

Palestinian Civil Police

ICT related equipment technical specifications

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1 General requirements

1.1 Purpose

This standard defines IT equipment for PCP work areas.

Its purpose is to ensure the employees have at their disposal standardized ICT hardware and software which is sufficient and enables performing their duties.

1.2 Minimum specifications

These are minimum specifications. Equipment offered by vendors may exceed the minimum, but it will not give any advantage when comparing the offers.

1.3 Information

- Provide a description, including manufacturer and product name, of the equipment you are offering.
- Complete specifications must be provided for each product.
- Complete spare parts lists with part numbers must be supplied
- Procedure of obtaining the spare parts.
- Operating instructions
- Maintenance manuals
- If multiple products are offered, and should be considered for this tender, please provide a separate and complete response for each product.

1.4 Supplier

Supplier must be certified by the manufacturer or the authorized representative.

1.5 Quality

Quality shall be of the best grade for each type or class of material or equipment, even though such quality may not be stated specifically in the specifications. All materials and products shall be new and manufactured by well known firms and shall be sound and uniform in quality, size, shape, color and texture and shall be free from cracks, warpage or other defects. Energy consuming equipment shall be of the energy saving type, wherever relevant and applicable.

1.6 Security clearances

The Contractor's employees, who are required to enter security installations or gain access to sensitive/confidential information in order to perform work under

the Contract, will be required to obtain appropriate security clearance. The Contractor must obtain security clearances for his employees and employees of subcontractors and for any person sent on the Contractor's behalf to work on the project in advance and to undertake to obtain such security clearances in a manner that causes no delay to performance of the work.

System maintenance, or any other activity relating to the Contract, will be performed exclusively by individuals who underwent appropriate security clearance and have received PCP approval.

1.7 Warranty and service

After sales service declaration: The supplier must declare and guarantee service in all Palestinian Authority territories.

All items must have a minimum warranty period of 12 months with return to vendor. Different requirements may be specified for each item, which will take precedence.

For items which include installation, warranty response time must be next business day, on-site.

Vendor must describe the warranty coverage in case:

- vendor ceases trading
- vendor ceases to represent the manufacturer of the items provided

Vendor must explain the warranty callout procedure.

1.8 Equipment Cost

Specify the unit price of the equipment.

1.9 Maintenance Cost

Specify the maintenance price of the equipment. Include a specification of the maintenance programs.

2 General items

2.1 Air conditioning

2.1.1 Air conditioning (1)

- Split unit
- Including installation of the unit and power socket in necessary
- 220v model, single phase
- Cooling power: 4 KW (14000 BTU)
- Operating mode: must guarantee operation without failure if running

continuously at maximum capacity.

- Warranty: 12 months, on-site repair

2.1.2 Air conditioning (2)

- Split unit
- Including installation of the unit and power socket in necessary
- 220v model, single phase
- Cooling power: 10 KW (33000 BTU)
- Operating mode: must guarantee operation without failure if running continuously at maximum capacity.
- Warranty: 12 months, on-site repair

2.2 Doors

General requirement for doors:

- frame included
- lock included (Mul-T lock type or similar)
- readiness for electronic lock in both door and the frame
- other security measures: multiple additional strikes vertically and horizontally
- without doorsill
- automatic closing mechanism, guaranteed closing without assistance
- choice of either inward or outward opening
- choice of either left or right hinged
- installation included:
 - adjusting the opening in the wall regardless of material (concrete, brick, wood, plaster, etc.)
 - mounting the door and all installation material
 - finishing the internal decoration to match the surrounding
- warranty: 12 months from installation, on site repair

2.2.1 Door (1)

- opening size 2100 x 910 mm
- material: full wood (sandwich or pressed not allowed)

2.2.2 Door (2)

- opening size 2100 x 910 mm

- material: metal
- protection level: LPS 1175 SR 3 for door and lock

2.2.3 Door (3)

- opening size: 2280 x 1820 mm
- material: metal
- door with two sides, without center post
- protection level: LPS 1175 SR 3 for door and lock

2.3 Various items

2.3.1 Extension cable (1)

- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Length: 5M

2.3.2 Extension cable (2)

- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Length: 10M

2.3.3 Multiple socket extension cable (1)

- with switch
- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Cable connected to the sockets using screws. Joints made by welding not accepted.
- Length: 1.5m
- 6 sockets

2.3.4 Multiple socket extension cable (2)

- with switch
- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Cable connected to the sockets using screws. Joints made by welding not accepted.

- Length: 3m
- 6 sockets

2.3.5 Multiple socket extension cable (3)

- with switch
- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Cable connected to the sockets using screws. Joints made by welding not accepted.
- Length: 5m
- 6 sockets

2.3.6 Multiple socket extension cable (4)

- with switch
- Rating: 220V 16A
- Cable type: 2.5mm diameter
- Cable connected to the sockets using screws. Joints made by welding not accepted.
- Length: 10m
- 6 sockets

2.3.7 Lamp

- Portable
- With battery backup for 2 hrs
- Power source: 220v

3 Fire extinguishers

General requirements for fire extinguishers:

- Fire extinguisher: non-toxic, non-corrosive; gas or aerosol.
- Is designed for and will not damage computer rooms, servers and other sensitive equipment.
- Will not harm personnel.

3.1 Fire extinguisher (1)

- Manual activation and use, handheld model.
- Protected volume 30m³.

3.2 Fire extinguisher (2)

- Type: (HFC-227ea / FE-227 or similar)
- Automatic activation with smoke detector.
- Protected volume 30m³.
- Installation included.
- Warranty 12 months, on-site repair.
- Maintenance and testing procedure explanation included.

4 Tools

4.1 Cable Tools

4.1.1 Cable crimp tool (RJ11 and RJ45)

4.1.2 Krone tool

4.2 Screwdrivers

4.2.1 Electric screwdriver

- Rechargeable battery and charger
- Magnetic 1/4" Hex Shank Holder for changeable tips

4.2.2 Manual screwdriver handle (1)

- Magnetic 1/4" Hex Shank Holder for changeable tips
- Material: Chrome-Vanadium
- driver shaft length: 40-60mm

4.2.3 Manual screwdriver handle (2)

- Magnetic 1/4" Hex Shank Holder for changeable tips
- Material: Chrome-Vanadium
- driver shaft length: 170-250mm

4.2.4 Options and accessories for the screwdrivers

4.2.4.1 Changeable tips for the electric and manual screwdrivers

- Material: Chrome-Vanadium

- Model: ¼" x 25mm
- Measurement units: metric, unless otherwise mentioned
- Carry case

4.2.4.1.1  **Slotted Regular** (0.5x3.0, 0.6x4.5, 0.8x5.5, 1.0x6.0, 1.2x6.5, 1.2x8.0mm)

4.2.4.1.2  **Phillips Cross-Slot** (#000, #00, #0, #1, #2, #3, #4)

4.2.4.1.3  **Frearson Cross-Slot** (#000, #00, #0, #1, #2, #3, #4)

4.2.4.1.4  **Hex Metric** (0.71, 0.89, 1.27, 1.5, 2.0, 2.5, 3.0, 4.0mm)

4.2.4.1.5  **Hex Inch** (.050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32", 1/4", 5/16")

4.2.4.1.6  **Star / Torx** (T3, T4, T5, T6, T7, T8, T9, T10, T15, T20, T25)

4.2.4.1.7  **Security Star / Torx** (3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25)

4.2.4.1.8  **Security Spanner** (#4, #6, #8, #10)

4.3 Soldering/Desoldering rework station

- Operating voltage 220v
- Power minimum 300 W
- includes: soldering tool (50w) and desoldering tool (50w)
- changeable tips and nozzles
- solder digital temperature control (minimum range 200-420°C)
- hot air with temperature control
- SMD rework tool (250w) with temperature control (100-420°C)
- vacuum
- controllable air and vacuum flow 1-10L/minute

4.3.1 Options and accessories

- Please include a complete list of available accessories and options.

