

# Networking

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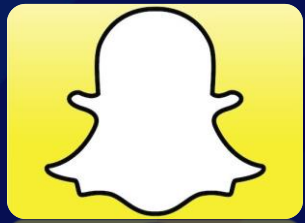
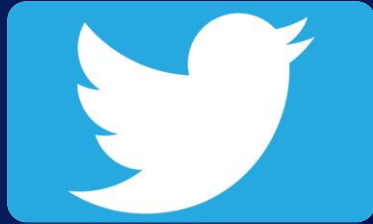
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# What is a network?

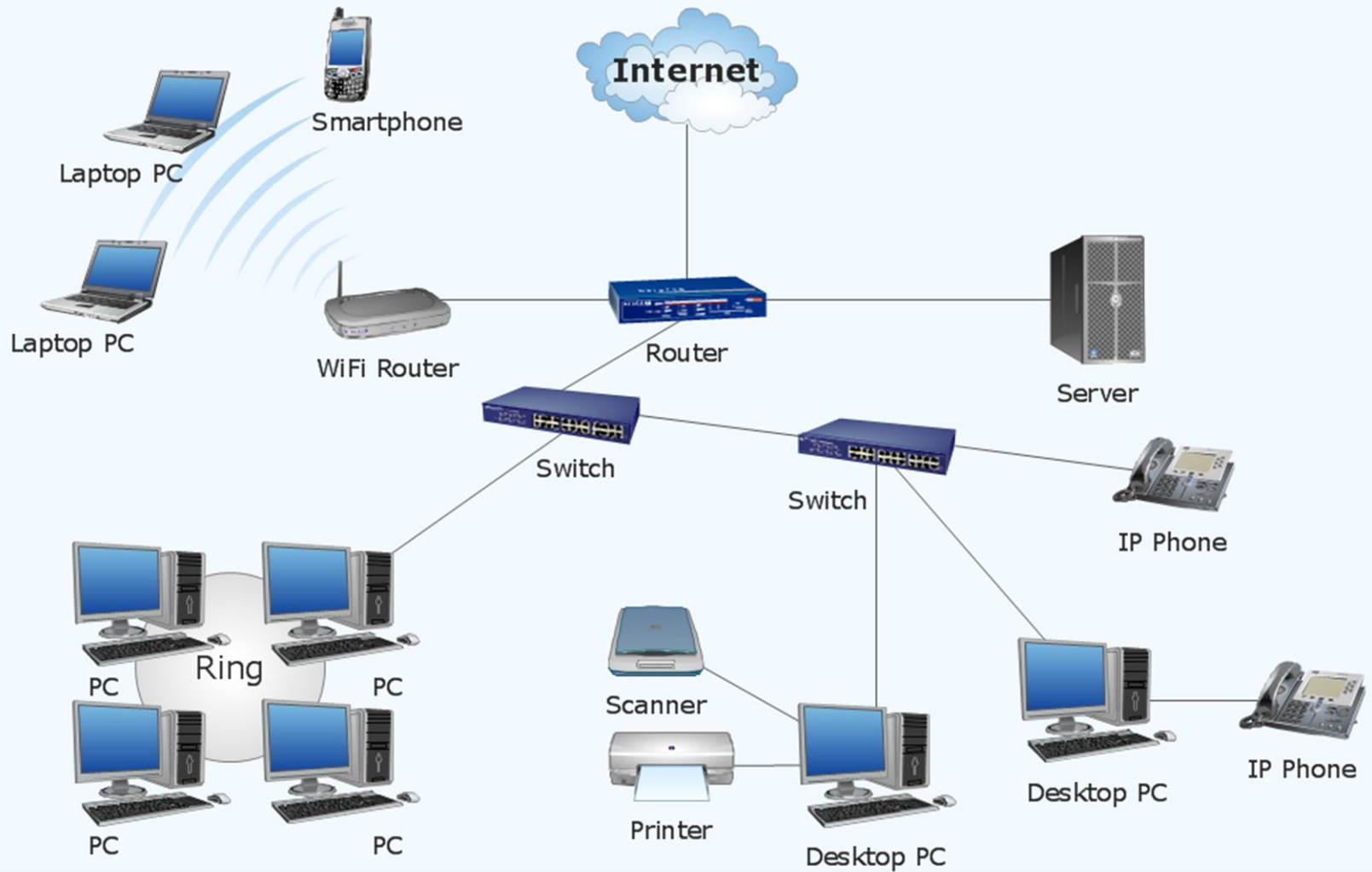


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# Shared Resources

