No. IV-21011/30/2009-Prov-I
Government of India
Ministry of Home Affairs

26, Man Singh Road, Jaisalmer House,
New Delhi, 16.7.2009

To

The DGs:Assam Rifles/BSF/CISF/CRPF/ITBP/NSG/SSB/BPR&D

Subject:- QRs/Technical Specifications for the Networking System and Video Conferencing System.

The QRs/ Technical Specifications for the Networking System and Video Conferencing System., as per Annexure-I & Annexure-II, respectively, has been accepted by the Competent Authority in MHA.

2. Henceforth, all the CPMFs should procure the above items required by them strictly as per the laid down Technical Specifications/QRs.

16/07/09

(R.S.Sharma)
Director (Prov)

Copy to:-

DD(Procurement),MHA

Copy for information to:-

PS to JS(PM),MHA

Annex - I

QUALITATIVE REQUIREMENTS FOR NETWORKING SYSTEM

1. Networking of an organization is proposed to provide back bone communication and information infrastructure to enable seamless electronic flow across the enterprise. An enterprise network is shown generically at figure -1 and would consist of the following major segments:-

(a) **Wide Area Network**. This connects the multiple, spatially separated locations.

(b) **Access Network**. This extends the connectivity from the WAN connection at the location to the premises of each user, typically in a garrison or campus.

(c) **Local Area Network**. This is used to connect a number of users' host computer and other devices together on an IP network and to connect them to the Access Network.

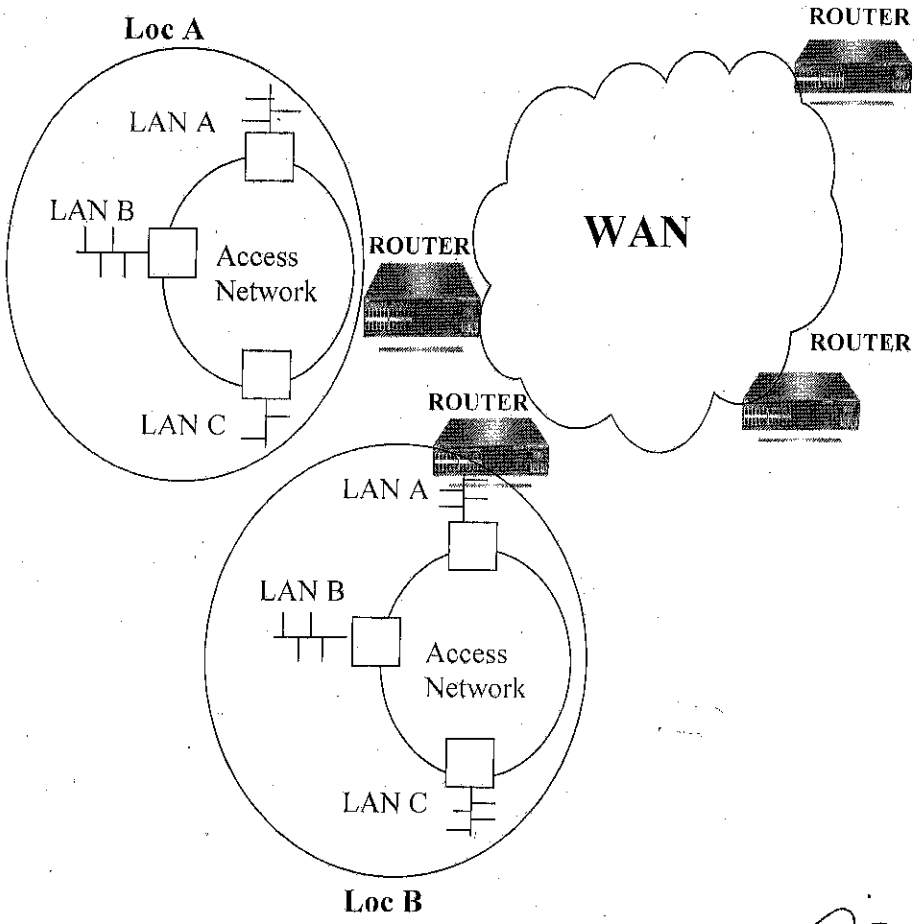

Figure - 1

2. **WAN**. A WAN is engineered using high capacity, and highly redundant media to connect the multiple locations. The following media would typically be used:-

(a) 2 MB (or multiples) of raw data pipes from media provider such as BSNL.

(b) 2 MB (or multiple) connectivity over the public MPLS network established by providers such as BSNL.

(c) Privately owned satellite terminals with dedicated media.

3. The WAN would consist of several routers to provide connectivity between various LANs. The tech spec of WAN router (modular) is attached at Appx 'A'.

4. **Access Network**. An access network extends connectivity to the WAN router by wired or wireless connections depending on location and other factors. The media could be optical fiber cable. The tech spec of optical fiber cable is attached at Appx 'B'.

5. Access Networks typically have a security overlay to protect each location from unwanted intrusion from the WAN. This typically consist of fire wall and Intrusion Detection & Prevention System (IPDS) having VPN encryption capability (IPSec). The tech spec of firewall is attached at Appx 'C', and the tech spec of Intrusion Detection Prevention System (IDPS) is attached as Appx 'D'.