4.4 *Magnifying lens*

- Includes:
 - light
 - stand
 - holders

5 Supplies

5.1 *CD and DVD*

All CDs and DVDs must conform to the relevant standards and specifications in all parameters, but especially the rate of unrecoverable errors (E32 for CD and PO for DVD), which must be zero.

5.1.1 CD-R with slim case

- Quantity: 100 pcs

5.1.2 CD-R bulk without case

- Quantity: 100 pcs

5.1.3 CD-RW with jewel case

- Quantity: 50 pcs

5.1.4 DVD+R with slim case

- Quantity: 100 pcs

5.1.5 DVD+R bulk without case

- Quantity: 100 pcs

5.1.6 DVD+RW with jewel case

- Quantity: 50 pcs

5.1.7 DVD+R/DL with slim case

- Quantity: 10 pcs

5.1.8 CD wallet

- Capacity: 100 pcs

6 Personal Computers

General requirements for all computers:

- be certified (or tested) for Linux, drivers included in the standard Linux kernel or provided as source code.
- be certified for Windows XP, works with Windows XP with Service Pack 3, drivers for all components provided.
- Documentation: English minimum or Arabic+English
- Licenses for all included software that require a license
- Model supplied must be from a recognized manufacturer and not assembled from supplied components
- Must work with 220-240V AC mains power, cable supplied with grounded Type H / SI 32 / IS16A-R plug
- All necessary cables and accessories needed to operate the equipment as specified must be included.

6.1 Desktop computer (1)

- Case: Mini Tower or Micro tower or Ultra Small
- CPU: minimum 1.8 GHz dual-core , 2MB L2 cache, x86-64 compatible
- RAM: 2 GB RAM, upgradeable to 4 GB without replacing existing modules
- USB Ports: 4 x USB 2.0
- Hard Disk: minimum 160 GB SATA, one free slot for extra hard disk
- Mouse: USB Optical 2 button + scroll
- Keyboard: USB QWERTY US / Arabic combined
- DVD: DVD +/- RW
- Sound adapter: built-in with following ports: audio out, microphone in
- Graphics adapter: 128MB memory, may be shared, DirectX and OpenGL compliant, maximum display resolution: 1280x1024 or more @ 32bit colour, VGA 15 pin connector
- Network adapter: Built-in RJ45 Gigabit Ethernet with PXE network boot support
- Free PCI Express slots: 1

6.2 Desktop computer (2)

- Case: Mini or Mid Tower
- CPU: minimum 2.0 GHz quad-core, 2MB L2 cache total, x86-64 compatible
- RAM: 4 GB RAM

- USB Ports: 4 x USB 2.0
- Hard Disk: minimum 500 GB SATA, two free slots for extra hard disk
- Mouse: USB Optical 2 button + scroll
- Keyboard: USB QWERTY US / Arabic combined
- DVD: DVD +/- RW
- Sound adapter: built-in with following ports: audio out, microphone in
- Network adapter: Built-in RJ45 Gigabit Ethernet with PXE network boot support
- Graphics adapter: 128MB memory, may be shared, DirectX and OpenGL compliant, maximum display resolution: 1280x1024 or more @ 32bit colour, VGA 15 pin connector
- Free PCI Express 4x slots: 2

6.3 Thin Client

- Form factor: thin client, no moving parts
- Processor: Fanless design, 1.0 GHz minimum, x86 compatible
- RAM: 1 GB
- Flash: 1 GB
- USB Ports: 4 x USB 2.0
- Hard Disk: No
- Mouse: USB Optical 2 button + scroll
- Keyboard: USB QWERTY US / Arabic combined
- Sound adapter: Built-in sound, ports: audio out and mic in
- Network adapter: Built-in RJ45 Gigabit Ethernet with PXE network boot support
- Graphics adapter: 32MB memory (may be shared), maximum display resolution: 1280x1024 or more @ 16bit colour, VGA 15 pin connector
- Smart Card reader: Internal or inside keyboard, ISO7816-1/2/3/4, T=0 and T=1, Linux and Windows drivers included
- Installed software: None or Linux
- Power supply: included
- Compatible with VESA mounting holes of monitors, mounting accessory included.

6.4 Laptop computer

- CPU: minimum 1.8 GHz dual-core , 2MB L2 cache, x86-64 compatible

- Hard disk: minimum 120 GB SATA
- USB Ports: 4 x USB 2.0
- RAM: 2 GB RAM, upgradeable to 4 GB without replacing existing modules
- Optical drive: internal DVD-/R/RW
- Card Reader: internal or external USB2 (SD/SDHC, MMC, CF)
- Sound adapter: Built-in, ports: audio out and mic in
- Network adapter: built-in Gigabit Ethernet (RJ45)
- Wireless network adapter: 802.11b/g WiFi
- Display adapter: Screen resolution: 1280x800 @ 32bit colour, 1 x VGA or DVI port
- Monitor: 15.4" WXGA
- Mouse: built-in touchpad mouse with scroll zone
- Keyboard: QWERTY US / Arabic combined
- Extra Ports: 4 x USB 2.0, 1 x Express Card or PCMCIA slot
- Accessories: carrying case, external power supply (110-220V / 50-60 Hz)

6.5 GPS device

- Hand-held
- Power source: AA/AAA or custom rechargeable battery with charger included
- Functions
 - current location coordinates display
 - track recording
 - point recording
 - altitude display
 - data export: GPX

6.6 Accessories and options

6.6.1 External CD/DVD writer

- Writable media types: CD-R, CD-RW, DVD+/-R, DVD+/-RW, DVD+/-RW DL
- Interface: USB 2.0
- Power: powered from USB

6.6.2 External hard disk

- Capacity: 500GB
- Dimensions: 2.5" disk
- Interface: USB 2.0
- Power: powered from USB

6.6.3 USB memory stick (1)

- Capacity: 32 GB

6.6.4 USB memory stick (2)

- Capacity: 16 GB

6.6.5 USB memory stick (3)

- Capacity: 8 GB

6.6.6 Replacement hard disk (1)

- Model: internal, for desktop
- Type: SATA
- Capacity: 1 TB
- Cables and screws included

