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# CIE IT Skills System Requirements

## 1. Introduction

CIE's IT Skills testing software is based on NCC's ATS assessment engine, as NCC is CIE's software developer for the IT Skills testing software. This document details the recommended minimum hardware and operating system requirements for the efficient operation of NCC's Automated Testing Software (ATS). All of these system requirements also apply to CIE IT Skills testing software. This document covers all the major areas of IT infrastructure. You should refer to the CIE Technical Helpline if you are uncertain about any aspect of this document.



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### 3. PC Workstation Hardware

CIE/NCC recommend as a preferred minimum specification for the CIE IT SKILLS product:

- Pentium P166 (PII or higher recommended) PC.
- 32MB memory (RAM) (64 Recommended)
- 100Mb available hard disk drive (HDD) capacity.
- 8 x CD-ROM (or higher)
- Display resolution of 256 colours (16 bit True recommended). Display 800 X 600 (1024 X 768 recommended)
- Floppy Disk Drive

CIE/NCC recommend:

- Good quality branded hardware components.
- Intel chipsets for Intel compatible motherboards.
- AMD/VIA chipsets for AMD compatible motherboards.

CIE/NCC **cannot** assist clients where operating systems fall below the minimum requirements.

### 4. PC Workstation Operating Systems

Please refer to *Appendix E: Microsoft Windows Operating Systems* for more information, and in particular for operating systems marked with an asterisk.

CIE IT SKILLS is compatible with:

- Microsoft Windows XP Professional.
- Microsoft Windows 2000 Professional.
- Microsoft Windows Millennium Edition (ME)\*.
- Microsoft Windows NT Workstation 4.0 (Fully Patched)\*.
- Microsoft Windows 98 SE.
- Microsoft Windows 98.
- Microsoft Windows 95 (Fully Patched)\*.

CIE/NCC recommend:

- Microsoft Windows XP/2000 Professional (Fully Patched)\*.
- Microsoft Windows NT Workstation 4.0 (Fully Patched)\*.
- Microsoft Windows 98 SE.

\* See *Appendix E: Microsoft Windows Operating Systems*.



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CIE/NCC do **not** recommend and will **not** support:

- Microsoft Windows 95 (Fully Patched)\*.
- Microsoft Windows NT Workstation 3.51\*.
- Windows Emulators (e.g. Soft Windows).

CIE IT SKILLS is incompatible with:

- Microsoft Windows 3.11.
- Microsoft Windows 3.1.
- UNIX.
- LINUX.

\* See *Appendix E: Microsoft Windows Operating Systems*.

## 5. Networks

### 5.1. Network Types

CIE IT SKILLS is compatible with:

- Windows Peer-To-Peer Networks\*\*.
- Local Area Networks (LANs)\*\*\*.

\*\* See *Appendix A: Windows Peer-To-Peer Networks*.

\*\*\* See *Appendix B: Local Area Networks (LANs)*.

### 5.2. Network Cabling

CIE IT SKILLS is compatible with:

- BNC (Thin Net) cabling.
- Category 4 UTP cabling.
- Category 5 UTP cabling.
- Category 5E UTP cabling.
- Category 6 UTP cabling.

CIE/NCC recommend:

- Category 5E UTP cabling.
- Category 6 UTP cabling

CIE/NCC do **not** recommend:

- BNC (Thin Net) cabling.
- Category 4 UTP cabling.



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CIE IT SKILLS is incompatible with:

- Cabling exceeding recommended maximum theoretical length.
- Cabling which is physically damaged.
- Cabling which is prone to physical damage due to location.
- Cabling which is not fully isolated from possible conflicting devices.
- Nested hubs or switches.

### **5.3. Network Topology**

CIE/NCC recommend:

- Fast Ethernet (100Mbit).
- Single 'Star' configuration.

CIE/NCC do **not** recommend:

- ARCnet
- Baseband
- Token Ring topology

### **5.4. Network Maintenance**

CIE/NCC recommend:

- Networks administered by competent personnel.
- Networks serviced regularly by competent personnel.
- Network servers located securely.
- Network servers backed up and rebooted regularly.
- Group policy and profiles giving required access to the users 'Desktop' environment\*.