6. Connectivity is extended by the Access Network to the different LANs using a series of switches and components. Typically the following types of switches and components are used:-

(a)	Layer 3 switches	-	Tech spec at Appx 'E'.
(b)	Layer 2 switches	-	Tech spec at Appx 'F'.
(c)	UPS 1 KVA	-	Tech spec at Appx 'G'.
(d)	UPS 2 KVA	-	Tech spec at Appx 'H'.
(e)	Media Converter	-	Tech spec at Appx 'J'.
(f)	Network Management Software (NMS)	-	Tech spec at Appx 'K'.
(g)	Network Management Terminal (NMT)	-	Tech spec at Appx 'L'.
(h)	LIU with coupler 24 ports	-	Tech spec at Appx 'M'.
(j)	Rack 12 U	-	Tech spec at Appx 'N'.
(k)	Fiber Patch Cord (Single Mode)	-	Tech spec at Appx 'O'.
(l)	Fiber Patch Connecter (Single Mode)	-	Tech spec at Appx 'P'.

7. An access Network provides centered stage for users of the network at that location and also across locations depending on the requirements and design of the Network.

8. **LAN** A LAN connects to the access network and extend connectivity to the host computers at various Groups/Units. Typically the following type of switches and components are used:-

(a)	Layer 2 switches	- Tech spec same as Appx 'F'.
(b)	UPS 1 KVA	- Tech spec same as Appx 'G'.
(c)	Media Converter	- Tech spec same as Appx 'J'.
(d)	Firewall	- Tech spec same as Appx 'C'.
(e)	Intrusion prevention Detection System (IDPS)	- Tech spec same as Appx 'D'
(f)	Rack 12 U	- Tech spec same as Appx 'C'.
(g)	Category 6 UTP solid cables	- Tech spec at Appx 'Q'.
(h)	Category 6 UTP patch cords	- Tech spec at Appx 'R'.
(j)	Category 6 UTP Information Outlets	- Tech spec at Appx 'S'
(k)	Category 6 UTP patch panels	- Tech spec at Appx 'T'

4 Appx ' A'
(ref para 3 procurement of networking system
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TECH SPEC OF MODULAR ROUTER

S/No	Nomenclature	Tech Specification
1.	MODULAR ROUTER	(a) **General** - Multi-service access router should support secure intranet & Network access with VPN & firewall protection along with Vlan.
		(b) **CPU** - Should be have least 300Mhz speed
		(c) **Memory** - Flash Memory should be minimum 8Mb and max 32 Mb or more
		(d) **Physical Ports**
		(i) Router should have at least two 10/100M Fast Ethernet ports
		(ii) Router should have one console port
		(e) **Expansion for future use** - Router should have minimum three Expandable Slots
		(f) **Software should support the following:-**
		(i) Frame Relay Protocol
		(ii) PPP Protocol
		(iii) PPPOE(Server/Client) Protocol
		(iv) Router Should support HDLC Protocol
		(v) Router Should support ISDN
		(vi) Router Should support 802.1q Protocol
		(vii) Router Should support MPLS Protocol
		(viii) Router Should support DLSW Protocol
		(ix) Router Should support NAT
		(x) Router Should Support IGMP
		(xi) Router Should Support DHCP (Server/Client/relay)
		(xii) Router Should Support IP Multicast
		(g) **Routing**
		(i) Router should support Static Routing
		(ii) Router Should Support RIP
		(iii) Router Should Support OSPF
		(iv) Router Should Support BGP-4
		(h) **Security**
		(i) Router Should Support Firewall
		(ii) Router Should SupportIPSEC, MPLS VPN
		(i) **Physical & Envorionmental**
		(i) Router Should be operateable from 0' to 40' Deg
		(ii) Router Should be able to work in -20' to 65' C temerature
		(J) **Miscellaneous** :- The product can also be quoted as part of UTM(Unified Threat Management) if simultaneous requirement of Router ,Firewall and IPDS (Intrusion prevention Detection System) arises in a project

Appx ' B'
(ref para 4 procurement of networking system
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TECH SPEC OF OPTICAL FIBRE CABLE

