

राष्ट्रीय अंटार्कटिक एवं  
समुद्री अनुसंधान केन्द्र  
पृथ्वी विज्ञान मंत्रालय  
(भारत सरकार)  
हेड लैण्ड सडा, वास्को डा गामा  
गोवा- ४०३ ८०४ भारत



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**PROCUREMENT SECTION**

**INDIGENOUS ENQUIRY**

M/s.

Ref. No.:

**PR-1283**

**25.09.2015**

Date:

**19.10.2015**

Due Date:

Dear Sir,

You are requested to send your offer for the following items as per the terms and conditions mentioned below and in Annexure III.

SL. NO.	ITEM DESCRIPTION	QTY
	<b>Active Components: Technical specifications are provided at Annexure-1 for below sl.no. 1&amp;2</b>	
1	L2 Stackable Managed switch which has 24 Ethernet 10/100/1000 Ports with 4 combo 10/100/1000Base-T/SFP ports	01
2	Dual-band 802.11ac Unified Access Point	01
	<b>Passive Components: Technical specifications are provided at Annexure-II for below sl. No: 3-9</b>	
3.	Patch Panel CAT 6 UTP Keystone Type-24 Port-Fully loaded	01
4.	Jack CAT 6 Keystone UTP-White	15
5.	Face Plate-Single (Keystone Jack, square)	15
6.	Metallic Concealing back box for faceplate	15
7.	CAT6 UTP 24AWG PATCH CORD:1M, Plug 30U' Snagless	30
8.	CAT6 UTP 23AWG Solid:305M	02
9.	6U Wall mount Rack Gray	01

**Your offer should contain the following information:**

1. Validity period
2. Quantity / Trade discounts, if any.
3. Delivery.
4. Terms of Price.
5. Mode of Despatch.
6. Taxes/VAT applicable with Full Rate/Percentage ('C' / 'D' form not available).
7. Indicate if Excise Duty included or extra and Rate/Not Applicable.
8. Specify Brand/Make Model of the item.
9. Warranty / Guarantee