\* See Appendix G

### **5.5. Network Cards**

CIE/NCC recommend:

- Good quality, branded (Intel, 3COM) 100Mbit network cards\*.

\* Good quality, branded (Intel, 3COM) 10Mbit network cards may be used exceptionally for small, low-traffic local area networks.



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## **5.6. Network Hubs and Switches (Switched Hubs)**

CIE/NCC recommend:

- Good quality, branded network hubs (100Mbit) and switches (100Mbit)\*.

\* Good quality, branded (Intel, 3COM) 10Mbit network hubs and switches may be used exceptionally for small, low-traffic local area networks.



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## 6. Appendix A: Windows Peer-to-Peer Networks

### 6.1. Windows Peer-to-Peer Network Hardware

CIE/NCC recommend:

- An absolute maximum of 9 workstations in any Windows Peer-to-Peer network.
- A dedicated Windows Peer-to-Peer server, which is not also used as a client workstation.

### 6.2. Windows Peer-to-Peer Network Operating Systems

Please refer to *Appendix E: Microsoft Windows Operating Systems* for more information, and in particular for operating systems marked with an asterisk.

CIE IT SKILLS is compatible with:

- Microsoft Windows XP Professional.
- Microsoft Windows 2000 Professional.
- Microsoft Windows NT 4.0 (Fully Patched).
- Microsoft Windows 98 SE.
- Microsoft Windows 98 (Fully Patched).
- Microsoft Windows 95 (Fully Patched)\*.

CIE/NCC recommend:

- Microsoft Windows 2000 Professional.
- Microsoft Windows XP.
- Microsoft Windows NT 4.0 (Fully Patched).
- Microsoft Windows 98 SE.

CIE/NCC do **not** recommend and will **not** support:

- Microsoft Windows 95 (Fully Patched)\*.
- Microsoft Windows NT 3.51\*.
- Microsoft Windows Millennium Edition (ME)\*.

\* See *Appendix E: Microsoft Windows Operating Systems*.

Note: CIE/NCC do **not** recommend installing CIE IT SKILLS on peer-to-peer networks comprising one or more Windows 2000 Professional workstations connected to a Windows 9x peer server. In this case, one Windows 2000 Professional workstation must be deployed as the dedicated peer server.



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CIE IT SKILLS is currently incompatible with:

- Microsoft Windows 3.11.
- Microsoft Windows 3.1.
- Microsoft Windows for Workgroups.
- UNIX.
- LINUX.
- Windows Emulators (e.g. Soft Windows)

### **6.3. Windows Peer-to-Peer Network Protocols**

CIE/NCC recommend:

- TCP/IP network protocol.

CIE/NCC do **not** recommend:

- NETBEUI network protocol

If the NETBEUI protocol is installed but not intended to be in use, then it should be uninstalled to reduce network traffic. CIE/NCC recommend that only suitably competent personnel should perform this operation and that the alternative network protocol configuration is checked to be correct before the removal of the NETBEUI protocol.





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## 7. Appendix B: Local Area Networks (LANs)

### 7.1. LAN Server Operating Systems

Please refer to *Appendix C: Novell Netware* or *Appendix D: Microsoft Windows Network Operating Systems* for more information.

CIE IT SKILLS is compatible with:

- Novell Netware Version 3.12 to Version 6.0 (fully patched).
- Microsoft Windows NT Server Version 4.0.
- Microsoft Windows 2000 Server.
- Microsoft Windows 2000 Advanced Server.

CIE/NCC recommend:

- Novell Netware Version 6.0 (fully patched).
- Microsoft Windows NT Server Version 4.0.
- Microsoft Windows 2000 Server.
- Microsoft Windows 2000 Advanced Server.

CIE/NCC do **not** recommend:

- Server Emulations (e.g. SAMBA).
- LINUX.
- Microsoft Windows NT Terminal Server Version 4.
- Microsoft Windows NT Server Version 3.51.
- Terminal Services for Windows 2000
- CITRIX WINFRAME.
- CITRIX METAFRAME.