S/ No	Nomenclature	Tech Specification
2.	**SUPPLY & LAYING OF OPTICAL FIBRE CABLE**	(a) **General**- Optical fiber cable will be used to connect layer 2 switches installed at different unit location to layer 3 switch / router at Manesar and for interconnectivity with Palam.
		(b) **Technical Specification** – The product supplied will be UL & IEC approved. The following will be provided:-
		(i) Single mode optical fiber based on armored will be approved with following important parameters:-
		(aa) Numbers of fibers - 06
		(ab) Maximum attenuation - 0.34 db/km
		(ac) Wavelength(ac) = (ac)-1310 nm
		(ad) Wrapping - Loose tube
		(ii) HDPE Pipe (with inner side silcon coating)
		(aa) Nominal dia - 50mm
		(ab) PE - 63
		(ac) Pressure Rating - PN 6.0
		(iii) GI Pipe - 80mm dia GI pipes
		(iv) RCC Pipes -100mm dia rcc pipes
		(v) Brick chambers – Brick bambers 1.6 mtr with RCC covers.
		(vi) Man Hole – Man Hole on every 2 Km.
		(vii) Hand Hole - Hand Hole ov every 200m
		(viii) Fiber Termination frame - Fiber Termination boxes at each location.
		(ix) Fiber distribution frame - Fiber distribution frame at comn centre.
		(x) Distribution of one pair of fibre – Distribution of one pair of fibre to each establishment in Star configuration.
		(c) **Scope of Work** - It will include the following:-
		(i) Preparation of detailed drawing of OFC route plan as per layout diagram attached in consultation with representative of HQ NSG.
		(ii) Submission of approximate bill of quatity for OFC, Pig tails, Fiber termination boxes, Fiber distribution frame, connectors and other items such as GI / RCC/conduit pipes, marking indicatiors etc as per format attached.
		(iii) Laying & Supply of underground armoured TEC approved OFC cable.
		(iv) Cable laying will include excavation of trench up to normal depth of 1.5m in normal soil, 1 m in soft rock and hard rock area, closing of trenches so as to restore it to normal condition. RCC and GI pipes will be required to be out as one or more protection wherever applicable.
		(v) Jointing , testing and commissioning of the complete system with user.
		(vi) Obtaining permission for various agencies for excavation of earth/crossing of road or any other permission in relation with laying of cable.
		(vii) Any other items of works not covered but which may be essential for the execution of the scheme have to be supplied and installed by the vendor. The tenderer has to bring out the necessity of such iteme, with justification in his offer.
		(viii) Road Crossing - Digging with machine and should be under groung without cutting the road.

Ser No	Nomenclature	Tech Specification
2	**SUPPLY & LAYING OF OPTICAL FIBRE CABLE**	(d) **Technical Bid should include following details:-**
		(i) Tech parameters, TEC , Make & type of cable.
		(ii) Technical details of cable.
		(iii) Delivery schedule of the cable and other stores.
		(iv) Time plan for installation.
		(v) Survey report width approximate quantity of cable / stores required.
		(e) **The terms and conditions for laying underground cables will be as under:-**
		(i) The trenching work and laying of cable will be done as per DOT specification
		(ii) The caution boards and information boards will be placed before commencing excavation and will remain fixed till work is completed. The boards will be supplied by the firm.
		(iii) Necessary diagram of power and telecom cable/water pipe lines and sewerage line to lay OFC cable will have to be procured by the firm from Construction Squadron at Manesar and CPWD authority at Samalkha.
		(iv) Work will be inspected by officers of this organization at commencement and at any intermediate stage and on completion.
		(v) Transportation of the cables at the site of the work and back to stre dump will be at the cost of firm.
		(vi) Cable will be laid in the trenches after testing and inspection by the board of officers of this organization . The specification test results will be provided along with handling / taking over certificate.
		(vii) Permission of road cutting from the various departments is to be obtained by the firm.
		(viii) The road cuttings will be covered including tarring of the surface by the contractor after completion on the work.
		(ix) After laying of cables and completion of work by the contractor the same should be entered in the measurement book and signed by the representative of the unit as well by the rep of contractor.
		(x) Arrangement regarding security of cable will be made by the firm both during day and night.
		(xi) The work will be carried out on the route approved by this organization
		(xii) Bricks will be placed on cables for purpose of a warning to people digging.
		(xiii) The route indicators and the joint indicators will be placed at every 200 mtrs and at every joint and change in direction . Hand hole will be made at every 200 metre.
		(xiv) The splicing will be done and protected as p[er DOT standard.
		(f) **Oration and Maintenance** .. The vendor will supply the detailed drawing of laid OFC
		(g) **Items of work** – Excavation of trenches and reinstatement after completion, including excavation of surface and clearance of anyt obstacles enroute such

Sr. No	Nomenclature	Tech Specification
2	**SUPPLY & LAYING OF OPTICAL FIBRE CABLE**	as road, in all types of soil ordinary/hard ,concrete, road crossing, set stoned, bricks, foot paths city/built up / non built up area enroute on this route.
		Laying and jointing of 50m dia HDPE pipes in the excavated trenches before their reinstatement , pulling through 4mm Nylone rope security sealing ends upto 100 mtrs. Securing ends of the pipes by suitable covers.
		Supply , laying and jointing of 80mm dia GI pipes
		Supply , laying and jointing of 100 mm dia RCC pips.
		Constructions of brick chambers 1.6 mtr with RCC covers.
		Supply and fixing of route indicators made of cone at every 200m
		Digging of pits at the pulling points cleaning HDPE pipe, pulling of Nylon rope & OFC cable.
		Jointing of OFC cable excluding , jointing material complete by machine jointing by fusion method.
		Man Hole on every 2 km
		Hand hole on every 200m
		Earthling
		DETAILED EQUIPMENT FOR LAYING OF 6 CORE OFC:-
		(a) Excavation of trenches and reinstatement after completion, including excavation of surface and clearance of any obstacles enroute such as road, in all types of soil ordinary/hard, concrete, road crossing , set stones, bricks foot paths city/built up/non built up area enropute on this route.
		(b) Laying an djointing of 32 mm dia HDPE pipes in the excavated trenches before their reinstatement , pulling through 4mm Nylone rope security sealing ends upto 100 mtrs. Securing ends of the pipes by suitable covers.
		(c) Supply, laying and jointing of 50mm dia GI Pipes will be used for road crossings.
		(d) Supply and fixing of route indicators made on cone at every 200m
		(e) Digging of pits at the pulling point cleaning HDPE pipe, pulling of Nylone rope & OFC cable.
		(f) Jointing of OFC cable excluding , jointing material complete by machine jointing by fusion method.
		(g) Man Hole on every 2 Km

