**Network Communications Technology Competency Profile**
**Cisco Networking Academy**

**1.0 Operation of IP Data Networks**

1.1 Recognize the purpose and functions of various network devices such as routers, switches, bridges, and hubs.
1.2 Select the components required to meet a given network specification.
1.3 Identify common applications and their impact on the network.
1.4 Describe the purpose and basic operation of the protocols in the OSI and TCP/IP models.
1.5 Predict the data flow between two hosts across a network.
1.6 Identify the appropriate media, cables, ports, and connectors to connect Cisco network devices to other network devices and hosts in a LAN.

**2.0 LAN Switching Technologies**

2.1 Determine the technology and media access control method for Ethernet networks.
2.2 Identify basic switching concepts and the operation of Cisco switches.
2.3 Configure and verify initial switch configuration including remote access management.
2.4 Verify network status and switch operation using basic utilities such as ping, telnet, SSH.
2.5 Describe how VLANs create logically separate networks and the need for routing between them.
2.6 Configure and verify VLANs.
2.7 Configure and verify trunking on Cisco switches.
2.8 Identify enhanced switching technologies such as RSTP, PVSTP, and Etherchannels.
2.9 Configure and verify PVSTP operation.

**3.0 IP Addressing (IPv4/IPv6)**

3.1 Describe the operation and necessity of using private and public IP addresses for IPv4 addressing.
3.2 Identify the appropriate IPV6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment.
3.3 Identify the appropriate IPv4 addressing scheme using VLSM and summarization to satisfy addressing requirements in a LAN/WAN environment.
3.4 Describe the technological requirements for running IPv6 in conjunction with IPv4. (dual stack)
3.5 Describe IPv6 addresses.

**4.0 IP Routing Technologies**

4.1 Describe basic routing concepts.
4.2 Configure and verify utilizing the CLI to set basic Router configuration.
4.3 Configure and verify operation status of a device interface.
4.4 Verify router configuration and network connectivity using ping, traceroute, telnet, SSH, sh cdp neighbors.
4.5 Configure and verify routing configuration for a static or default router given specific routing requirements.
4.6 Differentiate methods of routing and routing protocols.
4.7 Configure and verify OSPF.
4.8 Configure and verify interVLAN routing (Router on a stick)
4.9 Configure SVI interfaces.
4.10 Manage Cisco IOS Files.
4.11 Configure and verify EIGRP (single AS)

**5.0 IP Services**

5.1 Configure and verify DHCP (IOS Router)
5.2 Describe the types, features, and applications of ACLs
5.3 Configure and verify ACLs in a network environment.
5.4 Identify the basic operation of NAT

5.5 Configure and verity NAT for given network requirements.
5.6 Configure and verify NTP as a client.
5.7 Recognize High availability (FHRP) to include VRRP, HSRP, and GLBP
5.8 Configure and verify syslog
5.9 Describe SNMP v2 and v3.

**6.0 Network Device Security**

6.1 Configure and verify network device security features.
6.2 Configure and verify Switch Port Security.
6.3 Configure and verify ACLs to filter network traffic
6.4 Configure and verify ACLs to limit telnet and SSH access to the router.

**7.0 Troubleshooting**

7.1 Troubleshoot and correct common problems associated with IP addressing and host configurations.
7.2 Troubleshoot and resolve VLAN problems.
7.3 Troubleshoot and resolve trunking problems on Cisco switches.
7.4 Troubleshoot and resolve ACL issues.
7.5 Troubleshoot and resolve layer 1 problems.
7.6 Identify and correct common network problems.
7.7 Troubleshoot and resolve spanning tree operation issues.
7.8 Troubleshoot and resolve routing issues.
7.9 Troubleshoot and resolve OSPF problems.
7.10 Troubleshoot and resolve EIGRP problems.
7.11 Troubleshoot and resolve interVLAN routing problems.
7.12 Troubleshoot and resolve WAN implementation issues.
7.13 Monitor NetFlow statistics.
7.14 TS EtherChannel Problems.

