

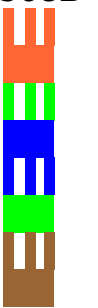
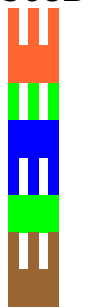
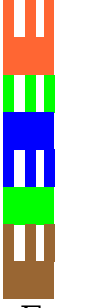
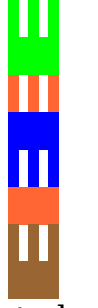
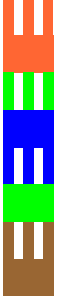
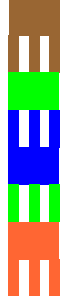
Networking Reference (by Iuri Stanchev)

I thought that a little bit of theory won't hurt. I made this document as a part of my preparation for certification exams. If you find any mistakes please contact me. The document doesn't meant to be full, but to present important networking information in a short way. If you like to see your additions to it - contact me.

This networking reference is a short document with tables/graphics about:

1. OSI Model; OSI Layers and Applications/Services/Devices working on this Layers; The Protocol Data Units on the different OSI Layers
2. Cabling information and types of devices using them
3. IP Classes and Ranges
4. Wireless Standards
5. Logical topologies of networks and MAC broad categories
6. Switch modes
7. Routing protocols
8. Network Topologies

Layer Number	OSI Model Layers	Applications/Services	PDU	Devices
7	Application	telnet	data	
6	Presentation		data	
5	Session		data	
4	Transport		segment	
3	Network	ping, traceroute	packet	router
2	Data Link	cdp	frame	switch, bridge
1	Physical		bit	hub, repeater

Cable type	Pins	Connects
Straight through	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>T568B</p>  </div> <div style="text-align: center;"> <p>T568B</p>  </div> </div>	<p>hub with PC switch with PC switch with Router</p>
Crossover	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>T568B</p>  </div> <div style="text-align: center;"> <p>T568A</p>  </div> </div> <p>Note: For a four twisted pair cable the pinout is: 1 - 3; 2 - 6; 3 - 1; 4 - 7; 5 - 8; 6 - 2; 7 - 4; 8 - 5</p>	<p>switch with switch switch with hub hub with hub router with router PC with PC router with router</p>
Rollover	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>	<p>router (console) with PC</p>

IP Class	IP Range	Default subnet mask
Class A	1.0.0.0 – 127.255.255.255	255.0.0.0
Class B	128.0.0.0 – 191.255.255.255	255.255.0.0
Class C	192.0.0.0 – 223.255.255.255	255.255.255.0
Class D	224.0.0.0 – 239.255.255.255	
Class E	240.0.0.0 – 254.255.255.255	

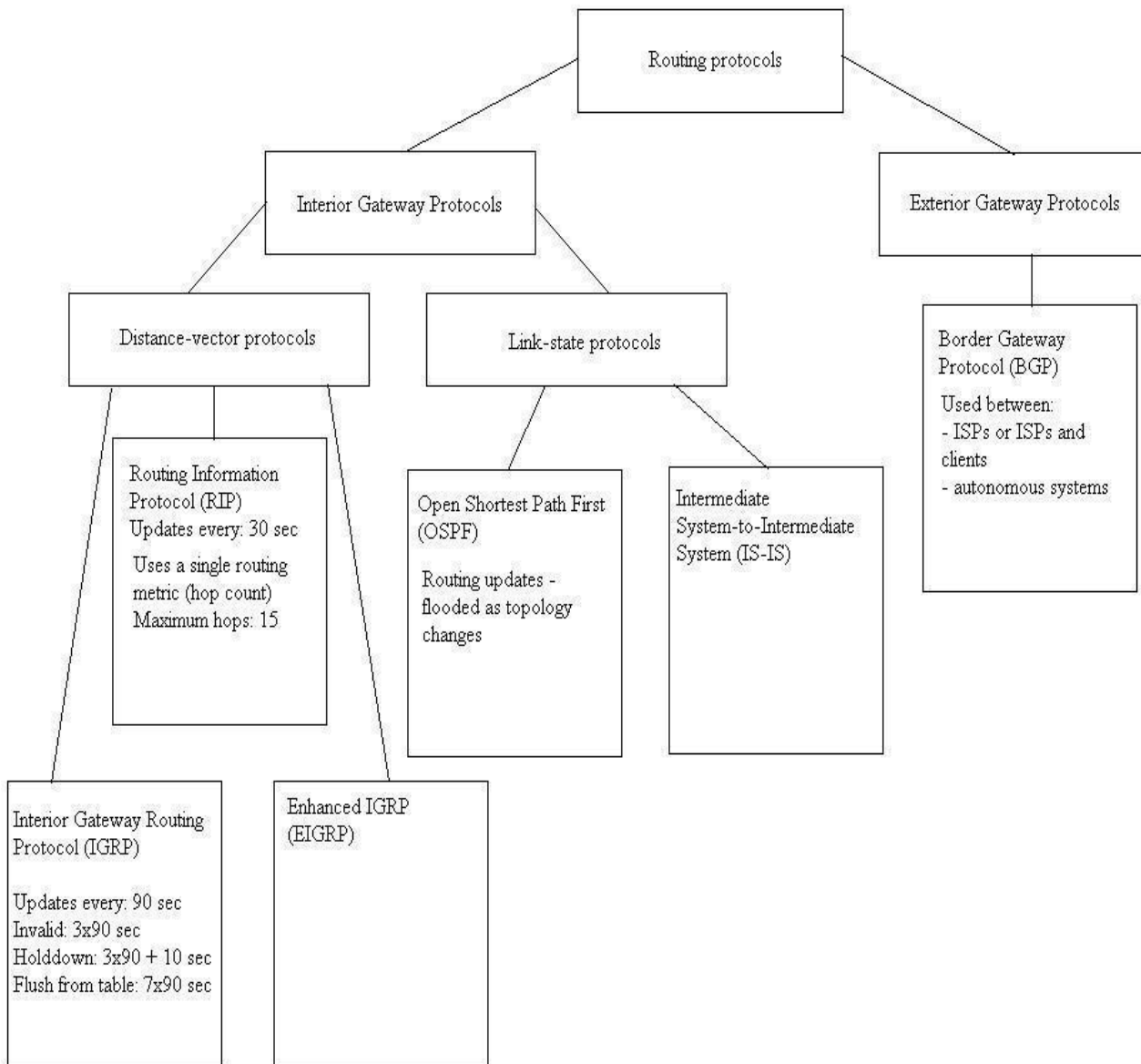
Private IP class	Private IP Range	Default subnet mask
Class A	10.0.0.0 – 10.255.255.255	255.0.0.0
Class B	172.16.0.0 – 172.31.255.255	255.240.0.0
Class C	192.168.0.0 – 192.168.255.255	255.255.0.0