CIE IT SKILLS is incompatible with:

- Unix



## 8. Appendix C: Novell Netware Network Operating Systems (Netware 3.x not supported)

### 8.1. Novell Netware Server Hardware

Novell recommends the following minimum requirements for Netware Versions 3.x and 4.x:

- A server class PC with a 386, 486 (SX or DX), Pentium or higher processor.
- 20MB of RAM.
- VGA or higher resolution display adapter (SVGA recommended).
- A DOS partition of at least 15Mb and 15MB available space.
- 90MB of available hard disk space outside the DOS Partition for volume SYS:
- At least one network board.
- CD-ROM Drive that can read formatted CD-ROM disks.
- A PS/2 or serial mouse (recommended).

Novell recommends the following minimum requirements for Netware Versions 5.0 and 5.1:

- A server class PC with a Pentium II or higher processor.
- 128MB of RAM.
- VGA or higher resolution display adapter (SVGA recommended).
- A DOS partition of at least 50Mb and 35MB available space.
- 750MB of available hard disk space outside the DOS Partition for volume SYS:
- One network board.
- A CD-ROM drive (bootable CD-ROM drives must support the El Torito specification).
- A PS/2 or serial mouse (recommended).

Novell recommends the following minimum requirements for Netware Version 6:

- A server class PC with a Pentium II or AMD K7 processor.
- 256MB of RAM.
- A Super VGA display adapter.
- A DOS partition of at least 200Mb and 200MB available space.
- 2GB of available hard disk space outside the DOS Partition for volume SYS:
- One network board.
- A CD-ROM drive.
- A USB, PS/2 or serial mouse (recommended but not required).



## 8.2. Novell Netware Operating System

CIE IT SKILLS is compatible with:

- Novell Netware Version 4.x (fully patched) onwards.\*
- Netware Client (Client 32) Version 2.5 (fully patched) onwards.\*

CIE/NCC recommend:

- Novell Netware Version 4.2 (fully patched) or higher.\*
- Netware Client (Client 32) Version 3.31 for Windows 98\*\*.
- Netware Client (Client 32) Version 4.81 for Windows NT/2000\*\*.
- Netware Client (Client 32) Version 4.82 for Windows XP\*\*.

CIE/NCC do **not** recommend:

- Netware Client (Client 32) Version 2.4 to 3.x or earlier.
- Microsoft Client (provided with Microsoft Windows 95 and Windows 98).

\* Patches may be downloaded from the Novell web site [www.novell.com](http://www.novell.com). CIE/NCC recommends that only suitably competent personnel should carry out this installation. For Netware Client (Client 32) versions higher than V2.5 on Novell Netware Version 4 or above, patches may need to be applied to the server.

\*\* Opportunistic Locking was disabled in the release of Client32 V2.5 (Novell released a patch for previous versions of the client for those who wanted to turn off Opportunistic Locking). In the Version 3 release of Client 32, the setting for Opportunistic Locking is listed in the 'Advanced settings' of the client. CIE/NCC recommend turning off Opportunistic Locking, if the client is version 3 or above.



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### **8.3. Novell Netware Settings**

CIE/NCC recommend:

- True Commit = On\*

\* If data corruption is absent with True Commit set to Off, then the following settings may be applied (at your own risk) to boost network performance. CIE/NCC accept no liability for data corruption caused by switching True Commit to Off:

- True Commit = Off.
- Cache Writes = Off.
- Close Behind Ticks = 0.
- Delay Writes = Off.

Setting recommendations apply to each terminal on any Novell Network and are accessible by right clicking on Network Neighbourhood, selecting Properties, Netware Client, Properties, and then Advanced Settings.

### **8.4. Novell Netware Network Protocols**

CIE/NCC recommend:

- TCP/IP Network Protocol.
- IPX/SPX Network Protocol.



## 9. Appendix D: Microsoft Windows Network Operating Systems

### 9.1. Microsoft Windows NT Server Operating System

#### 9.1.1. Microsoft Windows NT Server Hardware

Microsoft recommends as a minimum specification:

- A server class PC with a 486 DX 33 MHz, Pentium or higher processor.
- 16 Mb memory (RAM).
- 125 Mb Available Hard Disk Drive (HDD) Space.
- CD-ROM Drive.
- VGA, Super VGA or video graphics adapter compatible with Windows NT Server 4.0.