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Appx ' C'
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TECH SPEC OF FIRE WALL

Ser No	Nomenclature	Tech Specification
3	**FIREWALL**	(a) **General -** Firewall is a enforcement point to impose policy, control the network traffic
		(c) **Should have the following System Performance parameters**
		(i) Should support Firewall Performance of 300 Mbps
		(ii) Should support 3DES/AES with Performance of 120 Mbps
		(iii) Should support atleast 4,00,000 concurrent sessions
		(iv) Should support atleast 2500 policies
		(d) **Should support the following Operation Modes**
		(iii) Should support Network Address Translation (NAT)
		(iv) Should support Port Address Translation (PAT)
		(e) **Should provide VPN(Virtual Private Network)**
		(i) Should support IPSec Protocol
		(ii) IPSec Mode - Tunnel mode, Transport mode
		(iii) Encryption Method - DES/3DES/AES/Twofish/ Blowfish/CAST-128/NULL
		(f) **Should Support High Availability**
		(i) Should support Active-Passive HA mode
		(ii) Should support Firewall/VPN session synchronization
		(g) **Miscellaneous** :- The product can also be quoted as part of UTM(Unified Threat Management) if simultaneous requirement of Router ,Firewall and IPDS (Intrusion prevention Detection System) arises in a project

Appx ' D'
(ref para 5 procurement of networking system
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TECH SPEC OF INTRUSION PREVENTON DETECTION SYSTEM (IPDS)

Ser No	Nomenclature	Tech Specification
4	**INTRUSION PREVENTION DETECTION SYSTEM (IPDS)**	(a) **General - Intrusion** Prevention Detection System (IDPS) is used to protect the network from external threats coming from the WAN side.
		(c) **Should have the following System Performance parameters**
		(i) Should support atleast 4,00,000 concurrent sessions
		(ii) Should support atleast 2500 policies
		(d) **Should support the following Operation Modes**
		(iii) Should support Network Address Translation (NAT)
		(iv) Should support Port Address Translation (PAT)
		(e) Should support IPS signature Based Detection
		(f) **Should provide VPN(Virtual Private Network)**
		(i) Should support IPSec Protocol
		(ii) IPSec Mode - Tunnel mode, Transport mode
		(iii) Encryption Method - DES/3DES/AES/Twofish/ Blowfish/CAST-128/NULL
		(g) **Should Support High Availability**
		(i) Should support Active-Passive HA mode
		(h) **Miscellaneous** :- The product can also be quoted as part of UTM(Unified Threat Management) if simultaneous requirement of Router ,Firewall and IPDS (Intrusion prevention Detection System) arises in a project

Appx ' E'
(ref para 6 (a) procurement of networking system
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TECH SPEC OF LAYAR 3 SWITCH

Ser No	Nomenclature	Tech Specification
5	**LAYER 3 SWITCH**	(a) **General**-Multi Layer Routing Switch,enterprises-class intelligent services delivered to the network edge.
		(b) **Intelligence** - Layer 3
		(c) **No of 10/100/1000 Base T Ports** - 24 and SFP loaded with LC ports.
		(d) **Switching Fabric Bandwidth (Backplane)** - At least 108 Gbps
		(e). **Forwarding rate** - >=64 MPPS
		(f) **No of MAC Address** - >=6000
		(g). **VLANs** >=1000
		(h). **Link Aggregation** Should Support Link Aggregation Control Protocol (LACP) which allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad.
		(j) **User Authentication** - should support 802.1x allowing dynamic port based security providing user authentication .
		(k) **Traffic Control** - To be supported
		(l) **Spanning Tree Protocol/Rapid Spanning Tree Protocol** - Should Support IEEE 802.1W rapid spanning tree protocol (RSTP). Backward- compatible with spanning tree protocol (STP) fast start mode spanning tree enable/disable per port
		(m) **Layer 3 Switching** - Should Support IGMP,Multicast,DVMRP,RIP v1/v2,OSPF,VRRP
		(n) **Layer 2 Switching** – Should Support 801.1D,802.1W,802.1s,802.1Q
		(o) **IGMP Snooping** - Should support IGMP snooping on layer2 Interface.
		(p) **Flash Memory** - Minimum 8MB
		(q) **No Of XFP Uplinks Slots** – Minimum 2x10G uplinks slots should be available in series.
		(r) **Basic RIP and static routing** – Should support basic RIP, static routing, and full dynamic(OSPF) IP routing from day one.
		(s) **Stacking Technology** – Should Support virtual stacking, possible to manage up to 9 switches
		(t) **Dynamic Host Configuration Protocol** - Should support Dynamic Host Configuration Protocol.
		(u) **IP Routing** – Should support up to 2,000 external routes, allowing the switch to scale as the network grows- ideal for deployment at the edge of a network using IEEE 802.1w(for advanced routing protocol licence to be obtained from the OEM).
		(v) Stacked units should behave as a single spanning tree mode.