6.6.7 Replacement hard disk (2)

- Model: internal, for desktop
- Type: SATA
- Capacity: 2 TB
- Cables and screws included

6.6.8 Replacement hard disk (3)

- Model: internal, for laptop
- Type: SATA
- Capacity: 250 GB

6.6.9 Ram upgrade for desktop

- Capacity: 2 GB

6.6.10 Ram upgrade for laptop

- Capacity: 2 GB

6.6.11 Screen (1)

- Display size: 17"
- Display type: TFT (Active Matrix)
- Interface: VGA RGB 15 pin
- Maximum resolution: 1280 x 1024 pixels
- Contrast: 500:1
- Brightness: 300 cd/m²
- VESA mount compatible

6.6.12 Screen (2)

- Display size: 19"
- Display type: TFT (Active Matrix)
- Interface: DVI-I, supports analog and digital
- Maximum resolution: 1280 x 1024 pixels
- Contrast: 500:1
- Brightness: 300 cd/m²
- VESA mount compatible

6.6.13 Screen (3)

- Display size: 24"
- Display type: TFT (Active Matrix)
- Interface: DVI-I dual link, supports analog and digital
- Maximum resolution: 1920 x 1400 pixels
- Contrast: 1000:1
- Brightness: 400 cd/m²
- VESA mount compatible

6.6.14 Screen (4)

- Display size: 17"
- Display type: TFT (Active Matrix)
- Touch screen: USB, drivers for Windows and Linux included
- Interface: DVI or VGA, supports analog

- Maximum resolution: 1280 x 1024 pixels
- VESA mount compatible

6.6.15 Display adapter (1)

- Interface: PCI-Express, compatible with the desktop computer 1 and 2
- Monitor interface: DVI-I dual link, supports analog and digital
- Monitor connectors: two
- RAM: 128 MB
- Drivers: included for Windows and Linux

6.6.16 Display adapter (2)

- Interface: PCI-Express, compatible with the desktop computer 1 and 2
- Monitor interface: DVI-I dual link, supports analog and digital
- Monitor connectors: two
- RAM: 512 MB
- Drivers: included for Windows and Linux

6.6.17 Keyboard (1)

- Interface: USB
- Keyboard layout: US with Arabic

6.6.18 Keyboard (2)

- Interface: USB
- Keyboard layout: US with Arabic
- Smart Card reader included: ISO7816-1/2/3/4, T=0 and T=1, Linux and Windows (XP and 2003) drivers included on CD.

6.6.19 Smartcard Reader (1)

- Interface: PCMCIA
- Cards supported: ISO7816-1/2/3/4, T=0 and T=1,
- Drivers: Linux and Windows (XP and 2003) included on CD.

6.6.20 Smartcard Reader (2)

- Interface: Expresscard
- Cards supported: ISO7816-1/2/3/4, T=0 and T=1,
- Drivers: Linux and Windows (XP and 2003) included on CD.

6.6.21 Smartcard Reader (3)

- Interface: USB
- Cards supported: ISO7816-1/2/3/4, T=0 and T=1,
- Drivers: Linux and Windows (XP and 2003) included on CD.

6.6.22 Wireless mouse

- Interface: USB
- Guaranteed working distance 1M non line of sight
- Optical LED or laser
- Two buttons and a scroll button

6.6.23 Software options:

6.6.23.1 Windows

- Preinstalled software: Microsoft Windows XP Professional Arabic
- Original Windows installation media (CD or DVD) included
- Media with drivers (CD or DVD) included
- Licenses: all required software licenses must be included
- Media: All installation media to be provided

6.6.23.2 Linux

- Media with drivers included for standard Linux kernel.

7 Printers, faxes, scanners, MFP

General requirements:

- Consumables price list: vendor must supply a general price list for all user replaceable consumables and supplies for a the item offered. On that price list, a discount % must be indicated. This discount % must be valid for minimum 36 months.
- TCO calculation: average cost per printed page, according to the manufacturers official price list of toner cartridge, drum, and other consumables and the average number of printed pages. This number is based on the page coverage measured using ISO/IEC standards and is available from the data sheet of the printer issued by the manufacturer. Bidders shall include itemized calculation in the bid and it will be taken into consideration when evaluating the bid.
- Media: All installation media to be provided including drivers for Linux and Windows

- Documentation: English minimum, English & Arabic preferred
- User interface and keyboard: English minimum, English & Arabic preferred
- Equipment must work with 220v power

7.1 Printers

General requirements for printers:

- Ports: Ethernet (10BaseT/100BaseT), USB2.0
- Protocols: IPv4, IPv6
- Printing language: PCL5, PCL5e, PCL6 or Postscript 3

7.1.1 Printer (1)

- Printing mode: B/W Laser network printer
- Resolution: 600 dpi
- Paper format: A4
- Printing speed: 20 pages/minute minimum
- Trays and capacity: 2 input trays: 1 x manual feed tray, 1 x 500-sheet tray
- Consumables to be supplied with the printer: all replaceable consumables and maintenance materials for 3000 pages: toner cartridges, fusers, drums etc

7.1.2 Printer (2: Label)

- Printing medium: plastic adhesive tape with protective layer
- Printing method: thermal
- Print resolution: 360dpi
- Printing width: 6-27 mm
- Cutter: Automatic full/half
- Computer interface: RJ45 Ethernet 10/100 (separate USB print server permitted)
- Consumables to be supplied with the printer:
 - label cartridges black on yellow 12mm width – 20 PCS
 - label cartridges black on yellow 6 mm width – 20 PCS

7.2 Fax

7.2.1 Fax

- Printing mode: B/W laser
- Automatic sheet feeder: 50 pages
- Send mode: memory transmission
- Fax mode: G3
- Receive memory: 200 pages
- Paper format: A4
- Input tray capacity: 150 sheets
- Telephone handset: Included,
- Consumables to be supplied with the printer: all replaceable consumables and maintenance materials for 1000 pages: toner cartridges, fusers, drums etc

7.3 MFP

General requirements for MFPs.

- Must have the following functions:
 - Printing
 - Laser printing
 - Minimum resolution 600x600 dpi
 - Printing language: PCL6 or Postscript 3 or both
 - Copying
 - Zoom: 50-200%
 - Scanning
 - Colour scanning
 - Flatbed
 - Automatic sheet feeder with minimum 50 pages capacity
 - Scan destinations: SMTP
 - File formats: PDF, JPEG
 - Fax
 - Fax mode: G3, 33.6 kbps
 - Memory send
 - Memory receive
 - Interfaces and connectivity:

- USB 2.0 interface for printing
- Network interface RJ45 10/100 mbit for printing and scanning
- Protocols: IPv4, IPv6
- RJ11 telephone interface for fax

7.3.1 MFP (1)

- Monochrome
- Printing speed: 10 pages/minute
- Input tray and capacity: 150 pages
- Page size: A4
- Fax receive memory: 100 pages
- Consumables to be supplied with the printer: all maintenance material for minimum 5000 pages: toner cartridges, fusers, drums, transfer, waste collector (all that applies but not limited to)

