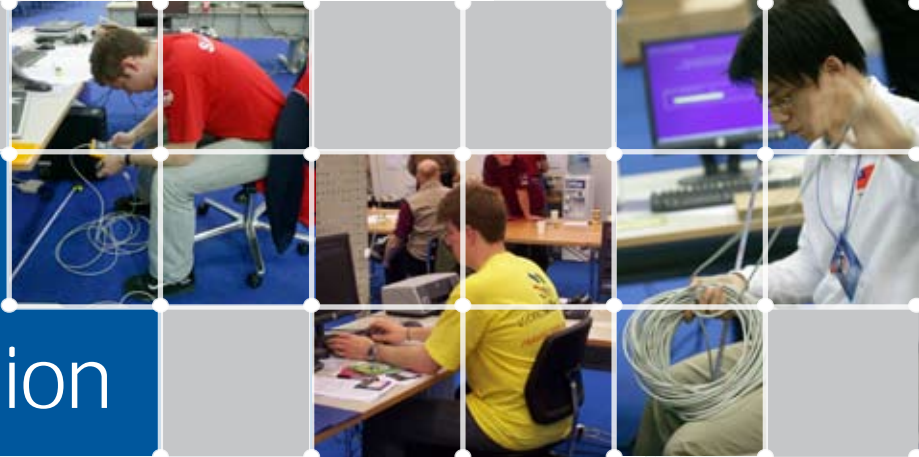


Technical Description



IT PC/Network Support

WorldSkills International, by a resolution of the Technical Committee and in accordance with the Constitution, the Standing Orders and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

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Effective 12.07.09



Liam Corcoran
Technical Committee Chair

1. INTRODUCTION

1.1 Name and description of skill

1.1.1 The name of the skill is **IT PC/Network Support**.

1.1.2 Description of skill

IT PC/Network Support technicians require a wide range of IT skills. This is a fast-moving skill with continuously rising skill levels.

Skills include the ability to:

- Assemble and troubleshoot a complete PC with accessories and network devices for home and business environments
- Install a complex, custom IT solution with workstations, users, servers and networking equipment
- Use a variety of operating systems and server software
- Implement business IT systems with servers, workstations and network devices
- Tackle business-to-business communication solutions, accessing the Internet and other business networks safely and efficiently
- Install and configure wireless network devices, switches, routers and data protection devices
- Ensure security of stored information and give access to relevant users
- Provide system level documentation and diagrams

1.2 Scope of application

1.2.1 Every Expert and Competitor must know this Technical Description.

1.2.2 In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

1.3.1 As this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI - Competition Rules
- WSI - Competition Manual
- WSI - Online resources as indicated in this document
- Host Country - Health and Safety regulations

2. COMPETENCY AND SCOPE OF WORK

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only.

2.1 Competency specification

- Guidelines for suitable levels of skill required are:
 - Microsoft (MCSA)
 - Cisco (CCNA) (CCSP) CompTIA A+ and Network+
 - Linux Professional Institute Level 1
 - Basic wireless network knowledge
 - Basic application skills as applicable
- Competitors do not need to have these qualifications as they are used as a guide only.

- Competitors will be expected to have the ability to carry out the following on hardware and software:
 - fault-find
 - perform diagnostics
 - troubleshoot
- Competitors will be expected to have the ability to perform the following according to specifications:
 - hardware installations
 - network installations
 - configurations
 - maintenance
 - upgrades

2.2 Theoretical knowledge

2.2.1 Theoretical knowledge is required but not tested explicitly.
Theoretical knowledge is limited to that necessary to carry out the project work.