CIE/NCC recommend as a minimum specification:

- A server class PC with a Pentium PRO 200 or higher processor.
- 128 Mb memory (RAM).
- 3 Gb Available SCSI Hard Disk Drive (HDD) Space.
- CD-ROM Drive.
- VGA, Super VGA or video graphics adapter compatible with Windows NT Server 4.0.

#### 9.1.2. Microsoft Windows NT Server Operating System

CIE/NCC recommend as a minimum specification the application of the following patches by suitably qualified personnel:

- NT Server Version 4.0 Service Pack 5\*.
- Year 2000 compliance patches\*.
- NTServer.reg\*\*

Note: Microsoft has discontinued support of all versions of the Windows NT Server operating system (online support only available). CIE/NCC no longer support CIE/NCC IT SKILLS/ATS on Windows NT Server Version 3.51.

\* Microsoft service packs and patches are available from the Microsoft web site, [www.microsoft.com](http://www.microsoft.com). CIE/NCC recommend that only a suitably qualified engineer should carry out this installation.

\*\*NTServer.reg turns off Opportunistic Locking. This may also be done by manually amending the registry.



### 9.1.3. Microsoft Windows NT Server Network Protocols

CIE/NCC recommend:

- TCP/IP Network Protocol.

## **9.2. Microsoft Windows 2000 Server and Advanced Server Operating Systems**

### 9.2.1. Microsoft Windows 2000 Server and Advanced Server Hardware

Microsoft recommends as a minimum specification:

- A server class PC with a Pentium 133 or higher processor.
- 128 Mb memory (RAM).
- 2 Gb Hard Disk Drive (HDD) with 1Gb available Space.
- CD-ROM Drive.
- VGA, Super VGA or video graphics adapter compatible with Windows 2000 Server.

CIE/NCC recommend as a minimum specification:

- A server class PC with a Pentium PII 350 or higher processor.
- 256 Mb memory (RAM).
- 10 Gb Available SCSI Hard Disk Drive (HDD) Space.
- CD-ROM Drive.
- VGA, Super VGA or video graphics adapter compatible with Windows 2000 Server.

### 9.2.2. Microsoft Windows 2000 Server and Advanced Server Operating Systems

CIE/NCC recommend as a minimum specification the application of the following patches by suitably qualified personnel:

- Windows 2000 Service Pack 2\*.

\* Microsoft service packs and patches are available from the Microsoft web site, [www.microsoft.com](http://www.microsoft.com). CIE/NCC recommend that only a suitably qualified engineer should carry out this installation.

### 9.2.3. Microsoft Windows 2000 Server and Advanced Server Network Protocols

CIE/NCC recommend:

- TCP/IP Network Protocol.



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## 10. Appendix E: Microsoft Windows Operating Systems

### 10.1. Microsoft Windows XP Professional Operating System

- No patches need be applied.

### 10.2. Microsoft Windows 2000 Professional Operating System

CIE/NCC recommend as a minimum specification the application of the following patches by suitably qualified personnel:

- Windows 2000 Service Pack 1\*.

\* Microsoft service packs and patches are available from the Microsoft web site, [www.microsoft.com](http://www.microsoft.com). CIE/NCC recommends that only a suitably qualified engineer should carry out this installation.

CIE/NCC do **not** recommend and will **not** support the CIE IT SKILLS on peer-to-peer networks comprising one or more Windows 2000 Professional workstations connected to a Windows 9x peer server. In this case, one Windows 2000 Professional workstation must be deployed as the dedicated peer server.

### 10.3. Microsoft Windows Millennium Edition (ME) Operating System

Windows ME has been designated by Microsoft as for home use and is not intended as a business operating system. As a result, CIE/NCC do not recommend and will not support CIE IT SKILLS on Windows ME.

### 10.4. Microsoft Windows NT Workstation Operating System

CIE/NCC recommend as a minimum specification the application of the following patches by suitably qualified personnel:

- NT Workstation Version 4.0 Service Pack 5.
- Year 2000 compliance patches\*.
- NTServer.reg\*\*.