7.3.2 MFP (2)

- Monochrome
- Printing speed: 20 pages/minute
- Input tray and capacity: 500 pages A4 tray, 100 pages manual feed multi-purpose tray
- Copier: first copy out max 12 sec
- Scan to e-mail: SMTP directly without PC
- Scanning: LDAP support for address book
- Scan to network folder: SMB with active directory support, FTP
- Scanner supported file formats: PDF, JPEG, TIFF
- RAM: 256 MB minimum
- Hard disk: included
- Consumables to be supplied with the device: all maintenance material for minimum 15000 pages (for example: toner cartridges (measured using ISO/IEC 19752), fusers, drums, transfer, waste collector etc)

7.3.3 MFP (3)

- Monochrome
- Printing speed: 30 pages/minute A4
- Duplex printing: Standard
- Input tray and capacity: 500 pages A4, 500 pages A3, 100 pages manual

feed multi-purpose tray

- Copier: first copy out max 12 sec
- Scanner: A3 (both flatbed and ADF)
- Scan to e-mail: SMTP directly without PC
- Scanning: LDAP support for address book
- Scan to network folder: SMB with active directory support, FTP
- Scanner supported file formats: PDF, JPEG, TIFF
- Paper formats: A4 and A3 minimum
- RAM: 256 MB minimum
- Hard disk: included
- Consumables to be supplied with the device: all maintenance material for minimum 25000 pages (for example: toner cartridges (measured using ISO/IEC 19752), fusers, drums, transfer, waste collector etc)

7.3.4 MFP (4)

- Colour printer
- Printing speed: A4 BW: 30 pages/minute; A4 Colour: 20 pages/minute
- Duplex printing: Standard
- Input tray and capacity: 500 pages A4, 500 pages A3, 100 pages manual feed multi-purpose tray
- Copier: first copy out max 12 sec
- Scanner: A3 (both flatbed and ADF)
- Scan to e-mail: SMTP directly without PC, LDAP support
- Scan to network folder: SMB with active directory support, FTP
- Supported file formats: PDF, JPEG, TIFF
- Paper formats: A4 and A3 minimum
- RAM: 1GB
- Hard disk: included
- Consumables to be supplied with the device: all maintenance material for minimum 25000 pages (for example: toner cartridges (measured using ISO/IEC 19798), fusers, drums, transfer, waste collector etc)

7.4 Bar code reader

- Wireless handle (Bluetooth or other RF)
- Charger: yes, included with the stand or holder or cradle
- Resolution: 0.076 mm

- Feedback for “Good Read”: Required
- Bar codes able to read: 2/5 family, Code 39 (plus Code 32, Cip 39), EAN/UPC, ISBN/ISSN, EAN 128, Code 128, ISBT 128, Code 93, Code 11, CODABAR, TELEPEN, PLESSEY, Code MSI, Code Delta IBM, Code 16K, Code 49, PDF 417
- Drop resistance: IEC 68-2-32 Test ED; withstands repeated drops from 1.8 m onto a concrete surface
- Environmental protection: IP30
- Computer interface: USB
- HID mode: Keyboard emulation

7.5 Accessories and options

7.5.1 Consumables price list

For the devices in 4.1, 4.2, 4.3

Must include all consumables and consumer replaceable parts, like:

- Toner for all colours the device accepts.
- Drum for all colours
- Fuser
- Other items (toner collectors, ADF kit, etc)

7.5.2 Duplex printing option for MFP (2)

7.5.3 Finisher options for MFP(3) and MFP(4)

- Stapling (minimum 25 sheets)
- Sorting

7.5.4 Printserver (1)

- USB printer port
- USB cable included
- Ethernet RJ45 10/100
- IPv4, IPv6
- Network printer protocol: HP Jetdirect/AppPort/port9100 compatible

7.5.5 Printserver (2)

- Parallel printer port: unidirectional, bidirectional
- Ethernet RJ45 10/100

- IPv4, IPv6
- Network printer protocol: HP Jetdirect/AppPort/port9100 compatible

7.5.6 Printserver (3)

- USB printer port: unidirectional, bidirectional
- USB cable included
- Network interface: Ethernet RJ45 10/100/1000
- IP protocols: IPv4, IPv6
- Network printer protocol: HP Jetdirect/AppPort/port9100 compatible

8 Power solutions

8.1 UPS - Rack mounted

8.1.1 UPS - Rack mounted (1)

- Output
 - Output Power Capacity: 32 kW / 40 kVA
 - Output Voltage: 220V 1PH, 380V 3PH
 - Output Frequency (sync to mains): 50 Hz
 - Waveform Type: Sine wave
 - Output Connections:
 - 1 x Hard Wire 5-wire (3PH + N + G)
- Input
 - Bypass: Built-in Maintenance Bypass
 - Input Voltage: 380V 3PH
 - Input Frequency: 50 Hz
 - Input Connections: Hard Wire 5-wire (3PH + N + G)
- Batteries & Runtime
 - Battery Type: Maintenance-free sealed, leakproof
 - Backup Time at Full Load: 7 minutes (32000 Watts)
- Communications & Management
 - Control panel: status and control console
 - Audible Alarm: Audible and visible alarms : configurable delays
 - SNMP management and monitoring: RJ-45 10/100 Base-T Ethernet
 - Emergency Power Off (EPO): Yes

- Start-Up Service, installation and material included
- Warranty: 1 year repair on-site or replace

8.1.2 UPS - Rack mounted (2)

- Output
 - Output Power Capacity: 16 kW / 20 kVA
 - Output Voltage: 220V 1PH, 380V 3PH
 - Output Frequency (sync to mains): 50 Hz
 - Waveform Type: Sine wave
 - Output Connections:
 - 1 x Hard Wire 5-wire (3PH + N + G)
- Input
 - Bypass: Built-in Maintenance Bypass
 - Input Voltage: 380V 3PH
 - Input Frequency: 50 Hz
 - Input Connections: Hard Wire 5-wire (3PH + N + G)
- Batteries & Runtime
 - Battery Type: Maintenance-free sealed, leakproof
 - Backup Time at Full Load: 5 minutes (16000 Watts)
- Communications & Management
 - Control panel: status and control console
 - Audible Alarm: Audible and visible alarms : configurable delays
 - SNMP management and monitoring: RJ-45 10/100 Base-T Ethernet
 - Emergency Power Off (EPO): Yes
- Start-Up Service, installation and material included
- Warranty: 1 year repair on-site or replace

8.1.3 UPS - Rack mounted (3)

- Output Power: 8000 Watts / 10 kVA
- Output Voltage: 220V
- Efficiency at Full Load: over 90%
- Crest Factor: 3 : 1
- Waveform Type: sine wave
- Output Connections

- 1 x Hard Wire 3-wire (H N + G)
- 4 x IEC 320 C13
- 4 x IEC 320 C19
- Bypass
- Internal Bypass (Automatic and Manual)
- Input Voltage: 220V
- Input Connections
 - 1 x Hard Wire 3 wire (1PH+N+G)
 - 1 x Hard Wire 5-wire (3PH + N + G)
- UPS type: online, double conversion
- Battery Type: Maintenance-free sealed, leakproof
- Typical Backup Time at Full Load: 4.8 minutes (8000 Watts)
- Communications & Management: RJ-45 10/100 Base-T
- Rack Height: 6U maximum
- SNMP management and monitoring: RJ-45 10/100 Base-T Ethernet
- Start-Up Service, installation and material included