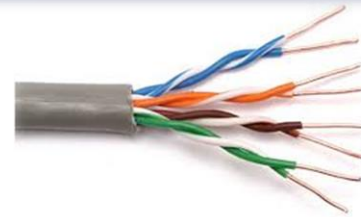
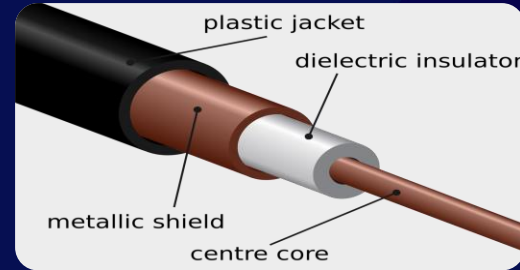


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# Cabling Standards



UTP Cable



STP Cable



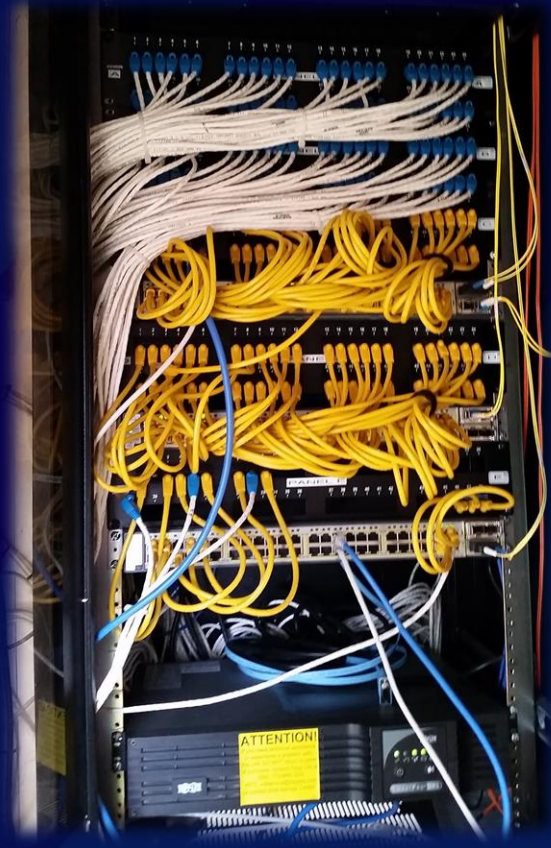
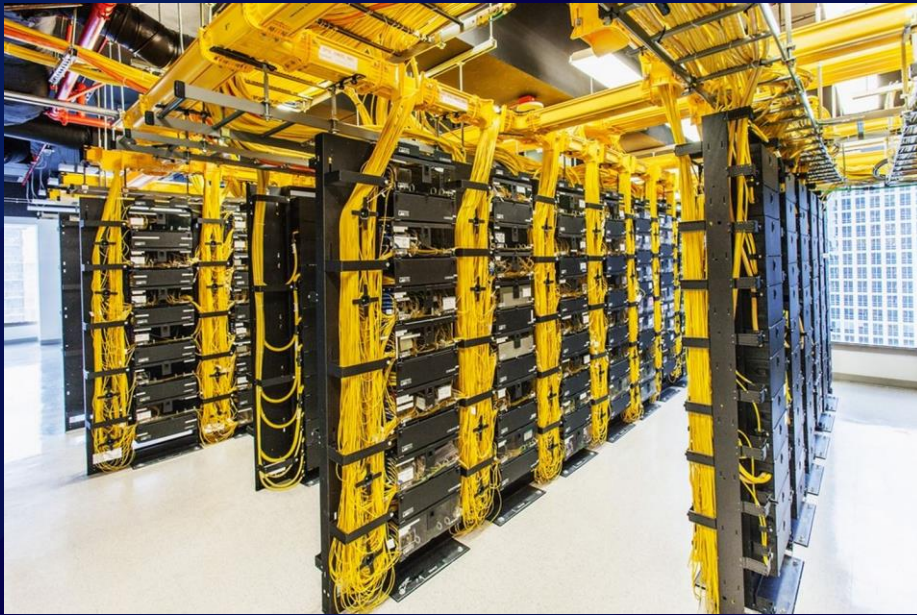
# Network Switches / Hubs