Note: Microsoft discontinued support of Version 3.51 of the Windows NT Workstation operating system as of December 31, 2001. As a result, CIE/NCC do not recommend and will no longer support CIE/NCC IT SKILLS/ATS on Windows NT Workstation Version 3.51.

\* Microsoft service packs and patches are available from the Microsoft web site, [www.microsoft.com](http://www.microsoft.com). CIE/NCC recommend that only a suitably qualified engineer should carry out this installation.

\*\* NTServer.reg turns off Opportunistic Locking. This may also be done by manually amending the registry.



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## **Microsoft Windows 98 Operating System**

### 10.4.1. Microsoft Windows 98 SE

- No patches need be applied.

### 10.4.2. Microsoft Windows 98

- Microsoft Windows 98 (Fully Patched including Year 2000 compliance patches)\*.

\* Microsoft service packs and patches are available from the Microsoft web site, [www.microsoft.com](http://www.microsoft.com). CIE/NCC recommend that only a suitably qualified engineer should carry out this installation.

### 10.4.3. Microsoft Windows 95 Operating System

Microsoft discontinued support of the Windows 95 operating system as of November 30, 2001. As a result, CIE/NCC do **not** recommend and can **no longer** support CIE/NCC IT SKILLS/ATS on Windows 95.





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## 11. Appendix F: Microsoft Office

CIE/NCC IT SKILLS/ATS is compatible with:

- Microsoft Office XP (CIE IT SKILLS Ver 5.4).
- Microsoft Office 2000 Standard.
- Microsoft Office 2000 Professional.
- Microsoft Office 97.

CIE/NCC recommend:

- Microsoft Office XP Professional.
- Microsoft Office 2000 Standard.
- Microsoft Office 2000 Professional.
- Microsoft Office 2000.

CIE/NCC also still support Microsoft Office 97 Professional.

CIE IT SKILLS is incompatible with:

- Microsoft Office for Windows Version 6.x and earlier.

## 12. Appendix G

**Permissions for MS Office and CIE IT SKILLS Applications and Folders (including the Data Folder).**

CIE/NCC recommend:

- Full User/Candidate access to all office applications (Full Control)
- Full Access to the Registry Keys (including Sub keys) for these applications (Full Control)
- Complete access to the Windows Desktop environment (profiles and Group Policy can be used to remove visible applications if necessary).



## 13. Appendix H

### 13.1. Group Policy, Roaming Profiles and Local security settings

In configuring Network, Active directory and NTFS permissions security settings it is important that a thorough understanding of Group policy and security is applied over a network. Where security infringes on the permissions outlined above the CIE IT SKILLS software may not function correctly.

Special care needs to be taken in applying Group policy and Active Directory permissions (Win 2K & XP) to:

- Users
- Domains
- Local Computers
- Organisational Units
- Active Directory (includes the configuration of AD sites and services)

### 13.2. Workstations - NT4, Windows 2000 Professional and XP

When configuring these types of 'local' machines extra care should be taken to ensure that Domain assigned security settings flow correctly to the local workstations. At logon globally assigned Group Policy and security should take precedence over local machine settings to ensure conflicts do not arise.

Where these types of machines are not connected to a network local security policy may need configuring prior to the operation of CIE IT SKILLS software.

For further advice on network organisation and security visit [www.microsoft.com](http://www.microsoft.com)

## 14. Disclaimer

- Recommendations are for guidance only and CIE/NCC cannot guarantee that recommendations given are accurate or current.
- All recommendations assume an average intensity of use for networks and operating systems. CIE/NCC recommendations may be insufficient for increased intensity of usage.
- All recommendations assume that only CIE IT SKILLS is in use and recommendations given may be insufficient where other software is also in use.
- If other software is also in use please refer to the appropriate vendor for system requirements.
- All recommendations for servers assume running one server only on the same machine and recommendations may be insufficient where additional servers are installed.
- CIE/NCC recommend that all installation, configuration and maintenance of hardware and software should be carried out by suitably qualified engineers.
- All device drivers should be kept up to date as appropriate by suitably qualified engineers.
- All recommendations for operating system service packs and patches are subject to third-party updates.
- Data backups should be carried out regularly using appropriate data backup devices.
- Your data is at risk of corruption if your hardware and operating systems do not meet these requirements.

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