8.2 UPS – Stand-alone

8.2.1 UPS - Stand alone (1)

- Form factor: stand alone
- Output power capacity: 750VA
- Output voltage: 220V
- Waveform type: Sine wave
- Input voltage: 220V
- Battery type: Maintenance-free sealed lead-acid battery with suspended electrolyte (leak-proof)

8.2.2 UPS - Stand alone (2)

- Form factor: stand alone
- Output power capacity: 1500VA
- Output voltage: 220V
- Waveform type: Sine wave
- Input voltage: 220V
- Battery type: Maintenance-free sealed lead-acid battery with suspended

electrolyte (leak-proof)

9 Network equipment

General requirements for network equipment:

- All equipment (except PoE) must be able to operate with 220v power. If a different rating is foreseen by manufacturer, but power supply is not included in the default configuration, one must be delivered with the equipment to satisfy this requirement.
- All network equipment (except powered by PoE) must have power cables with IEC 60320 C14 plug which allows it to be connected to an IEC 60320 C13 (standard UPS) socket.
- All equipment must be IPv4 and IPv6 capable.
- All equipment must be 19" rack mountable and include the rack mounting kit, unless the item is not available in this configuration or its purpose is to be installed in other locations.

9.1 Firewalls

9.1.1 Firewall (1)

- Network appliance incorporating address and protocol filtering, VPN, NAT
- Ability to work with central management console, SNMP
- RAM: 256 MB
- Interfaces: 3 x Fast Ethernet, 2 x Gigabit Ethernet
- Failover: Configurable automatic failover routes
- High availability and load balancing included : Active/Standby and Active/Active
- VPN and encryption: IPSec encryption (AES 128/256) with 50 licenses for simultaneous connections
- VPN load balancing included: yes
- Performance: Firewall 400 Mbps, IPSEC AES 400Mbps
- Additional features:
 - IKE support
 - site-to-site VPN
 - QoS services
 - OSPF dynamic routing
 - DHCP server/relay
 - NAT/PAT support

- 802.1X authentication with RADIUS, EAP
- DMZ
- Licenses: If any of the features requires license, it must be included

9.1.2 Firewall (2)

- Network appliance incorporating address and protocol filtering, VPN, NAT
- Ability to work with central management console, SNMP
- RAM: 256 MB
- Interfaces: 4 x Gigabit Ethernet
- Failover: Configurable automatic failover routes
- High availability and load balancing included : Active/Standby and Active/Active
- VPN and encryption: IPSec encryption (AES 128/256) with 50 licenses for simultaneous connections
- VPN load balancing included: yes
- Performance: Firewall 400 Mbps, IPSEC AES 400Mbps
- Additional features:
 - IKE support
 - site-to-site VPN
 - QoS services
 - OSPF dynamic routing
 - DHCP server/relay
 - NAT/PAT support
 - 802.1X authentication with RADIUS, EAP
 - DMZ
- Licenses: If any of the features requires license, it must be included

9.2 Routers

9.2.1 Router

- Interfaces: 4 x Gigabit Ethernet
- Source and destination based policy routing
- QoS services
- OSPF dynamic routing
- IPv4 and IPv6

- NAT/PAT support
- Modular chassis
- Other specifications according to Cisco ASR 1004 or compatible
- Licenses: All required licenses included

9.2.2 Router accessories

- Please include a complete list of hardware and software options

9.3 Switches

9.3.1 Switch (1)

- 48 x 10/100/1000 Ethernet LAN ports with automatic speed detection
- Form factor: 1U
- Noise free, fan-less design.
- MDI/MDIX sensing: Automatic
- Firmware: FLASH upgradeable
- Full/half duplex: auto-negotiation and flow control
- Full-rate non-blocking: all ports
- Bandwidth: 32 Gbit/s
- Manageable: HTTP, SSH, SNMP
- Features:
 - 802.1p QoS
 - 802.1q VLAN
 - 802.1X port authentication support with RADIUS
- Rack mount kit: Included

9.3.2 Switch (2)

- Maximum capacity:
 - 144 auto-sensing 10/100/1000 ports, PoE 802.1af/802.1at on all ports
- Base configuration when delivered:
 - 72 auto-sensing 10/100/1000 ports, PoE 802.1af on all ports
- Expandability:
 - modular design
 - free module slots to facilitate upgrade up to maximum capacity
- Management port: 1 RS-232C DB-9 console port

- Power supply:
 - two redundant power supplies installed
 - allows hot swap
- Switching bandwidth: 200 Gbit/s
- Features:
 - Layer 2 switching
 - IEEE 802.1Q (4,096 VLAN IDs) and 256 VLANs simultaneously
 - Layer 3 routing
 - IEEE 802.1X with a RADIUS server, multiple IEEE 802.1X users per port;
 - Source-port filtering;
 - IGMPv3, LLDP, QoS
- Manageable: HTTP, SSH, SNMP
- Firmware: upgradeable
- Rack mount kit: Included

9.3.3 Switch (3)

- Maximum capacity:
 - 288 auto-sensing 10/100/1000 ports, PoE 802.1af/802.1at on all ports
- Base configuration when delivered:
 - 72 auto-sensing 10/100/1000 ports, PoE 802.1af on all ports
- Expandability:
 - modular design
 - free module slots to facilitate upgrade up to maximum capacity
- Management port: 1 RS-232C DB-9 console port
- Power supply:
 - two redundant power supplies installed
 - allows hot swap
- Switching bandwidth: 400 Gbit/s
- Features:
 - Layer 2 switching
 - IEEE 802.1Q (4,096 VLAN IDs) and 256 VLANs simultaneously
 - Layer 3 routing
 - IEEE 802.1X with a RADIUS server, multiple IEEE 802.1X users per port;

- Source-port filtering;
- IGMPv3, LLDP, QoS
- Manageable: HTTP, SSH, SNMP
- Firmware: upgradeable
- Rack mount kit: Included

9.4 *Wireless access point*

- WiFi standards:
 - IEEE 802.11g and IEEE 802.11b
 - IEEE 802.11i, WPA2, WPA
 - Multiple SSID
- Authentication:
 - IEEE 802.1X, RADIUS and MAC support
- Other:
 - Multiple VLAN support
- Ethernet interface:
 - 10/100 RJ45
- Power:
 - IEEE 802.3af Power over Ethernet
- External antenna
 - Possible to use replacement external antenna
- Management:
 - SNMPv3

9.5 *Options and accessories*

- Please include a complete list of hardware and software options for the offered firewalls, routers and switches, including the following:

9.5.1 Interface modules for the modular switches

9.5.1.1 24-port 10/100/1000 PoE Module

9.5.1.2 24-port 10/100/1000 PoE+ Module

9.5.1.3 20-port 10/100/1000 PoE & 4-port mini GBIC Module

9.5.1.4 24-port Mini-GBIC Module

9.5.1.5 4-port 10 GbE Module for transceivers

9.5.1.6 Gigabit Mini-GBIC

- Distance: short (up to 500m)
- Port: LC 1000Base-SX (IEEE 802.3z Type 1000Base-SX)