2.2.2 Knowledge of rules and regulations is not examined.

2.3 Practical work

- Assemble a personal computer from its main components.
- Install add-on modules and peripherals for a personal computer. These may include generally available devices that utilize a range of I/O methods.
- Perform hardware upgrades to computer equipment.
- Identify and rectify hardware and software problems.
- Conduct routine procedures on computer equipment, such as:
 - Plan and implement backup procedures.
 - Install and configure virus detection and removal.
 - Design and carry out appropriate system tests for checking system efficiency, reliability and data integrity.
- Install and configure operating systems as required.
- Install software packages to run locally on a personal computer.
- Install software packages to run remotely on a personal computer.
- Install and configure a network, including peer to peer and client/server.
 - Install and configure a network interface card.
 - Connect correct cabling for a LAN.
 - Install and configure a network operating system (NOS).
 - Install and configure appropriate network protocols and client part of NOS.
 - Install and configure network specific devices and services such as email, anti-spam, and anti-virus.
- Administer a LAN / WAN (including advanced user / software / security and hardware configurations)
- Troubleshoot a network including monitoring network performance.
- Create and maintain documentation and diagrams as required.
- Use software diagnostic tools.
- Perform network design and implementation.
- Perform switch, router, firewall and wireless (IEEE) configuration. Implement network security including accounting and authentication. Integrate server and services into a network configuration.

Simulations and scenarios

It is anticipated that competition scenarios may include the assembly of various pieces of hardware to create working pieces of equipment and the installation of software onto this equipment.

3. **THE TEST PROJECT**

3.1 **Format / structure of the Test Project**

The format of the Test Project is modular, with 1 module on each day of the Competition as shown in the following table:

Period	Module	Tasks
1 day	Home computing	Installation, configuration and upgrading
1 day	Small business	
1 day	WAN	
1 day	Network Security and Management	

3.2 **Test Project design requirements**

Each Test Project module must be:

- At a level that a Competitor can comfortably complete
- Designed using a standard cover sheet for each section on the WorldSkills International template available on the website
- Self-explanatory requiring minimal translation (Competitor instructions containing a minimum of text)
- Be accompanied by a marking scheme that will be finalised at the Competition in accordance with the technical description
- All Operating Systems used in the Competition are to be English language versions. Only those Operating Systems & hardware supported in every participating country in the previous Competition may be used
- A variety of techniques may be used for the practical tests: Full day projects, round robin projects and a variety of methods for collection of evidence utilized: For example: Print-outs, screenshots, etc

3.3 **Test Project development**

The Test Project MUST be submitted using the templates provided by WorldSkills International (<http://www.worldskills.org/competitionpreparation>). Use the Word template for text documents and DWG template for drawings.

- 12 months before the Competition, the Chief Expert, Deputy Chief Expert and Jury President will begin the process by contacting the available Experts from the different countries for input into the process.
- They will – in consultation – prepare an up-to-date hardware and software request list for the country hosting the Competition.
- This list will be forwarded to the host country not less than 6 months before the start of the Competition.
- 6 months before the Competition, the Experts under the guidance of the Chief Expert will begin design of the competition outlines and collection of activities suitable for inclusion in the competition. (This collection of activities/ outlines will be available for selection for / inclusion in the final project).
- Any submitted activities / outlines must be accompanied by a suitable marking scheme.
- The current Jury President will have unrestricted access to this process and database of outlines and activities.

3.3.1 Who develops the Test Project / modules

The Test Projects are developed by some Experts. That is those wishing to contribute.

3.3.2 How and where is the Test Project / modules developed

The Test Projects are developed independently by the experts.

Once at the Competition site, each Expert should perform as a member of a team in the preparation of the 30% change to that module.

Four closed groups will be created to be in charge of the development of each of the 4 day's tasks.

Each person allocated to a team will continue in that development team until the task is completed. Experts will be given an opportunity to select their choice of team. However, in cases where the teams are unbalanced, the Chief Expert may recommend and decide that an Expert should join another team.

Test Project Module team leaders

The team leader should be an Expert with previous experience from a WorldSkills competition (whenever possible) and be nominated by the Chief Expert after consultation with the Deputy Chief Expert and Jury President.

It is the responsibility of the team leader to ensure that each module conforms to the Technical Description, complete with proof of testing and a marking scheme.