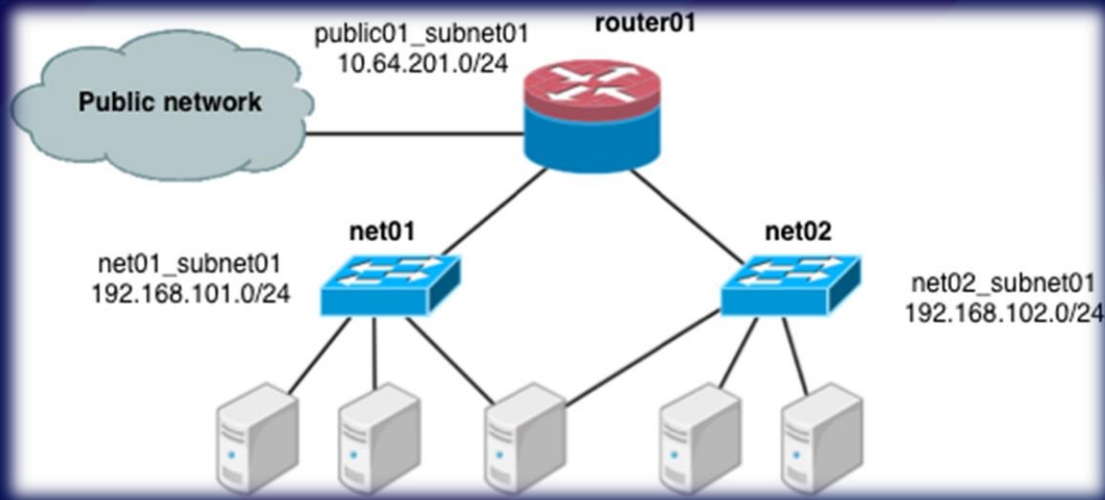
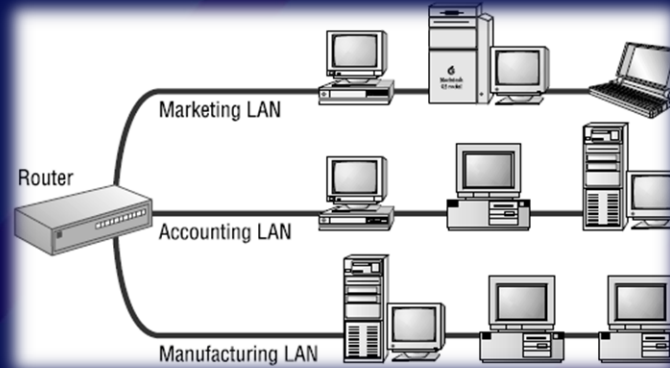
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# MDF – Main Distribution Frame