9.5.1.7 Gigabit Mini-GBIC

- Distance: medium (up to 10km)
- Port: LC 1000Base-LX (IEEE 802.3z Type 1000Base-LX)

9.5.1.8 Gigabit Mini-GBIC

- Distance: long (up to 70km)
- Port: LC 1000Base-LH

9.5.1.9 10-GbE Optical interface

- Distance: short (up to 300m)
- Port: SC 10-GbE (IEEE 802.3ae Type 10Gbase-SR)

9.5.1.10 10-GbE Optical interface

- Distance: medium (up to 10km)
- Port: SC 10-GbE (IEEE 802.3ae Type 10Gbase-LR)

9.5.1.11 10-GbE Optical interface

- Distance long (up to 30km)
- Port: SC 10-GbE (IEEE 802.3ae Type 10Gbase-ER)

9.5.2 Power supplies for modular switches

9.5.2.1 875W Power Supply

9.5.2.2 1500W Power Supply

9.5.2.3 1500W PoE+ Power Supply

9.5.3 Interface modules for the firewalls

9.5.3.1 8-port 10/100/1000 Module

9.6 Parts compatible with existing equipment

9.6.1 Parts for HP

9.6.1.1 J8698A ProCurve Switch 5412zl

9.6.1.2 J8697A ProCurve Switch 5406zl

9.6.1.3 J8702A ProCurve Switch zl 24-port 10/100/1000 PoE Module

9.6.1.4 J9307A ProCurve Switch zl 24-Port 10/100/1000 PoE+ Module

9.6.1.5 J8705A ProCurve Switch zl 20-port 10/100/1000 PoE + 4-port mini GBIC Module

9.6.1.6 J8706A ProCurve Switch zl 24-port Mini-GBIC Module

9.6.1.7 J8707A ProCurve Switch zl 4-port 10 GbE X2 Module

9.6.1.8 J8712A ProCurve Switch zl 875W Power Supply

9.6.1.9 J8713A ProCurve Switch zl 1500W Power Supply

9.6.1.10 J9306A ProCurve Switch zl 1500W PoE+ Power Supply

9.6.1.11 J8994A ProCurve Switch 5400zl Premium License

9.6.1.12 J4858C ProCurve Gigabit-SX-LC Mini-GBIC

9.6.1.13 J4859C ProCurve Gigabit-LX-LC Mini-GBIC

9.6.1.14 J4860C ProCurve Gigabit-LH-LC Mini-GBIC**9.6.1.15 J8436A ProCurve 10-GbE X2-SC SR Optic****9.6.1.16 J8437A ProCurve 10-GbE X2-SC LR Optic****9.6.1.17 J8438A ProCurve 10-GbE X2-SC ER Optic****9.6.2 Parts for Juniper****9.6.2.1 SSG-140-SB Juniper SSG 140****9.6.2.2 JXU-6GE-SFP-S 6 Port SFP Gigabit Ethernet Universal PIM****9.6.2.3 JXU-8GE-TX-S 8 Port Gigabit Ethernet 10/100/1000 Copper Universal PIM****9.6.2.4 JXU-16GE-TX-S 16 Port Gigabit Ethernet 10/100/1000 Copper Universal PIM****9.7 Environment sensors**

General requirements:

- IPv4 (IPv4 and IPv6 preferred)
- SNMP enabled
- Powered by: IEEE 802.3af Power over Ethernet, splitter permitted
- Network interface: Ethernet RJ45 (10 mbit minimum)

9.7.1 Humidity sensor

- Measurement range: 0% to 100% relative humidity
- Precision: +/- 3%
- Resolution: 1%
- Update frequency: 1 Hz

9.7.2 Temperature sensor

- Measurement range: -20°C to +70°C
- Precision: +/- 1%
- Resolution: 1°C
- Update frequency: 1 Hz

9.8 Patch cable CAT6

- Termination: TIA/EIA-568-B, RJ45
- Certified to: TIA/EIA-568-B.2-1. Cables will be tested to comply upon delivery. Non-compliant products will not be accepted.
- Lengths: (0.5m, 1m, 2m, 3m, 5m, 10m)
- Colours: (grey, red, yellow, blue, green)

10 Test and measurement equipment

10.1 Cable finder

- Used for:
 - Copper cabling media including; 75 or 50 Ohm Coaxial cable; Two Conductor control, security, generic cabling.
 - 10 Base-T or 10/100 Base-T data communications networks. (RJ45)
 - POTS telecom service and UTP and STP cable. (RJ11)
- Tone generation on all 4 pairs of UTP / STP cabling.
- Included: one tone generator and one probe.

10.2 Digital multimeter

- Voltage DC
 - Accuracy* $\pm (0.15\%+2)$
 - Max. Resolution 0.1 mV
 - Maximum 1000 V
- Voltage AC
 - Accuracy* $\pm (1.0\%+3)$
 - Max. Resolution 0.1 mV
 - Maximum 1000 V
- Current DC
 - Accuracy* $\pm (1.0\%+3)$
 - Max. Resolution 0.01 mA
 - Maximum 10 A
- Current AC
 - Accuracy* $\pm (1.5\%+3)$
 - Max. Resolution 0.01 mA
 - Maximum 10 A

- Resistance
 - Accuracy* $\pm (0.9\%+1)$
 - Max. Resolution 0.1 Ω
 - Maximum 50 M Ω
- Capacitance
 - Accuracy* $\pm (1.2\%+2)$
 - Max. Resolution 1 nF
 - Maximum 10,000 μ F
- Frequency
 - Accuracy* $\pm (0.1\%+1)$
 - Max. Resolution 0.01 Hz
 - Maximum 100 kHz
- Temperature
 - Max. Resolution 0.1°C
 - Range -40°C/400°C

10.3 Digital oscilloscope

- Bandwidth 200 MHz
- Real-time sample rate 2.5 GS/s
- Inputs and digitizers 2 plus external / DMM input
- Independently floating isolated inputs
 - Up to 1000 V between inputs, references and ground
- Timebase range 5 ns - 2 min/div
- Scope measurements:
 - Cursor: 7
 - Automatic: 30
- Maximum record length
- ScopeRecord mode: 27,500 pts per input
- Scope mode: 3,000 pts per input
- Memory:
 - Screens + Setups: 15
 - Replay + Setups: 2
- Display: full color LCD with fast update rate
- Battery capacity 4 hr

- Charger included

10.4 Options for existing LAN Cable analyzer model Fluke DTX 1800

10.4.1 Coaxial testing option set & adapters

10.4.2 Fiber testing option set & adapters

10.4.3 Cat 6A/Class E_A Permanent Link Adapters

10.4.4 Cat 6/Class E Channel Adapters

10.4.5 Patch cable adapters

11 Rack cabinets

General requirements for rack cabinets:

- Standard 19" rack suitable for servers and communications
- Square hole
- Four rails
- Width: 19" / Depth: 1000mm
- Ventilation slots / Cable entry slots
- Levelling feet

11.1 Rack cabinet (1)

- Capacity 42U
- Height max 2000mm without legs

11.2 Rack cabinet (2)

- Capacity 10U

11.3 Rack cabinet (3)

- Capacity 44U

11.4 Rack cabinet options

11.4.1 Stabilizer and ballast kit

11.4.2 Cable management kit

11.4.2.1 Cable D-rings

11.4.2.2 Cable ties (velcro or similar)

11.4.3 Earthing / grounding cables kit

11.4.4 Captive nuts and screws

- Package of nuts and screws (200 pcs)

11.4.5 Power distribution units

- 0U capability
- 16A, 230V
- 10 x C13, 2 x C19

11.4.6 Server console switch

- USB
- 4 servers

11.4.7 server console cables

- Cables kit for server console switch
- Keyboard and mouse cables type: USB
- Video cables type: VGA RGB 15 pin

11.4.8 Rackmount screen and keyboard

- Screen size: 17"
- Mouse: touchpad, USB
- Keyboard: US, USB

11.4.9 lockable side panels

11.4.10 air patch panels

- Size: 0.5U
- Panel for cable pass-through for cable management.

11.4.11 Filler panels

11.4.12 Utility shelf

11.4.13 Locking drawer

- Size: 2U

12 Servers

General:

- certified for Linux, must work with standard Linux kernel. Drivers delivered on a separate media.
- certified for Windows 2003 R2, drivers delivered on a separate media.
- Form factor – standard 19” rackmount model, rack mounting kit included
- Cable management kit included for the rear of the server.
- Power supply: two redundant hot-plug, 220v AC. Including power cords allowing connecting to UPS (IEC 60320 C14 plug).
- Documentation: English (optional: additional languages)
- If any of the features requires a license, then the license must be included

12.1 Server (1)

- Height: 1U
- CPU: Two, x86-64 compatible, coolers included; must support virtualization
- Performance: SPECint2006 Rate $\geq$ 65.0, SPECfp2006 Rate $\geq$ 55.0
- RAM: 16GB advanced EEC registered, upgradeable to 32GB without replacing existing modules.
- HDD: minimum 4 x hot plug Serial Attached SCSI (SAS) 2.5” 146GB 10K rpm
- Integrated network adapter: 1 x dual-port electrical Gigabit Ethernet
- Optical drive: internal or external DVD +/- R / RW 16x min

- Integrated SCSI controller: SAS dual channel SCSI controller with 256 MB BBWC, supporting RAID 6 configuration
- Motherboard slots free: 1 x PCI-Express (physical connector minimum 4x)
- Ports: 1 x serial, 2 x USB 2.0
- Remote management: ability to perform system management and remote installation activities remotely: virtual power button, virtual floppy drive, virtual CD drive. Ethernet 10/100 port for management.
- Integrated Graphics: VGA-compatible controller. 1 x VGA 15 pin interface.
- Chassis fans: preferred: redundant. supporting hot-plug
- Installed software: NO

12.1.1 Options and accessories

12.1.1.1 Replacement hard disk

12.1.1.2 Memory modules for upgrade to 32GB

12.2 Server (2)

- CPU: Two, x86-64 compatible, coolers included; must support virtualization
- Performance: SPECint2006 Rate ≥ 65.0 , SPECfp2006 Rate ≥ 55.0
- RAM: 16GB advanced EEC registered, upgradeable to 32GB without replacing existing modules.
- HDD: 8 x hot plug Serial Attached SCSI (SAS) 2.5" 146GB 10K rpm
- Integrated network adapter: 1 x dual-port electrical Gigabit Ethernet
- Optical drive: internal or external DVD +/- R / RW 16x min
- Integrated SCSI controller: SAS dual channel SCSI controller with 256 MB BBWC, supporting RAID 6 configuration
- Motherboard slots free: 1 x PCI-Express (physical connector minimum 4x)
- Ports: 1 x serial, 2 x USB 2.0
- Remote management: ability to perform system management and remote installation activities remotely. Ethernet 10/100 port for management.
- Integrated Graphics: VGA-compatible controller. 1 x VGA 15 pin interface.
- Chassis fans: preferred: redundant. supporting hot-plug
- Installed software: NO

12.2.1 Options and accessories

12.2.1.1 Replacement hard disk

12.2.1.2 Memory modules for upgrade to 32GB

12.3 Server (3)

- CPU: Two, x86-64 compatible, coolers included; must support virtualization
- Performance: SPECint2006 Rate ≥ 65.0 , SPECfp2006 Rate ≥ 55.0
- RAM: 16GB advanced EEC registered, upgradeable to 32GB without replacing existing modules.
- HDD: total 12 TB SATA or SAS
- Integrated network adapter: 1 x dual-port electrical Gigabit Ethernet
- Optical drive: internal or external DVD +/- R / RW 16x min
- Disk controller: dual channel SAS (for SATA disks) controller with 256 MB BBWC, supporting RAID 6 configuration
- Motherboard slots free: 1 x PCI-Express (physical connector minimum 4x)
- Ports: 1 x serial, 2 x USB 2.0
- Remote management: ability to perform system management and remote installation activities remotely. Ethernet 10/100 port for management.
- Integrated Graphics: VGA-compatible controller. 1 x VGA 15 pin interface.
- Chassis fans: preferred: redundant. supporting hot-plug
- Installed software: NO

12.3.1 Options and accessories

12.3.1.1 Replacement hard disk

12.3.1.2 Memory modules for upgrade to 32GB

12.4 Accessories and options

12.4.1 Power cable

- IEC60320 C13 to IEC60320 C14

12.4.2 Network adapter

- PCI-Express
- 4 x electrical Gigabit Ethernet

12.4.3 Keyboard

- Interface: USB
- Layout: QWERTY US / Arabic

12.4.4 Mouse

- Interface: USB
- Optical wheel mouse

12.5 Storage System

12.5.1 Storage system for two sites

- Redundant multi-site SAN with iSCSI; Disk RAID and Network RAID
- Form factor: 19" rack-mount; rack mount accessory kit included
- Storage space included: 10TB per site/node, capacity to expand up to at least 256 hard disks or more.
- Disks configuration: RAID 6, SATA or SAS disks, hot swap, 1GB battery backed cache
- Integrated network adapter: 4 x electrical Gigabit Ethernet
- iSCSI: supports Windows Server 2003/2008, Linux, VMware ESX
- Redundant power supply included, hot swap
- RAM: 8GB, ECC
- Remote management: ability to perform system management activities (e.g. shutdown) remotely. Ethernet 10/100 port for management.
- Network clustering support:
 - Synchronous and asynchronous replication of data and volume snapshots to remote sites
 - Multi-site high availability (Active/Active site fail-over)
 - Disaster recovery tools
 - Network RAID to protect against whole site failures
- On-line modifications to system (add capacity, migrate volume etc)
- All software and licenses included for the specified functionality
- Set-up training: 2 persons, 8 hours

- Set-up service and assistance
- Warranty for the storage: 3 years on site, next business day

12.5.2 Additional site /node for the system

List available options to to add nodes to the exiting system.