Ser No	Nomenclature	Tech Specification
5	**LAYER 3 SWITCH**	(w) **High–Performance IP Routing** - Should support RIP/OSPF
		(x). **QoS and Control Advanced QoS** - Cross- stack QoS should allow QoS to be configured across the entire stack. Should support 802.1p.
		(y) **Network wide Security Features** – It should support the following :
		(i) Port based Access Control Secure Mode (locks MAC address 802.1x).
		(ii) Implementation of management of the switch using Secure Shell (SSH) and secure Sockets Layer SSL/HTTPS) encryption (56 or 68.bit) preventing unauthorized remote access to the switch over IP networks or from a web browser
		(iii) Priority based on :
		(aa) Diffserv code point (DHCP).
		(bb) IEEE 802.1p Class of service (CoS) VLAN Priority Default port priority.
		(z) **Connectors and Cabin** - It should Provide the following:-
		(i) 10 /100/1000 BASE – T Ports
		(ii) Management console port
		(aa) **Power Supply** - The eqpt works on AC.
		(ac). **Environmental Condition**
		(i) Temperature
		(aa) Operating - 0^0 to 40 deg C
		(ab) Storage - -10 to +70 deg C
		(ad **Dimensions** – Dimensions (H x W x D), H <2.59 in, W < 17.75 in, D < 11.6 in
		(ae) **Safety Features** – The eqpt should comply:-
		(i) EMI
		(ii) FCC class A
		(iii) CUL,CB

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Appx ' F'
(ref para 6 (b) procurement of networking system
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TECH SPEC OF LAYER 2 SWITCH

Ser No	Nomenclature	Tech Specification
6	**LAYER 2 SWITCH**	(a) **Performance**
		(b) **General**- Multilayer switch, Enterprise-class intelligent services delivered to the network edge
		(c) **Intelligence** – layer 2
		(d) **No of 10/100/1000 Base T Ports** - 24 WITH 4 LC Ports
		(e) **Type of Switch** - Fixed
		(f) **High Capacity Switching Fabric Bandwidth (Backplane) supporting wore-speed, non – blocking performance on all ports including Gigabit ports** - Atleast 32Gbps
		(g) **Forwarding rate** - >=35.70 MPPS
		(h) **MAC Address** – Switch should support Min 8000 MAC addresses
		(j) **VLAN** – Min 255 VLANs
		(k) **Link Aggregation**- Should support Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad.
		(l) **User Authentication** - should support 802.1x allowing dynamic port based security providing user authentication .
		(m) **Traffic Control** – Should support Traffic Control
		(n) **Spanning Tree Protocol/Rapid Spanning Tree Protocol** – Should support IEEE 802.1W Rapid spanning tree protocol (RSTP) Backward-compatible with spanning tree protocol (STP) fast-start mode spanning tree enable/disable per port.
		(o) **IGMP Snooping** – Should support IGMP snooping on layer 2 interfaces.
		(p) **Classification of traffic** - Should support IEEE 802.1p based classification of traffic.
		(q) **Prioritization of traffic** – Should support port level prioritization of traffic.
		(r) **Resiliency Features**- Should support Resiliency Features such as Spanning Tree, MSTP,Resilient Links.
		(s) **link Aggregation** - Should support Link Aggregation and port trunk(stackable stacking should be provided).
		(t) **Advanced CoS and Advanced QoS**- Should support 802.1p for Traffic Prioritization
		(u) **Traffic Prioritization** - Should support 802.1p for Traffic Prioritization .
		(v) **Queses & Groups of RMON** - Should support minimum 4 Queses Per Port & minimum 4 RMON.
		(w) **Management** – Should support Web based, CLI / Telnet, SNMP Management.
		(x) **Power Supply**- Should work on AC(100 to 240 VAC)
		(y) **Environmental Condition**- Environmental Condition
		(i) Temperature –
		(aa) Operating - 0° to 40° C
		(ab) Storage - -10 to + 70°C
		(ii) Relative Humidity
		(aa) Operating - 10 to 90% (non condensing)
		(ab) Storage - 5 to 90% (non condensing
		(z) **Safety Features.** – The eqpt should comply:-
		(i) FCC Class A
		(ii) ICES-003 Class A
		(iii) CE , C-Tick,VCCI Class A

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(ref para 6 (c) procurement of networking system
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TECH SPEC OF UPS 1 KVA

Ser No	Nomenclature	Tech Specification
7	**UPS 1 KVA**	(a) Input- 145V-200V 50 Hz + 5%, single phase
		(b) Output- 220V+1% 50 Hz + 1% single phase
		(c) Rating – 1KVA
		(d) Output Waveform - Sinewave
		(e) Input Frequency - 50 Hz +/-3 Hz
		(f) Output Frequency - 47 Hz to 53 Hz
		(g) Surge Protection and filtering
		(h) Backup time- Minimum 10 mins with internal batteries
		(j) Visual Indication- AC mains, AC main higher/ low,UPS on mains, UPS on batteries, fault , and overload .
		(k) Certification- (i) Safety standard certification as per IEC 950/EN50091-1
		(l) Environment Condition- Environment Condition.
		(i) Temperature
		(aa)Operating – 0° to 45°C
		(ab) Storage - -25 to 70°C
		(ii) Relative Humidity
		(aa) Operating – 10 to 85 % (non condensing)
		(ab) Storage - 10 to 85% (non condensing)

Appx ' H'
ref para 6 (d) procurement of networking system
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TECH SPEC OF UPS 2 KVA