**Yours faithfully,**

Sd/-  
Executive (Procurement)  
For and on behalf of Director, NCAOR

### Technical Specifications

SL. NO.	<b>L2 GE Switch with 20 Base-T, 4 Combo SFP/Base-T</b>
<b>1.1</b>	<b>Architecture</b>
(a)	L2 Stackable Managed Switch which has 24 Ethernet 10/100/1000 Ports with 4 combo 10/100/1000Base-T/SFP ports,
(b)	Switch should provide option of Redundant power supply
(c)	Switch should have Min. 128 MB SD RAM & 32 MB Flash Memory
(d)	Switch should have SD Card slot in front for easy file store & restoration like firmware, configuration file, boot image, syslog etc.
<b>1.2</b>	<b>Network Media</b>
(a)	SFP's 1000BaseSX, 1000BaseLX,1000BaseTX,1000Base Lx WDM, 1000BASE-ZX; 100BASE-FX; 1G Copper, 1000Base-T
<b>1.3</b>	<b>Performance</b>
(a)	The Switch should have Non-blocking wire speed switch fabric
(b)	The Switch should have Min.88 Gbps Back plane or more
(c)	The Switch should have Min.65 Mpps or more
(d)	The Switch support 2MB packet buffer memory for Non-blocking architecture
(e)	The Switch should support Min. 16K Mac address or more
(f)	The Switch should support Min. 4K VLANs
(g)	The Switch should have 40 Gigabit Stacking Backplane
(h)	The Switch should be able to do Physical Stack up to 6 units per stack or more
(i)	The Switch should be able to do IP Stacking up to 30 units per IP
(j)	The Switch should support Jumbo Frame (up to 9216 Bytes)
<b>1.4</b>	<b>Layer 2 Features</b>
(a)	The Switch should have IGMP Snooping v1,v2,v3 & MLD Snooping v1,v2
(b)	The Switch should have Spanning tree 802.1d, 802.1w,802.1s
(c)	The Switch should have 802.3ad Link Aggregation Up to 30 groups per device
(d)	The Switch should have Port Mirroring One to one/Many to One & RSPAN
(e)	The Switch should have the intelligence to detect the loop occurring from the unmanaged network segment
(f)	The Switch should have the capability to build the trunk across stack
(g)	The Switch should support IEEE 802.3ah, IEEE 802.1ag, 802.1AX & ITU-TY.1731
(h)	It should support LLDP
<b>1.5</b>	<b>L3 Features</b>
(a)	It should support 16 IP interfaces and 512 static routes for IPv4/v6
(b)	It should support IPv6 Neighbour Discovery
<b>1.6</b>	<b>VLAN</b>
(a)	The LAN switch should have IEEE 802.1Q VLAN encapsulation. UP to 255 VLANs per switch and up to 4000 VLAN IDs.
(b)	It should have Automatic Negotiation of Trunking Protocol, to help minimize the configuration & errors.
(c)	It should have centralized VLAN Management. VLANs created on the Core Switches should be propagated to all the others switches automatically, thus reducing the overhead of creating/modifying/deleting VLANs in all the switches in turn eliminating the configuration errors & troubleshooting.
(d)	It should have support for Detection of Unidirectional links and disable them to avoid problems such as spanning tree loops.
(e)	It should support 802.1v & Q-in-Q Vlan, Guest VLAN
<b>1.6</b>	<b>Quality of Service</b>
(a)	It should support 802.1p Priority Queues (8 Queues)
(b)	Queue Handling mode: WRR & Strict Mode
(c)	Granular Rate Limiting functions on per port & flow based to guarantee bandwidth in increments should be as low as 64 Kilobits per second
(d)	Class of service should be based on Switch ports, DSCP, Vlan ID, TCP/UDP ports, Protocol type, 802.1p queues, IPv4/v6 address, IPv6 flow label & User defined packet

	content
<b>1.7</b>	<b>Access Control List</b>
<b>(a)</b>	The LAN switch should have the capability to support access list based on IPv4/v6 address, Protocol type, IPv6 flow label, Time based ACL, Vlan-ID, MAC-ID, DSCP, IPv6 traffic class, TCP/UDP Port, Switch port & user defined packet content
<b>(b)</b>	The Switch should support up to 256 Access Control Entries minimum
<b>1.8</b>	<b>Network Security</b>
<b>(a)</b>	The LAN switch should support IEEE 802.1x to allow dynamic, port based, Host based security, providing user authentication.
<b>(b)</b>	The LAN switch should support for Admission control features to improve the network's ability to automatically identify, prevent and respond to security threats and also to enable the switches to collaborate with third-party such as Microsoft for security-policy compliance and enforcement before a host is permitted to access the network
<b>(c)</b>	It should support for SSHv2, SNMPv3; SNMP over IPv6 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.
<b>(d)</b>	It should support; Local database; RADIUS authentication; TACACS; TACACS+
<b>(e)</b>	It should support DHCP snooping and to allow administrators to ensure consistent mapping of IP to MAC addresses.
<b>(f)</b>	It should support DHCP relay option 82
<b>(g)</b>	It should support port security to secure the access to an access or trunk port based on MAC address. After a specific timeframe, the aging feature should remove the MAC address from the switch to allow another device to connect to the same port. (up to 14 MAC-ID per port)
<b>(h)</b>	It should have IP-MAC-Port binding up to 500 Entries per device
<b>(i)</b>	It should have Web & MAC Based Access Control
<b>(j)</b>	It should have CPU Filtering to protect the CPU from Broadcast/Multicast/Unicast flooding & protocol control packets attacks.
<b>1.9</b>	<b>Management</b>
<b>(a)</b>	The LAN switch should have CLI support to provide a common user interface and command set with all routers and switches of the same vendor
<b>(b)</b>	It should have RMON software agent to support four RMON groups for enhanced traffic management, monitoring and analysis.
<b>(c)</b>	It should support TFTP to reduce the cost of administering software upgrades by downloading from a centralized location
<b>(d)</b>	It should support Network Timing Protocol (NTP/SNTP) to provide an accurate and consistent timestamp to all intranet switches.
<b>(e)</b>	It should support SNMPv1, v2c, v3 and Telnet interface to deliver comprehensive in-band management, and a CLI-based management console to provide detailed out-of-band management.
<b>(f)</b>	It should provide management functions for network segments (access links and individual circuits), monitors individual links.
<b>(g)</b>	It should support configuration rollback to replace current configuration with any saved configuration file
<b>(h)</b>	Switch should consume less power through auto-detection of link status and cable length
<b>1.1</b>	<b>Physical &amp; Environment</b>
<b>(a)</b>	Should support 802.3ah Ethernet Link OAM
<b>(b)</b>	It should support the operating temperature up to 0-50°C and can be operated in 10%-90% RH
<b>(c)</b>	EMI/EMC -FCC Class A, ICES-003 Class A, VCCI Class A., IEC 61000-4-5 Class 3 or ANSI/TIA-968-A
<b>(d)</b>	UL/CSA 60950-1; IEC60950-1