IP Range description	IP Range	Default subnet mask
Broadcast	0.0.0.0 – N/A 255.255.255.255 – N/A	N/A
Null	0.0.0.1 – 0.255.255.255	255.0.0.0
Public-Data Networks	14.0.0.0 – 14.255.255.255	255.0.0.0
Cable TV Networks	24.0.0.0 – 24.255.255.255	255.0.0.0
Loopback	127.0.0.0 - 127.255.255	255.0.0.0
Link local	169.254.0.0 – 169.254.255.255	255.255.0.0
Testnet addresses	192.0.2.0 – 192.0.2.255	255.255.255.0
6to4 Relay Anycast	192.88.99.0 – 192.88.99.255	255.255.255.0
Network Interconnect/Testing	198.18.0.0 – 198.19.255.255	255.254.0.0

Wireless Standard	Frequency	Speed
802.11		1 - 2 Mbps
802.11b	2,4 GHz	11 Mbps
802.11a	5 GHz	54 Mbps 108 Mbps (with "rate doubling")
802.11g	2,4 GHz	54 Mbps 108 Mbps (with "rate doubling")

Type of Network	Logical topology	MAC broad categories
Token Ring	token passing	deterministic
Fiber Distributed Data Interface	token passing	deterministic
Ethernet	broadcast	non-deterministic

Switch modes	Short description
cut-through	lowest latency no error checking
store-and-forward	the switch receives the entire frame FCS verification
fragment-free	enough bytes are read from the source to detect a collision before forwarding

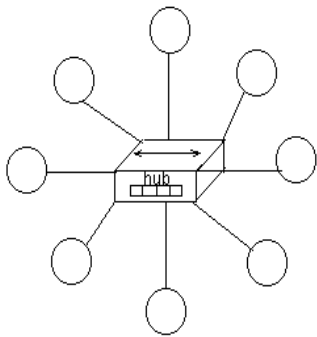


Network Topologies

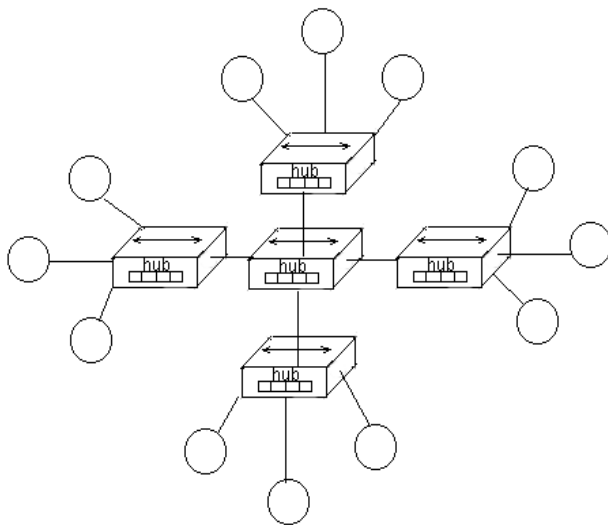
Bus Topology



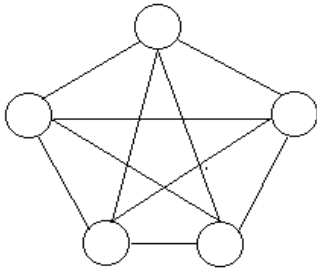
Star Topology



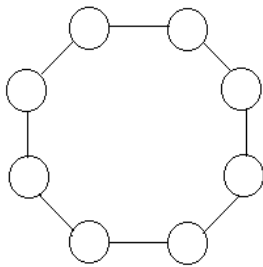
Extended Star Topology



Mesh Topology



Ring Topology



Hierarchical Topology