Ser No	Nomenclature	Tech Specification
8	**UPS 2 KVA**	(a) Input- 145V-200V 50 Hz + 5%, single phase
		(b) Output- 220V+8% 50 Hz + 1% single phase
		(c) Rating –2KVA
		(d) Output Waveform - Sinewave
		(e) Input Frequency - 50 Hz +/-3 Hz
		(f) Output Frequency - 47 Hz to 53 Hz
		(l) Environment Condition- Environment Condition.
		(i) Temperature
		(aa)Operating – 0° to 45°C
		(ab) Storage - -25 to 70°C
		(ii) Relative Humidity
		(aa) Operating – 10 to 85 % (non condensing)
		(ab) Storage - 10 to 85% (non condensing)

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Appx ' J'
(ref para 6 (e) procurement of networking system
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TECH SPEC OF MEDIA CONVERTER

Ser No	Nomenclature	Tech Specification
9	**MEDIA CONVERTER**	(a) **General** - To Convert 1000Base-Lx fiber to 1000Base-T copper media or vice-versa.
		(b) **Standards to be supported** -IEEE802.3ab 1000Base-Tx,1000Base-Lx
		(c) **Duplex Mode** - Should Support Full Duplex Mode with data rate 1488000pps for 100Mbps
		(d) **LED Indication** - PWR,LNK/ACT
		(e) **Should Support** - 1000Base-Lx single-mode fiber optic cable up to 10KM
		(f) **Environmental Condition**- Environmental Condition
		(i) Temperature –
		(aa) Operating - 0° to 40° C
		(ab) Storage - -10 to + 70°C
		(ii) Relative Humidity
		(aa) Operating - 10 to 90% (non condensing)

Appx ' K'
(ref para 6 (f) procurement of networking system
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TECH SPEC OF NETWORK MANEGEMENT SOFTWARE

Ser No	Nomenclature	Tech Specification
10	**NETWORK MANAGEMENT SOFTWARE**	**General -** To manage the network equipments from a single server.
		(a) Live View of Discovered devices.
		(b)SNMP based trap device .
		(c) Monitor and analyze specific characteristic of any SNMP managable device .
		(d) Inteligent alarm correlation .
		(e) Ability to select port to be monitored .
		(f) Daily management reporting for all the network .
		(g) Max 300 node management .
		(h) Received email notification.
		(j) Multiple users support .
		(k)Topology export: export report into different format.

Appx ' L'
(ref para 6 (g) procurement of networking system
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TECH SPEC OF NETWORK MANEGEMENT TERMINAL		
Ser No	Nomenclature	Tech Specification
11	**NETWORK MANAGEMENT TERMINAL**	(a) **General** - Network Terminal will be used for management of the entire network.
		(b) **Processor** - Core 2 Duo configuration with T8300 chipset with 2.4 GHZ with 3 mb L2 catch 800 MHz FSB or better.
		(c) **Motherboard** - Mobile Intel GM 965 or GM 45 or higher.
		(d) **RAM** - 1GB DDR2 RAM expandable up to 4 GB
		(e) **Hard Disk** - 160 GB 7400 rps min. SATA or higher
		(f) **Display** - 39.1 cm /15.4 ' TFT or 35.5 cm /14.1' active matrix wide screen 1280X 800 WXGA'
		(g) **Wireless/Bluetooth** - Integrated wireless Intel 802.11a/b/g ,Integrated Bluetooth
		(h) **DVD Writer** - Integrated DVD writer with touch pad.
		(j) **Slots** - 2 USB 10/100 Ethernet card ,TGB or Video or VGA PCMCIA /PCI express slot , Microphone ,STEREO Headphone and other standard features
		(k) **Operating System** - Microsoft windows Vista Business and trust Antivirus software latest version with lifetime license , local recovery solution
		(l) **Power Supply** - 230V ,50 HZ AC supply with rechargeable battery pack comprising of Li-ion battery suitable for approx. 4 operating complete with battery charger / adapter.

Appx ' M'
(ref para 6 (h) procurement of networking system
dt 2009

TECH SPEC OF LIU WITH COUPLER

Ser No	Nomenclature	Nomenclature	Tech Specification
12	**LIU WITH COUPLER**	**LIU WITH COUPLER**	(a) **General -** A fiber distribution box wherein the fiber backbone cables & equipment cables are terminated
			(b) **Dimension:** 44 x 410 x 280mm (HxWxD)
			(i) Should be of 19" Rack Mountable Cabinet
			(ii) Should have Complete Aluminum housing, fully powder coated
			(iii) Rubber grommets should be provided at the cable entry points, for tight sealing
			(iv) Should support Flame retardent plastic,high impact resistance
			(v) Should have stacklable design,suffcient room provided for storage of excess cable

Appx ' N'
(ref para 6 (j) procurement of networking system
dt 2009

TECH SPEC OF RACK 12U

Ser No	Nomenclature	Tech Specification
13	**RACK 12U**	(a) **General** - It is needed to install the network equipments.
		(i) 19" rails, adjustable at front and back
		(ii) Front section with tinted glass door with lock and key
		(iii) 19" power strip containing 6 universal sockets

Appx ' O'
(ref para 6 (k) procurement of networking system
dt 2009

TECH SPEC OF FIBER PATCH CORD (SINGLE MODE)

