Skills Compétences Canada

CONTEST DESCRIPTION

IT Network Systems Administration

POST-SECONDARY

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1 THE SKILLS FOR SUCCESS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY

The Government of Canada has updated the previous Essential Skills framework to the new Skills for Success model in response to the evolving labour market and changing skill requirements. This model outlines nine fundamental skills Canadians need to thrive in work, education, training, and daily life.

Skills/Compétences Canada aims to highlight the importance of these skills, vital for success in trade and technology careers. Competitors can see how Skills for Success are integrated into contest descriptions, projects, and project documents. Recognizing these skills during the competition helps competitors match tasks with specific skills necessary for success and understand how these skills apply within their trade or technology programs and future careers.

The nine key Skills for Success, validated for workplace success, are:

1. Numeracy
2. Communication
3. Collaboration
4. Adaptability
5. Reading
6. Writing
7. Problem Solving
8. Creativity and Innovation
9. Digital

These Skills for Success are detailed in sections 2.3 and/or 3.2 (to be completed by SCC) of your Contest Description and, if relevant, in your Project and supporting documents.

2 CONTEST INTRODUCTION

2.1 Description of the associated work role(s) or occupation(s)

https://www.skillscompetencescanada.com/en/skill_area/it-network-systems-administration/

2.2 Purpose of the Challenge

To evaluate each competitor's skills and to recognize excellence and professionalism in the field of IT network systems administration.

2.3 Duration of contest

12 hours, over 2 days

2.4 Skills and Knowledge to be tested

The competition evaluates a competitor's knowledge of computer and network hardware, and systems administration of Windows and Linux operating systems.[7,9]

Skills for Success – [7]Problem Solving, [9]Digital

3 CONTEST DESCRIPTION

3.1 List of documents produced and timeline for when competitors have access to the documents on the Skills/Compétences Canada website.

DOCUMENT	DATE OF DISTRIBUTION
Release of Reference Architecture Documents	February 2025

3.2 Tasks that may be performed during the contest.

3.2.1 Skills for Success

- Create, interpret and modify textual and graphical documentation[5,6]
- Calculate and apply to a network, an IPv4 and/or IPv6 addressing scheme using subnetting and/or Variable Length Subnet Mask (VLSM)[1,7]
- Troubleshoot hardware and/or software issues with network and/or desktop configuration[7,9]
- Implement, verify and troubleshoot networking device security[7]
- Design a network solution based on a User Requirements document[7]

3.2.2 Technical Communications[2,6]

- Discuss and justify reasons for implementing technical solutions
- Articulate how and why a technical solution was applied
- Provide written communication on root causes
- Provide recommendations to improve infrastructure

3.2.3 Hardware setup and initial configuration[9]

- Identify, install and test hardware components
- Troubleshoot hardware failures[7]
- Install and configure virtual machines
- Use disk, system, and file management tools
- Prepare and manage disk volumes including redundancy

3.2.4 Cyber-Security[1,5,7]

- Utilize third party software to capture network packets
- Analyze logs to determine vulnerabilities
- Configure and hardening of network and desktop equipment
- Identify, and mitigate the effects of malware using third party software

3.2.5 Networking[7, 9]

- Configure, verify, and troubleshoot Local Area Network (LAN), Wide Area Network (WAN), Network Address Translation (NAT) and wireless networking services
- Configure, verify, and troubleshoot IPv4 and IPv6 routing protocols including Routing Information Protocol (RIP), Border Gateway Protocol (BGP), and Open Shortest Path First (OSPF), on Layer 3 devices
- Configure, verify, and troubleshoot route distribution and summarization
- Configure, verify, and troubleshoot spanning-tree operation
- Configure, verify, and troubleshoot ether-channel operation
- Configure, verify, and troubleshoot Virtual Local Area Networks (VLANs) and inter-VLAN communications and protocols
- Configure, verify, and troubleshoot access control lists (ACLs) for IPv4 and IPv6
- Configure, verify, and troubleshoot port security
- Configure, verify, and troubleshoot Virtual Private Network (VPN) tunnels
- Configure network monitoring and make decisions based on gathered data [7]
- Configure, verify, and troubleshoot IOS images and licensing
- Configure, verify, and troubleshoot First Hop Redundancy Protocols (FHRP)

3.2.6 Windows Server Operations[7,9]

- Configure, verify, and troubleshoot Domain Name System (DNS), Dynamic Host Control Protocol (DHCP), and Active Directory (AD)
- Create and perform maintenance of Active Directory objects
- Configure, verify, and troubleshoot infrastructure services and roles
- Configure, verify, and troubleshoot administrative roles
- Configure, verify, and troubleshoot Group Policies
- Configure, verify, and troubleshoot server security, including windows firewall
- Configure, verify, and troubleshoot data provisioning (i.e. shared resources, offline data)
- Configure, verify, and troubleshoot backups and restores
- Enable and configure remote management
- Manage Internet Information Service (IIS) services
- Automate tasks using batch files and PowerShell scripts
- Perform automated server or workstation deployment
- Configure, verify, and troubleshoot Active Directory infrastructure and services
- Configure, verify, and troubleshoot Active Directory Certificate Services
- Manage Server upgrades or migrations including Active Directory services
- Perform virtual machine creation and management tasks using Hyper-V
- Monitor the performance and health of Hyper-V-hosted virtual machines