## IDF – Intermediate Distribution Frame

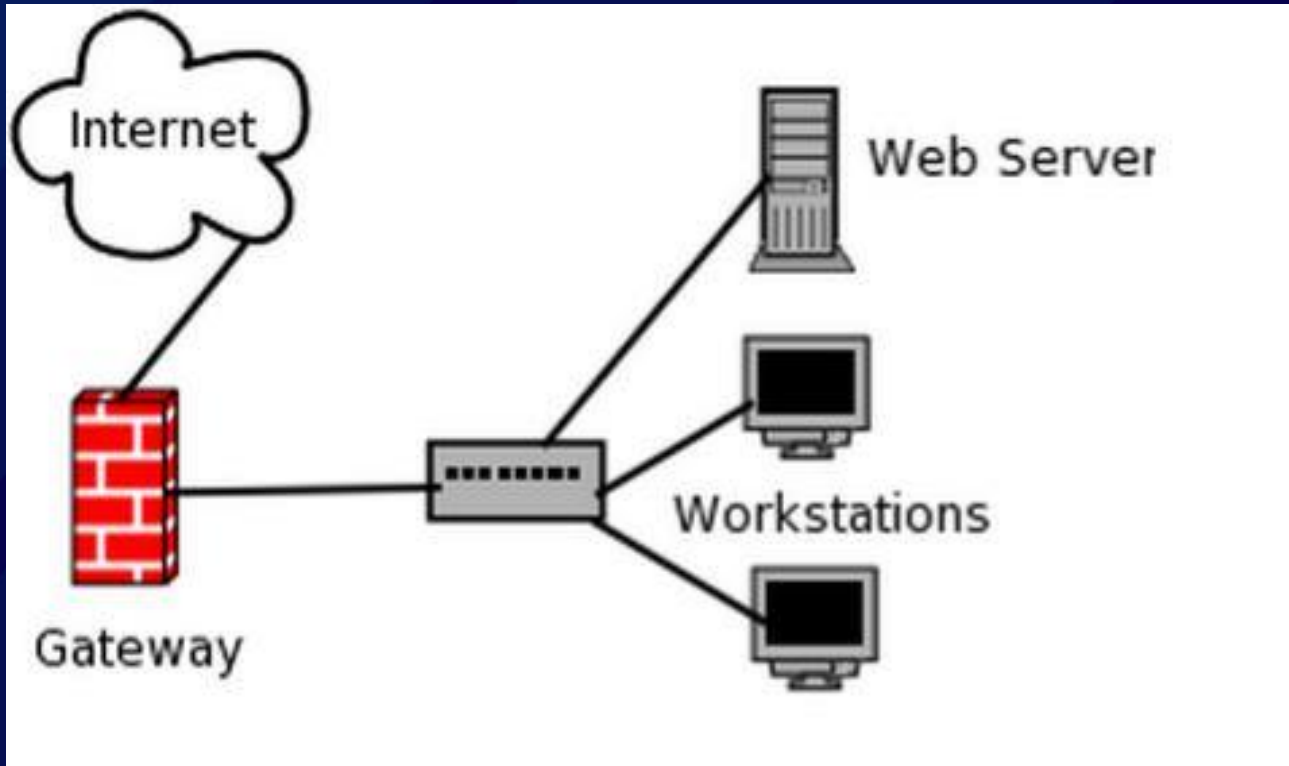


# Routers





# Gateway

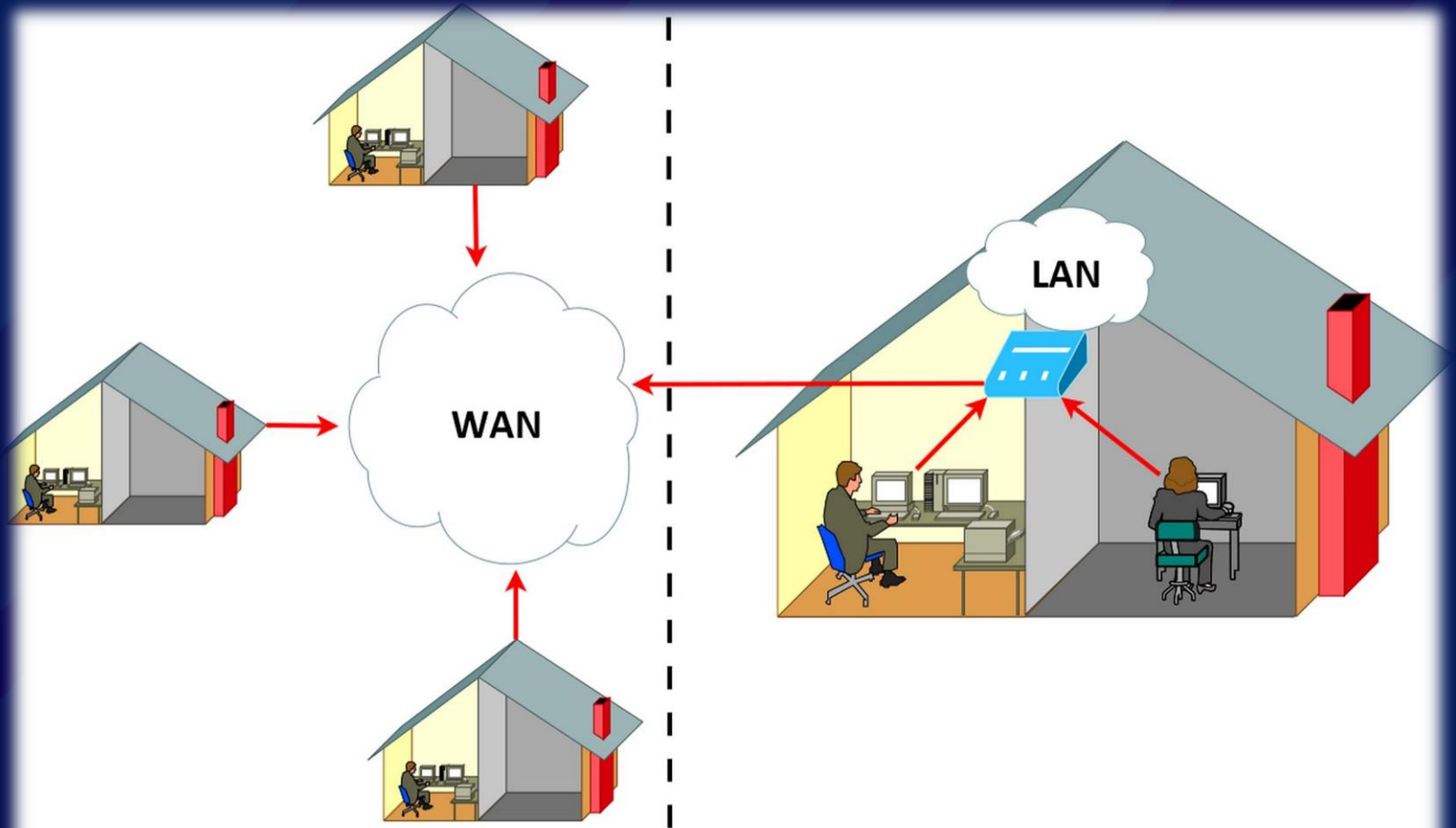


# Difference between a switch and a router

- ▶ Switch
  - ▶ filters and forwards packets between LAN segments
- ▶ Router
  - ▶ filters and forwards packets between networks. Located at Gateways, where two or more networks connect.
  - ▶ Assign an IP address via DHCP (Dynamic Host Configuration Protocol)



# LAN vs WAN



# General Diagnostics Commands

- ▶ ipconfig
- ▶ ipconfig /all
- ▶ ping
- ▶ ping -t
- ▶ tracert
- ▶ nslookup



# Protocols

- ▶ IPv4 - current IP scheme (TWU) / 32bit scheme allowing just over 4 billion addresses. Example of IPv4 *168.210.1.57*
- ▶ IPv6 - most recent version of IP (intended to replace IPv4) / 128 bit scheme written in hexadecimal Example of IP v6 address:  
*3ffe:1900:4545:3:211:d8ff:fe21:67cf*
- ▶ DHCP - automatically assign an IP address
- ▶ TCP - core protocol Internet Protocol Suite



# More Protocols

- ▶ **FTP** - transferring files over the internet from 1 host to another
- ▶ **DNS** - www.google.com - 173.194.115.38
- ▶ **SSL/TLS** - communications security over computer network
- ▶ **HTTP** - foundation of data communication for the WWW (request/response)
- ▶ **HTTPS** - adding security capabilities of SSL and TLS to HTTP
- ▶ **SMTP** - internet standard for electronic mail