Ser No	Nomenclature	Tech Specification
14	**FIBER PATCH CORD (SINGLE MODE)**	(a) **General** - A fiber patch cord is required to connect the fiber link from LIU to the network switch.
		(b) All optical fiber patch leads shall comprise of Single mode fiber with SC or LC fiber connectors terminated at each end as per requirement. The optical fiber patch leads shall comply with the following specifications
		(c) Should support Epoxy type fiber encapsulation
		(d) Dust caps shall be fitted on each connector at the assembly
		(e) Cable should be of single mode 9/125um

Appx ' P'
(ref para 6 (l) procurement of networking system
dt 2009

TECH SPEC OF FIBER CONNECTER (SINGLE MODE)

Ser No	Nomenclature	Tech Specification
15	**FIBER CONNECTER (SINGLE MODE)**	(a) **General** - A fiber connector is required to terminte the fiber cable in LIU.
		(i) Should be Fully compliance with JIS C5973 F04 Type 2.5mm Zirconia Ferrule, Wide range of Ferrule hole diameter selection.
		(ii) Should support Per-Radiused Ferrule gives fast physical contact PC Polishing.
		(iii) Should support for 3.0mm Cable & 0.9mm Tight buffered fiber.

Appx ' Q'
(ref para 8 (g) procurement of networking system
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TECH SPEC OF CATEGORY 6 UTP SOLID CABLES

Ser No	Nomenclature	Tech Specification
16	**CATEGORY 6 UTP SOLID CABLES**	(a) **General** Cat 6 UTP Solid cables are used to connect I/O box to Patch panel
		(b) Qualifications and Approvals Should be tested and verified for full complaints with the following standards.
		(i) Category 6 according ANSI/TIA/EIA-568-B.2-1 Extrapolates till 350 Mhz.
		(ii) CLASSE according to IEC 61156-5(for ISO/IEC -11801 2nd Edition) .Extrapolates till 350 Mhz.
		(iii) 250 Mhz according to CENELEC EN 50288-5
		(iv) CUL Listed and ETL Verified.
		(c) **Misc**
		(i) Testing every box or reel of cable prior to shipment – providing the highest degree of quality assurance.
		(ii) Exceptional material properties and cable design –providing a unique lifetime Warranty.
		(iii) High ACR values – providing low BER (Bit –Error –Rate) in all applications.
		(iv) Extremely high pair – balance –providing excellent EMC(Electro Magnetic Compatibility) ,minimizing radiation and maximizing noise immunity.
		(v) Revolutionary pair fat scheme – providing an excellent low delay skew.
		(vi) Co- extruded crisp and clear spiral color coding of wires – providing positive wire identification and ease of installation.
		(vii) Descending sequential meter mark – providing easy stock and left- over handling.
		(viii) Smooth and rigid jacket – providing fast and easy cable pulling and insulation.
		(ix) A comprehensive product range – providing all state-of-the-art cable constructions.

Appx ' R'
(ref para 6 (h) procurement of networking system
dt 2009

TECH SPEC OF CATEGORY 6 UTP PATCH CORDS

Ser No	Nomenclature	Tech Specification
17	**CAREGORY 6 UTP PATCH CORDS**	**(a) General -** The cat 6 UTP is used to connect the computer to I/O box
		(b) Qualifications and Approvals
		(i) Jack mating life:750 cycle
		(ii) Jack connect force: 100 grams minimum.
		(iii) Jack pull force:20 lbs(89)N
		(iv) Retention force : 13 kgs minimum
		(c) Benefits and Features.
		(i) Cat 6 Unshielded twisted pair 100m Ω stranded cable.
		(ii) Multi Strand and Highly flexible. Exceeds the performance requirements as specified under EIA/TIA 568 B.2-1 Cat6 specifications.
		(iii) HPDE insulation over the conductors and PVC jacket overall.
		(iv) Individual cable pairs are separated by a PE former.
		(d) Physical and Mechanical properties
		(i) Voltage 30 v
		(ii) Current rating 1.5A (max)
		(iii) Dielectric Strength 1000V AC
		(iv) Insulation Resistance 15mΩ(Max)
		(v) Connection 8P 8C
		(vi) Wiring 24-26 AWG Stranded, Unshielded.

Appx ' S'
(ref para 6 (j) procurement of networking system
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TECH SPEC OF CATEGORY 6 UTP INFORMATION OUTLETS

Ser No	Nomenclature	Tech Specification
18	**CATEGORY 6 UTP INFORMATION OUTLETS**	**(a) General - The** cat 6 UTP information Outlets is used an access points for each computer for accessing data.
		(b) Product Feature & Compliances
		(i) Available in 1/2/4 ports ,straight and angled types.
		(ii) available in economy and premium range.
		(iii) CAS technology built in shutter feature.
		(iv) Exceeds Cat 6 performance.
		(v) available in T569A ,T568B are universal pin/pair assignment.
		(vi) Modular design.
		(vii) Exceptional material properties and design.
		(viii) Compatible with 22-26 AWG Solid or slandered conductors
		(ix) ISO/IEC – 11801
		(x) Performance verified till 600 Mhz
		(xi) Label window for port identification.
		(xii) RoHS Compliant. (xiii) ETL Verified. (xiv) ANSI/TIA/EIA – 568 – B.2
		(c) Mechanical
		(i) Size 86x86x12mm /86x147x12mm
		(ii) Plug retention force. 14 kgt (140N)
		(iii) Plug reliability. 750 cycle minimum
		(iv) Jack Contact Material. Phosphor bronze 50u
		(v) Gold over 100u nickel.
		(vi) Conductor compatibility range 22-26 AWG slid
		(d) **Electrical**
		(i) propagation delay 2.5ns Max @1-100 Mhz
		(ii) current rating 1.5 A Max
		(iii) insulation resistance 500m Ω (min)@ 500 Vdc
		(iv) Voltage rating 72 V dc Max .
		(vi) Contact reticance 20 Ω Max per conduct.