- 3.3.3 When is the Test Project developed
The Test Project is developed:
 By 3 months before the current Competition

All Experts must send proposed Test Projects to the Chief Expert 3 months before the current Competition. The Chief Expert will publish these Test Project proposals in the Discussion Forum. It is the responsibility of all Experts to access and download the projects submitted. These projects will be voted on by all Experts who contributed a Test Project for that day.

Test Projects will be changed by 30% prior to the Competition as documented in paragraph 3.9.

- 3.3.4 1 month before the Competition the Chief Expert will send all Test Project proposals to the WorldSkills Secretariat for publication on the WS website for download by all participating Members.

3.4 Test Project marking scheme

Each Test Project must be accompanied by a marking scheme proposal based on the assessment criteria defined in Section 5.

- 3.4.1 The marking scheme proposal is developed by the person(s) developing the Test Project. The detailed and final marking scheme is developed and agreed by all Experts at the Competition.
- 3.4.2 Marking schemes should be entered into the CIS prior to the Competition.

3.5 Test Project validation

The Test Project modules will be validated by a Test Group appointed by the Chief Expert as described below.

The amended Test Project modules (30% change) will be passed onto a Test Group who will check each of the selected projects on four complete Competitor workstations. It must be demonstrated that the Test Project/modules can be completed within the material, equipment and knowledge constraints.

The Test Group must check the 30% change / addition and the marking scheme and provide further changes back to the Module Group until agreement is reached and the project is in accordance with 3.2 Test Project design requirements above.

The hardware and software list is correct and is provided for use.

3.6 Test Project selection

The Test Project is selected as follows:

- By vote of Experts on the Discussion Forum who contributed a Test Project for that particular day.

3.7 Test Project circulation

The Test Project is circulated via WorldSkills International website as follows:

The four selected Test Projects modules are sent to the WorldSkills International Secretariat by the Chief Expert at least 3 months before the Competition for publication on the WSI website for download by all participating Members.

3.8 Test Project coordination (preparation for Competition)

Coordination of the Test Project will be undertaken by the Chief Expert and Deputy Chief Expert.

- The Chief Expert assigns at least three (3) Experts (if possible) to each of four Module Groups. Each Module Group is responsible for one Test Project module.
- Each Module Group will be allocated a team leader. The Module Group leader will work closely with the Chief Expert and the Deputy Chief Expert to allow for the completion of the module. The team leader will be responsible for the completion of each module in line with this document and ensure the modules are true and correct.
- The Module Group must add or change a minimum of 30%, produce a marking scheme, and pass the module to the Test Group for validation (see 3.5 Test Project validation).
- Each person allocated to a team will continue in that development team until a replacement from their home country is found or the task is completed.

3.9 Test Project change at the Competition

The Module Group must add or change a minimum of 30% and produce a marking scheme for the module for that day and pass the project to the Test Group for validation (see 3.5 Test Project validation).

<<Please specify which types of things will be considered for change>>

3.10 Material or manufacturer specifications

Not applicable

4. SKILL MANAGEMENT AND COMMUNICATION

4.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration and decision making regarding the skill must take place on the skill-specific Discussion Forum (<http://www.worldskills.org/forums>). All skill-related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be moderator for this forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

4.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (<http://www.worldskills.org/competitorcentre>).

This information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Other Competition-related information

4.3 Test Projects

Circulated Test Projects will be available from [worldskills.org](http://www.worldskills.org) (<http://www.worldskills.org/testprojects>) and the Competitor Centre (<http://www.worldskills.org/competitorcentre>).

4.4 Day-to-day management

The day-to-day management is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalised at the Competition (agreed by Experts and submitted to the Chair/Vice Chair of the Technical Committee). The Chief Expert is to regularly share updates of the Skill Management Plan via the Forum.

5. ASSESSMENT

This section describes how the Experts will assess the Test Project / modules. It also specifies the assessment specifications and procedures and requirements for marking.