**8.0 WAN Technologies**

8.1 Identify different WAN technologies.
8.2 Configure and verify basic WAN serial connection, PPP, and Frame Relay.
8.3 Troubleshoot PPPoE

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**Network Communications Technology Competency Profile**
**Computer Hardware & Software**

**1.0 Hardware**

1.1 Given a scenario, configure settings and use BIOS/UEFI tools on a PC.
1.2 Explain the importance of motherboard components, their purpose, and properties.
1.3 Compare and contrast various RAM types and their features.
1.4 Install and configure PC expansion cards.
1.5 Install and configure storage devices and use appropriate media.
1.6 Install various types of CPUs and apply the appropriate cooling methods.
1.7 Compare and contrast various PC connection interfaces, their characteristics and purpose.
1.8 Install a power supply based on given specifications.
1.9 Given a scenario, select the appropriate components for a custom PC configuration, to meet customer specifications or needs.
1.10 Compare and contrast types of display devices and their features.
1.11 Identify common PC connector types and associated cables.
1.12 Install and configure common peripheral devices.
1.13 Install SOHO multifunction device/printers and configure appropriate settings.
1.14 Compare and contrast differences between the various print technologies and the associated imaging process.
1.15 Given a scenario, perform appropriate printer maintenance.

**2.0 Networking**

2.1 Identify the various types of network cables and connectors.
2.2 Compare and contrast the characteristics of connectors and cabling.
2.3 Explain the properties and characteristics of TCP/IP
2.4 Explain the common TCP and UDP ports, protocols, and their purpose.
2.5 Compare and contrast various Wi-Fi networking standards and encryption types.
2.6 Given a scenario, install and configure SOHO wireless/wired router and apply appropriate settings.
2.7 Compare and contrast Internet connection types, network types, and their features.
2.8 Compare and contrast network architecture devices, their functions, and features.
2.9 Given a scenario, use appropriate networking tools.

**3.0 Mobile Devices**

3.1 Install and configure laptop hardware and components.
3.2 Explain the function of components within the display of a laptop.
3.3 Given a scenario, use appropriate laptop features.
3.4 Explain the characteristics of various types of other mobile devices.
3.5 Compare and contrast accessories and ports of other mobile devices.

**4.0 Hardware and Network Troubleshooting**

4.1 Given a scenario, troubleshoot common problems related to motherboards, RAM, CPU, and power with appropriate tools.
4.2 Given a scenario, troubleshoot hard drives and RAID arrays with appropriate tools.
4.3 Given a scenario, troubleshoot common video, projector, and display issues.
4.4 Given a scenario, troubleshoot wired and wireless networks with appropriate tools.
4.5 Given a scenario, troubleshoot and repair common mobile device issues while adhering to the appropriate procedures.
4.6 Given a scenario, troubleshoot printer with appropriate tools.

**1.0 Windows Operating Systems**

1.1 Compare and contrast various features and requirements of Microsoft Operating Systems (Vista, Windows 7, Windows 8, 8.1)
1.2 Given a scenario, install Windows PC operating systems using appropriate methods.
1.3 Given a scenario, apply appropriate Microsoft command line tools.
1.4 Given a scenario, use appropriate Microsoft operating system features and tools.
1.5 Given a scenario, use Windows Control Panel utilities.
1.6 Given a scenario, install and configure Windows networking on a client/desktop.
1.7 Perform common preventative maintenance procedures using appropriate Windows OS tools.

**2.0 Other Operating Systems and Technologies**

2.1 Identify common features and functionality of the Mac OS and Linux operating systems.
2.2 Given a scenario, setup and use client-side virtualization.
2.3 Identify basic cloud concepts.
2.4 Summarize the properties and purpose of services provided by networked hosts.
2.5 Identify basic features of mobile operating systems.
2.6 Install and configure basic mobile device network connectivity and email.
2.7 Summarize methods and data related to mobile device synchronization.