# Network Monitoring

**Average Response Time & Packet Loss** THRESHOLDS EDIT HELP

**Avg Resp Time**

**Packet Loss**

**Node Details** EDIT HELP

**Management** Edit Node List Resources Unmanage Parsers  
Poll Now Rediscover

**Node Status** Node is Up

**IP Address** 10.18.11.2

**Dynamic IP** No

**Machine Type** HP Switch

**DNS**

**System Name** The101\_WA\_MDF\_2ndF\_SW1

**Description** ProCurve J9146A 2910ai-24G-PoE Switch, revision W.14.38, ROM W.14.04 (/sw/code/build/sbm34a/)

**Location**

**Contact**

**Last Boot** Thursday, June 16, 2011 1:39 PM

**Operating System**

**IOS Image** Unknown

**Hardware** Physical

**Telnet** telnet://10.18.11.2

**Web Browse** http://10.18.11.2

**Event Summary** EDIT HELP

**Average Response Time & Packet Loss** View Options EDIT HELP

TODAY

**The101\_WA\_MDF\_2ndF\_SW1**  
Average Response Time & Packet Loss  
TODAY

Response Time % Packet Loss

Response Time in milliseconds

100 ms  
80 ms  
60 ms  
40 ms  
20 ms  
0.0 ms

100 %  
90 %  
80 %  
70 %  
60 %  
50 %  
40 %  
30 %  
20 %  
10 %  
0 %

12:00 PM  
9:00 AM  
6:00 AM  
3:00 AM  
12:00 AM

Oct 2011  
95th Percentile: Response Time is 106.0 ms  
SolarWinds Orion Core Services 2011.1.1

**Current Percent Utilization of Each Interface** EDIT HELP

STATUS	INTERFACE	TRANSMIT	RECEIVE
Up	15 - SW2_Port26	0 %	0 %
Up	16 - SW3_Port26	0 %	0 %
Up	17 - ZoneDirector_LAN	0 %	0 %
Up	18 - RmMgmt_LAN	0 %	0 %
Up	19 - Nomadix_LAN	0 %	1 %
Up	21 - RmMgmt_WAN	0 %	0 %
Up	22 - PDU_WAN	0 %	0 %
Up	23 - FIOS_R	0 %	0 %
Up	24 - Nomadix_Wan	1 %	0 %



# Certifications

- ▶ Agnostic
  - ▶ CompTia Network+
  - ▶ CompTia Security+





# Certifications

## ▶ Vendor Certifications

### ▶ Entry level:

- ▶ CCENT (Cisco Certified Entry Network Technician)
- ▶ CCT (Cisco Certified Technician)

### ▶ Associate:

- ▶ CCNA (Security, Data Center, Routing & Switching, Service Provider, Video, Voice, Wireless)

### ▶ Professional:

- ▶ CCNP

### ▶ Expert:

- ▶ CCIE (Cisco Certified Internetwork Expert)