5.1 Assessment criteria

This section defines the assessment criteria and the number of marks (subjective and objective) awarded. The total number of marks for all assessment criteria must be 100.

Section	Criterion	Marks		
		Subjective (if applicable)	Objective	Total
A	Home computing	0	25	25
B	Small business	0	25	25
C	WAN	0	25	25
D	Network Security and Management	0	25	25
Total =		0	100	100

5.2 Subjective marking

[Not applicable](#)

5.3 Skill assessment specification

[The Module Groups of Experts for each day will decide on the marking criteria.](#)

The following is not a definitive list but is an example of possible aspects which will be assessed:

- RAID 1 mirrors exist
- 5 SCSI Hard disk detected
- Second hard disk contains two partitions
- Both 10GB in size, formatted and ready to use no DNS timeout
- Backup includes drive D
- Backup includes system state
- Backup includes /usr/local or files representing it
- Backup schedule show one full backup per week and differential on other days
- Above scheduled for 12pm everyday
- Linux install completed
- DNS forwarder set to Linux
- All DNS root hints cleared
- DHCP Range created and correct
- Default gateway 192.168.1.1
- DNS 192.168.1.2
- DHCP Lease time 2 days
- Domain in 2003 Native Mode

- TSWeb installed
- TSWeb only listen / respond on VPN range.
- IPP Installed
- IPP Installed On default website
- RRAS setup and set to VPN server. Printouts / Scripts

5.4 Skill assessment procedures

The Competitor's work may not be altered in any way to facilitate marking unless included in the marking scheme.

The Experts attending the Competition will be divided into marking groups to mark each specific section of the marking criteria.

Progressive marking for all sections of the Competition

Each module / task / section will be completed on the assigned day so that progressive marking can take place

Marking scheme

- Each Competitor is provided with an overview of the marking scheme.
- A full marking scheme will only be seen by the Experts. (Reason: The full marking scheme would give the answers to the Competitor.)

6. **SKILL-SPECIFIC SAFETY REQUIREMENTS**

Refer to Host Country Health & Safety documentation for Host Country regulations.

- When Competitors work with a dismantled computer, the power cord must be disconnected from the computer.
- Competitors must use ESD (electrostatic discharge) protection during work on the dismantled computer or component.

7. **MATERIALS & EQUIPMENT**

7.1 Infrastructure List

The Infrastructure List lists all equipment, materials and facilities provided by the Host Country.

The Infrastructure List is online (<http://www.worldskills.org/infrastructure/>).

The Infrastructure List specifies the items & quantities requested by the Experts for the next Competition. The Host Country will progressively update the Infrastructure List specifying the actual quantity, type, brand/model of the items. Host Country supplied items are shown in a separate column.

At each Competition, the Experts must review and update the Infrastructure List in preparation for the next Competition. Experts must advise the Secretary General of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

7.2 Materials, equipment and tools supplied by Competitors in their toolbox

Three keyboards and three mice each.

The keyboards must be supported by the software used in the Competition.

7.3 Materials, equipment and tools supplied by Experts

Experts are not required to supply any materials, equipment or tools.