**3.0 Security**

3.1 Identify common security threats and vulnerabilities.
3.2 Compare and contrast common prevention methods.
3.3 Compare and contrast differences of basic Windows OS security settings.
3.4 Given a scenario, deploy and enforce security best practices to secure a workstation.
3.5 Compare and contrast various methods for securing mobile devices.
3.6 Given a scenario, use appropriate data destruction and disposal methods.
3.7 Given a scenario, secure SOHO wireless and wired networks.

**4.0 Software Troubleshooting**

4.1 Given a scenario, troubleshoot PC operating system problems with appropriate tools.
4.2 Given a scenario, troubleshoot common PC security issues with appropriate tools and best practices.
4.3 Given a scenario, troubleshoot common mobile OS and application issues with appropriate tools.
4.4 Given a scenario, troubleshoot common mobile OS and application security issues with appropriate tools.

**5.0 Operational Procedures**

5.1 Given a scenario, use appropriate safety procedures.
5.2 Given a scenario with potential environmental impacts, apply the appropriate controls.
5.3 Summarize the process of addressing prohibited content/activity, and explain privacy, licensing, and policy concepts.
5.4 Demonstrate proper communication techniques and professionalism.
5.5 Given a scenario, explain the troubleshooting theory.

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**Network Communications Technology Competency Profile**
**Computer Networking**

**1.0 Network Architecture**

1.1 Explain the functions and applications of various network devices.
1.2 Compare and contrast the use of networking services and applications.
1.3 Install and configure DHCP, DNS, and NAT.
1.4 Explain the characteristics and benefits of various WAN technologies.
1.5 Install and properly terminate various cable types and connectors using appropriate tools.
1.6 Differentiate between common network topologies.
1.7 Differentiate between network infrastructure implementations.
1.8 Given a scenario, implement and configure the appropriate addressing schema.
1.9 Explain the basics of routing concepts and protocols.
1.10 Identify the basic elements of unified communication technologies.
1.11 Compare and contrast technologies that support cloud and virtualization.
1.12 Given a set of requirements, implement a basic network.

**2.0 Network Operations**

2.1 Given a scenario, use appropriate monitoring tools.
2.2 Given a scenario, analyze metrics and reports from monitoring and tracking performance tools.
2.3 Given a scenario, use appropriate resources to support configuration management.
2.4 Explain the importance of implementing network segmentation.
2.5 Given a scenario, install and apply patches and updates.
2.6 Given as scenario, configure a switch using proper features.
2.7 Install and configure wireless LAN infrastructure and implement the appropriate technologies in support of wireless capable devices.

**3.0 Network Security**

3.1 Compare and contrast risk related concepts.
3.2 Compare and contrast common network vulnerabilities and threats.
3.3 Given a scenario, implement network hardening techniques.
3.4 Compare and contrast physical security controls.
3.5 Given a scenario, install and configure a basic firewall.
3.6 Explain the purpose of various network access control models.
3.7 Summarize basic forensic concepts.

**4.0 Troubleshooting**

4.1 Given a scenario, implement the recommended troubleshooting methodology.
4.2 Given a scenario, analyze and interpret the output of troubleshooting tools.
4.3 Given a scenario, troubleshoot and resolve common wireless issues.
4.4 Given a scenario, troubleshoot and resolve common copper cable issues.
4.5 Given a scenario, troubleshoot and resolve common fiber cable issues.
4.6 Given a scenario, troubleshoot and resolve common network issues.
4.7 Given a scenario, troubleshoot and resolve common security issues.
4.8 Given a scenario, troubleshoot and resolve common WAN issues.

**5.0 Industry standards, practices, and network theory**

5.1 Analyze a scenario and determine the corresponding OSI layer.
5.2 Explain the basics of network theory and concepts.
5.3 Given a scenario, deploy the appropriate wireless standard.
5.4 Given a scenario, deploy the appropriate wired connectivity standard.
5.5 Given a standard, implement the appropriate policies of procedures.
5.6 Summarize safety practices.

5.7 Given a scenario, install and configure equipment in the appropriate location using best practices.
5.8 Explain the basics of change management procedures.
5.9 Compare and contrast common ports and protocols.
5.10 Given a scenario, configure and apply the appropriate ports and protocols.




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