectivity



Routers and Switches form the foundation of your connectivity to the Internet. Routers connect networks, while

switches manage the individual connections of each device in your network. Routers and switches have similar but distinct responsibilities that keep your network humming along.



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CYBERSECURITY ROUTERS & SWITCHES CHEAT SHEET

② Router Basics



If you want your network connect to the internet and the world of information it offers, you need a router to open the

door. A router acts as a virtual highway, moving data from the internet back into the networks it connects. It also stores information about the network that can be queried about the devices stored in its inner tables. There are multi-function routers that can provide switching and security functions as well. These multi-function routers with routing, switching, and security functionality makes it easy to recover quickly from an outage. Although it's possible to have a single router perform all three functions, we recommend having separate devices perform separate primary functions. This allows users to access internal applications via switches if a router fails.

Switch Basics ③

Switches connect PCs, laptops, printers, and more within a certain location and ensure fast, healthy performance of network devices.

Router can act as a switch in an emergency performing routing functions, if needed.

There are two types of switches, managed and unmanaged. Managed switches allow network administrators the most control over device connections. In map of all your network devices, the switch and all the devices it connects will be distinct on the map. Managed switches have an interface where users can go in and update settings, such as shut down or enabling ports, and even tuning the speed of devices to the speed of the switch that's connecting to achieve optimal performance.



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Router Hardening ⑥

Securing your router against attacks is known as hardening your Router. It includes enabling secure, tough-to-crack passwords that are encrypted when configuring it, to shutting down of unnecessary ports and services. A router that has few vulnerabilities is harder for attackers to exploit.



④ Connectivity Failures



When a core router or switch fails at work, nobody's happy. Complaints will pour in to IT. Work is stalled. IT scrambles. It may very well feel like the sun will never shine again.

Connectivity failures happen and when they do knowing what the problem is can be helpful when talking to your IT department. If a user is unable to connect with any external applications the problem is most likely a router issue. However, if internal applications are unavailable then the problem is related to the switch.

⑤ Router and Switch Benefits



Routers and switches can be the key cogs to deploying robust network architecture. We recommend that you purchase quality devices and utilize their full

capabilities, and then monitor them carefully for any signs of failure that will help keep your door to the outside world open. By implementing optimally-tuned routers and switches your business can enjoy

1. Share applications across networks and locations
2. Increase access to real-time information
3. Reduce operating costs (especially if your routers/switches are multi-function)
4. Ensure network security
5. Enable remote connections to get work done from anywhere
6. Improve network management.

Disable unused router interfaces—that's right, find ANY interface that is not in use and make sure you issue the shutdown command
Disable unused services—these typically include:

- BOOTP
- CDP
- Configuration autoloading
- FTP
- TFTP
- PAD
- TCP and UDP minor services
- DEC MOP

Disable management protocols that you are not using—these typically include:

- SNMP
- HTTP or HTTPS
- DNS

Disable features that are techniques used for redirecting your traffic:

- ICMP Redirects
- IP Source routing

Disable features that are techniques for probes and scans in reconnaissance attacks:

- Finger
- ICMP unreachable
- ICMP mask reply

Ensure security of terminal connections:

- IP identification service
- TCP keepalives

Disable gratuitous ARP and proxy ARP
Disable IP-directed broadcasts

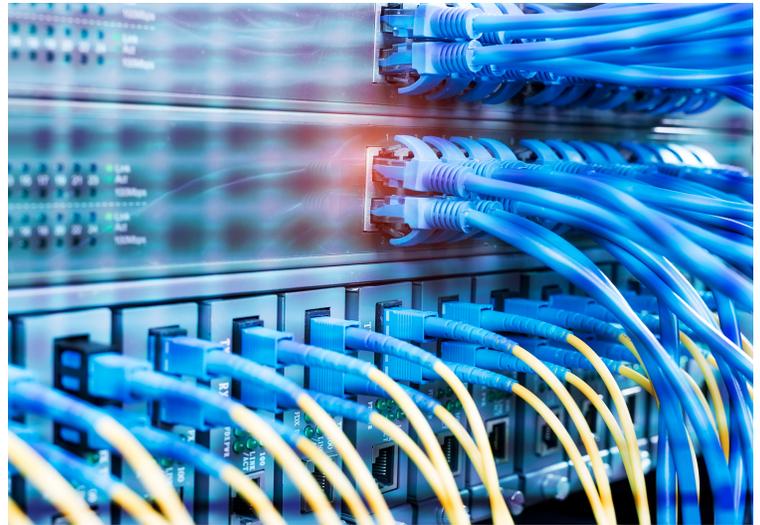
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⑦ Switch Hardening

- Disable all unused ports and place them in an unused VLAN.
- Set all user ports to non trunking mode by disabling DTP. (It is not a bad idea to set all ports by default to access mode and then reconfigure the trunking ports as needed.)
- Switch(config-if)#switchport nonegotiate
- For backbone switch-to-switch connections, explicitly configure trunking and disable DTP.
- Switch(config-if)#switchport mode (access | trunk | dynamic auto dynamic desirable)
- Do not use VLAN 1 as the switch management VLAN.
- Switch(config-if)#switchport trunk native vlan vlan-id



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