3.2.7 Linux Server Operations[7,9]

- Configure, verify, and troubleshoot application package management, including custom package sources
- Configure, verify, and troubleshoot network and local storage devices and their respective file systems including RAID
- Configure, verify, and troubleshoot file and directory permissions, special permissions, and ownership
- Configure, verify, and troubleshoot backups and restores
- Configure, verify, and troubleshoot network activity and services[7]
- Configure, verify, and troubleshoot remote management
- Create, modify, and use shell scripts with BASH
- Create, modify, and delete user and group accounts
- Perform job scheduling
- Configure, verify, and troubleshoot HTTP, and FTP services[7]
- Manage runlevels and system initialization from configuration files
- Configure, verify, and troubleshoot system security
- Configure, verify, and troubleshoot server-based network services (e.g., Domain Name Service [DNS], Dynamic Host Control Protocol [DHCP], Server Message Block [SMB])
- Set up environment variables; set process and special permissions
- Implement security auditing for files and authentication
- Configure, verify, and troubleshoot user-level security, such as LDAP and NIS
- Configure user access security with Pluggable Authentication Modules [PAM]
- Perform server security tasks using Linux-based software tools
- Setup and configure server monitoring tools (e.g., Syslog / SNMP)
- Implement email routing systems (e.g., postfix, send mail)
- Install system certificates for application use
- Perform virtual machine creation and management tasks using KVM
- Monitor the performance and health of KVM-hosted virtual machines

Skills for Success – [1]Numeracy, [2]Communication, [5]Reading, [6]Writing, [7]Problem Solving, [9]Digital

4 EQUIPMENT, MATERIAL, CLOTHING

4.1 Equipment and material provided by Skills/Compétences Canada

- Suitable computer hardware
- Cisco Packet Tracer Software (latest version)
- Virtualization software
- Current version of Windows Server (2019 or later) including both *Desktop Experience* and *Core* editions
- Current version of Windows (10 (22H2) or later)
- Current version of Ubuntu (24.04 or later)

- Pen and paper

COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIAL AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.

4.2 Equipment and material provided by the competitor

- Pen and Paper

4.3 Required clothing provided by the competitor

- Competitors must be dressed as appropriate for an office environment.

5 HEALTH AND SAFETY

5.1 Safety program

SCC has implemented a comprehensive safety program as health and safety is an integral part of our competitions. Our safety program includes guidelines and procedures to make the work environment in each skill area safer.

5.1.1 Safety manual

As part of our program a safety manual has been created to monitor and document health and safety within each skill area. It includes a definite plan of action designed to prevent accidents. The safety manual will be provided for every skill and these instructions must be followed and respected by all participants and officials at the SCNC.

5.1.2 Safety workshop

During orientation, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety, and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

5.2 List of required personal protective equipment (PPE) provided by Skills/Compétences Canada

- n/a

5.3 List of required personal protective equipment (PPE) provided by the competitor.

- n/a

6 ASSESSMENT

6.1 Point breakdown

Note: This list is subject to change.

TASKS	/100
Network Troubleshooting	50
User and Server Troubleshooting	50

7 CONTEST SPECIFIC RULES

Contest specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from contest to contest. Any additional contest rules will be reviewed during the competitor orientation.

TOPIC/TASK	CONTEST SPECIFIC RULE
Appropriate use of technology	• Competitors are not allowed to bring USB/memory sticks into the skill area. • Competitors will have limited and supervised access to the Internet during the competition. • Competitors are not allowed to bring personal laptops tablets or mobile phones into the skill area. • Competitors are not allowed the use of any internet-based real-time communication tools or any other tools that facilitate direct communication with outside parties. • Competitors must not communicate between workstations on the local network.
Notes	• Competitors are not allowed to bring any personal notes into the skill area via digital or physical means. All notes taken by the competitor during the competition must remain on the Competitors desk or computer at all times. No notes may be taken outside of the skill area by any means.
Equipment failure	• In the occurrence of equipment failure Competitors must notify the National Technical Committee (NTC) immediately by raising their hand. NTC members will take note of the time that the Competitor is not able to make use of their equipment. Any time lost due to equipment failure will be provided to the Competitor at the end of the standard Module time. • No additional time will be granted for work not saved prior to the equipment failure.
Breaks	• No extra time will be given to Competitors who stop work during competition time to go to the bathroom or for those who break for a food

	and/or drink. When time is completed, all Competitors must stop all work on their computer immediately.
National Technical Committee (NTC) room	• Competitors are not allowed to enter the National Technical Committee meeting room in the skill area

8 ADDITIONAL INFORMATION

8.1 Interpreter

If a competitor requires the help of an interpreter once onsite during the competition, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service may not be guaranteed.

8.2 Ties

- Tiebreaker #1: The competitor with the highest score in the Server module will be declared the winner.
- Tiebreaker #2: The competitor with the highest score in the Networking module will be declared the winner
- Tiebreaker #3: The winner will be determined by demonstrated professionalism and enthusiasm

8.3 Competition rules

Refer to the competition rules of the Skills Canada National Competition which can be found on our website.

9 NATIONAL TECHNICAL COMMITTEE MEMBERS

MEMBER ORGANIZATION	NAME
Newfoundland and Labrador	Charles Reid
British Columbia	Andrew Mueller – Chair
Ontario	John Ulakovich
Manitoba	Gursharn Wander – Co-Chair
Alberta	Gerald Chung
Saskatchewan	Heath Armbruster
New Brunswick	Adam Stapledon

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Nathalie Maisonneuve (nathaliem@skillscanada.com).