### ▶ Architect

- ▶ CCAr

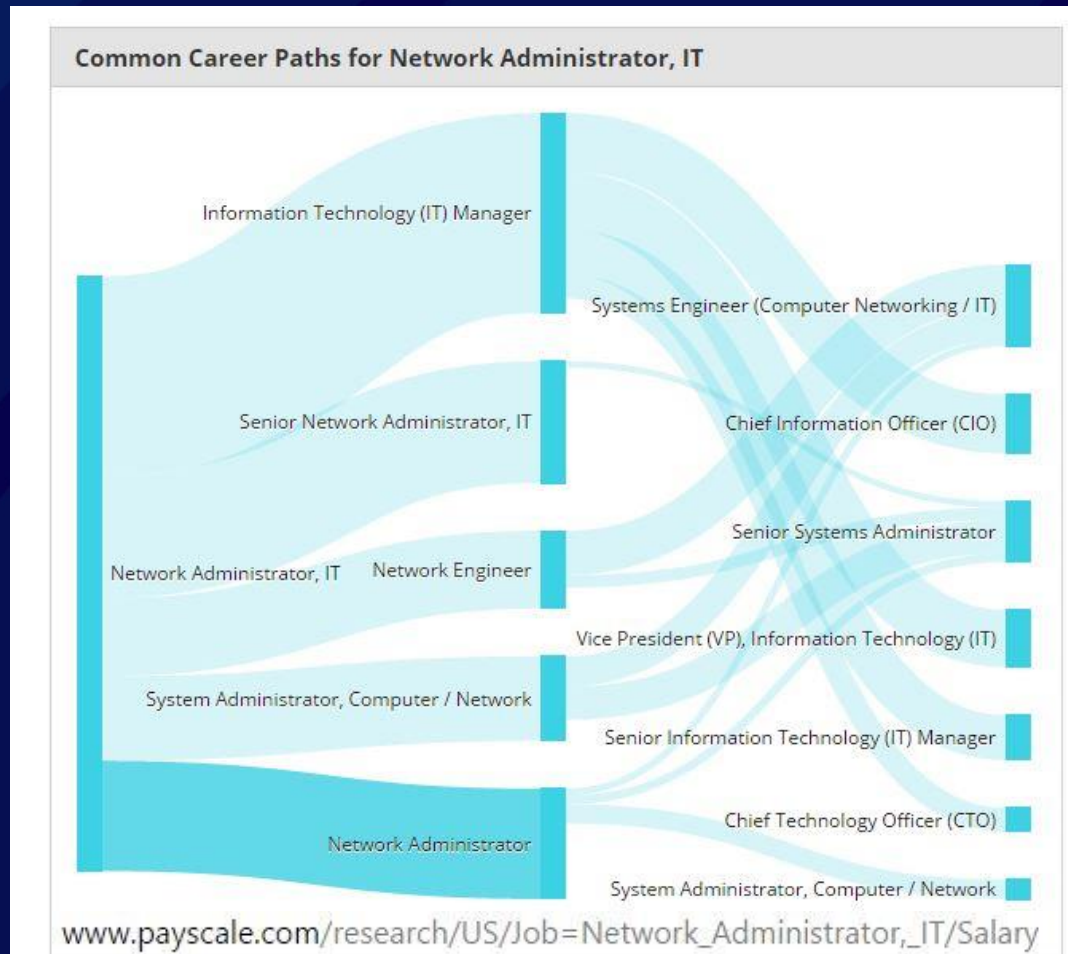


# Careers / Opportunities



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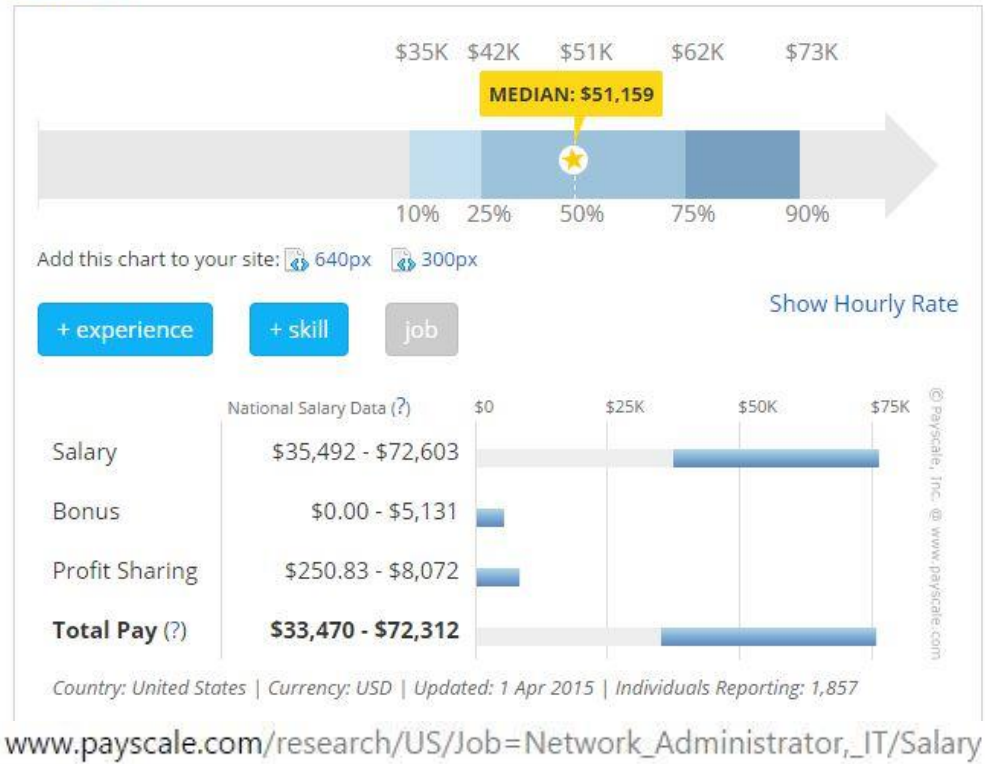
# Careers / Opportunities



# Careers / Network Administrator

## Network Administrator, IT Salary (United States)

Men represent the vast majority of IT Network Administrators in the United States. People in this role can earn an average of \$51K per year nationwide. Total cash compensation to IT [Read More](#)



# Q&A

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