7.4 Materials & equipment prohibited in the skill area

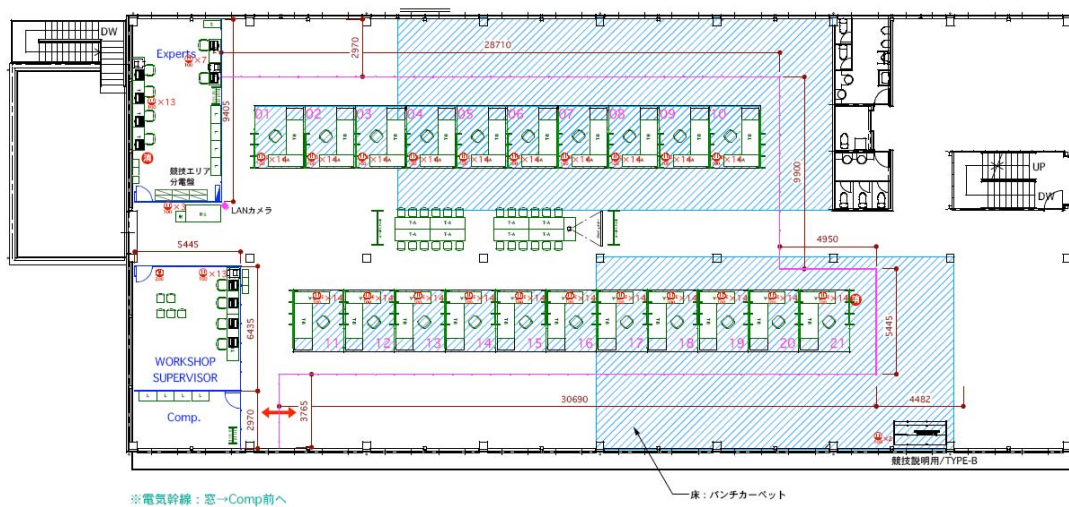
Electronic devices such as cell phones, media players, recorders are not permitted in the skill area.

7.5 Sample workshop and workstation layouts

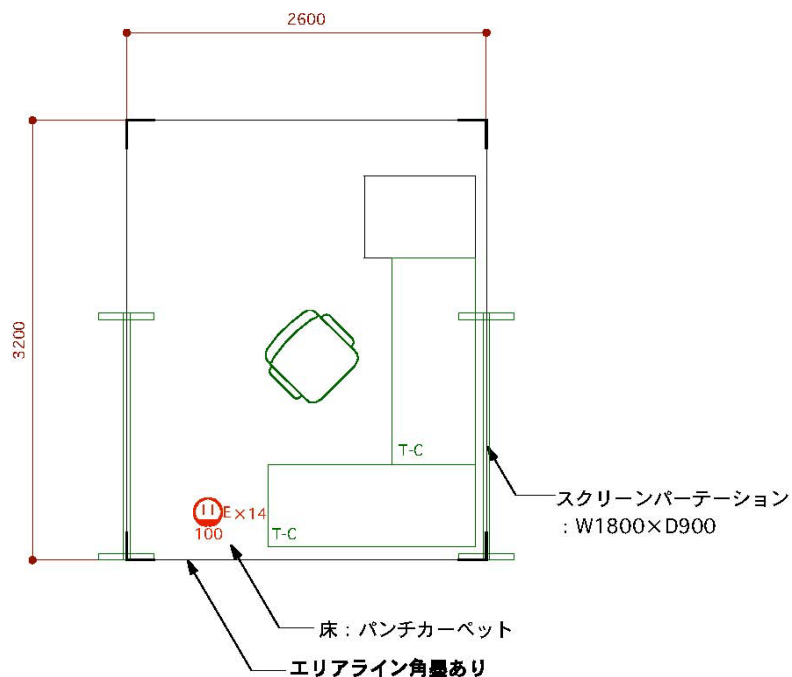
Workshop and workstation layouts from Shizuoka are available at:

http://www.worldskills.org/index.php?option=com_halls&Itemid=318

Workshop layout from Japan Competition:



Workstation layout from Japan Competition:



8. MARKETING THE SKILL TO VISITORS AND MEDIA

8.1 Maximising visitor and media engagement

The following will be exhibited to the public to generate interest in the trade:

- Video description of trade. For example: “Warriors of the Net”
- Dual displays – public can observe work being done by competitor in detail
- Test Project descriptions
- Competitor profiles
- Career opportunities
- Daily reporting of competition status

8.2 Sustainability

- Workstations will be organized into 4 islands corresponding to the skill sets (Day 1 – 4) being tested. Competitors will be divided into these 4 groups for the purpose of reducing the need for a large number of networking devices.