12.5.3 Storage expansion options

List available options to expand hard disk capacity of a single node.

12.5.4 Backup for storage

- Form factor: 19" rack-mount; rack mount accessory kit included
- Capacity: 120 tape slots, capacity to increase to 200
- Drives: 4 x LTO-4 drive, capacity to increase to 10
- Encryption of backups included
- Management interface: Ethernet RJ45
- Media: All installation media to be provided
- Documentation: English (optional: additional languages)
- All connectivity and equipment included to enable making backups
- Backup software included
- System language: English

12.5.5 Options and accessories

12.5.5.1 Centralized management console for the storage cluster

12.5.5.2 Replacement / additional hard disk

12.6 Backup

12.6.1 Tape Backup library

- Form factor: 19" rack-mount; rack mount accessory kit included
- Capacity: 24 tape slots
- Drives: 1 x LTO-4 drive
- Host interface: SCSI Ultra320 LVD
- Management interface: Ethernet RJ45
- Media: All installation media to be provided

- Documentation: English (optional: additional languages)
- Software Language: English

12.6.2 Options and accessories

12.6.2.1 LTO-4 tape

- Capacity 1840 GB

12.6.2.2 Cleaning tape

- Compatible with LTO-4 drive

12.6.2.3 Bar code labels for tapes

- From the same original manufacturer of the tapes
- Pre-printed
- Compatible with LTO-4 tape

12.6.2.4 SCSI Host Adapter

- Interface: SCSI Ultra320 LVD
- Multiple LUN support
- PCI-Express 4x

12.7 Parts compatible with existing equipment

12.7.1 HP Servers

12.7.1.1 Redundant power supply for HP DL185G5

12.7.1.2 Redundant power supply for HP DL380G5

12.7.1.3 Replacement hard disk for HP DL185G5

- SATA 3.5" 250GB

12.7.1.4 Replacement hard disk for HP DL380G5

- SAS 2.5" 143GB

13 Photo Cameras

13.1 Digital Camera (1)

- Sensor size: 8.0 Megapixels
- ISO sensitivity range: 80-1600 and Auto
- Shutter speed: 15 - 1/1600 sec
- Autofocus: included
- Flash: manual on/off
- Lens: 28 – 105mm (35mm equivalent)
- View monitor: 3" TFT
- Computer interface: Mini-USB, no extra driver software required for file transfer, cable included
- Memory card compatibility: MMC, SD, SDHC
- Memory card supplied: 2 GB SD, speed 15MB/s minimum
- Battery: Li-Ion
- Battery charger: 220v, included
- Additional features: TV output, RCA cable included
- Other accessories included: Carrying case
- Documentation: English minimum, English & Arabic preferred

13.2 Digital Camera (2)

- Sensor size: 10.0 Megapixels
- ISO sensitivity range: 100-3200 and Auto
- Shutter speed: 30 - 1/8000 sec
- Autofocus: yes
- Flash: manual on/off
- Exchangeable lenses: yes
- View monitor: 3" TFT
- Computer interface: Mini-USB, no extra driver software required for file transfer, cable included
- Memory card compatibility: CompactFlash
- Battery: Li-Ion
- Battery charger: 220v, included
- Additional features: TV output, RCA cable included
- Other accessories included: Carrying case

- Documentation: English minimum, English & Arabic preferred
- Lens: 18 – 200mm (35mm equivalent), optical stabilizer included, high quality glass

13.3 Accessories and Options

13.3.1 Memory card (1)

- Standard: SDHC
- Memory size: 4 GB
- Transmission speed: 15 MB/s minimum

13.3.2 Memory card (2)

- Standard: CompactFlash
- Memory size: 8 GB
- Transmission speed: 20 MB/s minimum

13.3.3 Memory card reader

- Interface: USB2
- Power supply: must work without external power supply
- Card standards: SD/SDHC, MMC, CompactFlash

14 Presentation equipment

14.1 Displays

14.1.1 Projector (1)

- Resolution: 1024x768 pixels uncompressed
- Display technology: LCD
- Video inputs: 1 x VGA 15 pin, 1 x RCA composite video
- Remote control: included
- Aspect ratio: 4:3
- Noise level: 35db maximum
- Brightness: 2000 ANSI lumens
- Lamp lifetime: 2000 hours minimum
- Contrast: 1:500
- Focus: optical, manual

- Zoom: optical, manual
- Trapezoid adjustment: automatic, manual
- Security cable
- Documentation: English minimum, English & Arabic preferred
- Included accessories:
 - Extra lamp

14.1.2 Projector (2)

- Resolution: 1024x768 pixels uncompressed
- Display technology: LCD
- Video inputs: 1 x DVI-I (analog+digital), 1 x RCA composite video
- Remote control: included
- Aspect ratio: 4:3
- Noise level: 35db maximum
- Brightness: 2000 ANSI lumens
- Lamp lifetime: 2000 hours minimum
- Contrast: 1:500
- Focus: optical, manual
- Zoom: optical, manual
- Trapezoid adjustment: automatic, manual
- Security cable
- Documentation: English minimum, English & Arabic preferred
- Included accessories:
 - Extra lamp

14.1.3 Projector accessories

14.1.3.1 Replacement lamp

14.1.4 Screen for projector – tripod model

- Size: 120x120 cm

14.1.5 Screen for projector – wall/ceiling mount - electrical

- Size: 180x180 cm

14.1.6 LCD Screen (1)

- Resolution: up to 1024x768 pixels or more
- Size: 42"
- Display technology: LCD
- Video inputs: 1 x VGA 15 pin, 1 x RCA composite video, 1 x RF TV antenna
- Remote control: included

14.1.7 LCD Screen (2)

- Resolution: 1920 x 1080 pixels minimum
- Size: 42"
- Display technology: LCD
- Video inputs: 1 x VGA 15 pin, 1 x DVI or HDMI
- Remote control: included

14.1.8 LCD Screen (3)

- Resolution: 1920 x 1080 pixels minimum
- Size: 27"
- Display technology: LCD
- Video inputs: 1 x VGA 15 pin, 1 x DVI or HDMI
- Remote control: included

14.1.9 Smartboard

- Interactive whiteboard
- Resolution: 1024x768 pixels minimum
- Size of the touch-sensitive screen area: 150 cm diagonal
- Computer interface: USB
- Display technology: LCD projector
- Video inputs: 1 x VGA 15 pin
- Remote control: included
- Control panel: included

14.2 Accessories

14.2.1 VGA cable

- Length 10m
- Connectors: VGA 15 pin male on both ends

14.2.2 DVI-D cable

- Length 10m
- Connectors: DVI male on both ends

14.2.3 HDMI cable

- Length 10m
- Connectors: HDMI male on both ends

14.2.4 Wireless presenter

- Interface: USB
- Software: works without installing extra drivers in Windows
- Laser pointer: built-in
- Buttons: forward, back, blank screen, start/stop presentation
- Batteries: type AA