Appx ' T'
(ref para 6 (k) procurement of networking system
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TECH SPEC OFCATEGORY 6 UTP PATCH PANEL

Ser No	Nomenclature	Tech Specification
19	**CATEGORY 6 UTP PATCH PANELS**	(a) **General** - A patch panel is an array of jacks, typically rack mounted, that houses cable connection. One normally shorter patch cable will be plugged into the front side, while the back will hold the connection of a much longer and more permanent cable. The assembly of hardware is arranged so that a number of circuits, usually of the same or similar type appear on jacks for monitoring interconnecting, and testing circuits in a convenient and flexible manner.
		(b) **Categery 6 4 pair cable -305 Mtr. 23 AWG Annealed bare solid copper.**
		(i)it should be tested up to 600 MHz frequency speed
		(ii) Return loss should be =>17.3 db.
		(iii) Attenuation should be =<32.9 db/100m.
		(iv) NEXT should be =>38.3 db.
		(v) PSNEXT should be =>36.3 db.
		(vi) ELFEXT should be =>19.8 db.
		(vii)performance Characteristics TIA/EIA-568-B2-1 .
		(c) **Physicals and Mechnical properties.**
		(i) Mild sheet 16mm thick.
		(ii) Provision for 24 cut outs.
		(iii) 442.6 x 44.5mm thick
		(iv) Provision for 1 to 24 high density keystone jacks.
		(v) Contact wiring: Phosphor bronze 50µ* gold over 100µ* nickle plating.
		(vi) Housing: High impact flame retardant plastics, UL9V-0rated.
		(vii) IDC: Accept 23-26 AWG solid wire.
		(viii) Jack matling force: 750 cycle.
		(ix) Jack contact force : 100 garms minimum.
		(x) Jack pull force: 20 lbs(89)N.
		(xi) Retention force: 13 kg minmum.
		(xii) Current Rating:1.5 Amps.
		(xiii) Contact Resistance:20m Ω max.
		(xiv)DC Resistance: 0.1m Ω max.
		(xv) Insulation Resistance: 0.1mΩ max.
		(xvi) Insulation Resistance: 500mΩ minimum.
		(xvii) Data Transmission rate: upto 10g.

Sl No	Nomenclature	Tech Specification
19	**CATEGORY 6 UTP PATCH PANELS**	(d) **MISC**
		(i) This rack mount type unshielded keystone patch panel comes with a design which has redefined engineering elegance.
		(ii) It is a three piece structure that includes Robots slim designed front panel cable management brackts and cable manager ragged plastic bar.
		(iii) The elegant cable management plate
		(iv) Perforated cable tie holes that helps in routing cables and provides a perfect relief.
		(v) The front plate has icon holder which help identify the media used such as computer, telephone, etc.
		(vi) The high performance, high density keystone connector meet and exceed EIA/TIA 568 B.2-1 Cat-6 Specifications.
		(vii) Keystone jacks snap fit-able on the metal case and can be easily removed when ever required.

(M.S. Rao)
Director, DCPW

(J.K. Singh)
DIG(Comn) CCD, NSG

(K.M Venu Kumar)
Dy. Dir. (Workshop), DCPW

(B.B. Lal)
Dy. Dir. (Tech.), IB Hq

(Major S. Panda)
SC (CH/CT), NSG

Approved/ Not Approved

(A.S. Gill), IPS
D.G, CRPF

Appx - C

QUALITATIVE REQUIREMENTS FOR NETWORKING SYSTEM

UTILITY OF EQUIPMENT

1. Networking of an organisation is proposed to provide back bone communication and information infrastructure to enable seamless electronic flow across the enterprise. It would consist of the following major segments :-

(a) **Wide Area Network** This connects the multiple, spatially separated locations.

(b) **Access Network** This extends the connectivity from the WAN coneection at the location to the premises of each user, typically in a garrison or campus.

(c) **Local Area Network** This is used to connect a number of users host computer and other devices together on an IP network and to connect them to the Access Network.

2. **WAN** A WAN is engineered using high capacity, and highly redundant media to connect the multiple locations. The WAN would consisty of several routers to provide connectivity between various LANs.

3. **Access Network** An access network extends connectivity to the WAN router by wired or wireless connections depending on location and other factors. The media could be optical fiber cable. Access Networks typically have a security overlay to protect each location from unwanted instruction from the WAN. This typically consist of fire wall and Instruction Detection & Prevention System (IPDS) having VPN encryption capability (IP Sec).

4. The eqpt proposed to be procured in the project will help establish an access network at Manesar garrison of NSG.

AVAILABILITY OF VENDORS

5. A large of vendor/System Integrators are available to implement the said networking project. A few of them were contacted while carrying out market survey.

(S Panda)
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Project Offr