### Annexure I (Specification for WiFi-Access Point)

Sr. No.	Minimum Required Specifications
<b>1.1</b>	<b>Standards</b>
<b>(a)</b>	Compliant with IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n and IEEE 802.11ac
<b>(b)</b>	Compliant with IEEE 802.3ab, IEEE 802.3u and IEEE 802.3x
<b>(c)</b>	Compliant with IEEE 802.11i for enhanced security
<b>(d)</b>	Compliance with IEEE 802.3at for providing PoE based power, and power adapter for alternate source of power supply to AP
<b>(e)</b>	All the Access points supplied should support IPv6 & IPv4 from day one
<b>(f)</b>	Modulation types support-BPSK, QPSK, 16QAM, 64QAM, OFDM, DQPSK, DBPSK and CCK
<b>(g)</b>	Support for IEEE 802.11e U-APSD Automatic Power Save
<b>(h)</b>	Should support IEEE 802.11h for Spectrum and Transmit Power Management
<b>1.2</b>	<b>Interface and antenna</b>
<b>(a)</b>	Should have minimum 2 x auto-sensing RJ-45 10/100/1000 Mbps Gigabit Ethernet ports
<b>(b)</b>	Should have one console port
<b>(c)</b>	Should have LED Indicators: Power, LAN, WLAN (2.4GHz/5GHz)
<b>(d)</b>	Should support internal array of min 6 omni-directional antennas
<b>(e)</b>	Minimum antenna gain of 5 dBi for 2.4GHz and 6.5 dBi for 5 GHz
<b>(f)</b>	The min transmit power of AP should be atleast 18dBm for 2.4GHz and atleast 15 dBm for 5GHz radio
<b>(g)</b>	MIMO: 3x3 with support for 3 spatial streams
	<b>Features</b>
<b>(a)</b>	Access point should support 1300Mbps Data rate with the 5GHz interface operating using 802.11ac and 2.4GHz interface should support 450Mbps Data Rate using 802.11n.
<b>(b)</b>	It should support to work in Stand-Alone mode and in Managed Mode with Wireless Controller
<b>(c)</b>	Should support atleast 30 configurable SSIDs.
<b>(d)</b>	AP should support atleast 15 BSSIDs for the 2.4GHz Radio and 15 BSSIDs for the 5GHz Radio
<b>(e)</b>	Should support auto RF Management for Power saving
<b>(f)</b>	Should support Beamforming technology for enhanced coverage
<b>(g)</b>	Should have Bandsteering functionality to load balance between 2.4 Ghz & 5 Ghz wireless clients
<b>(h)</b>	Access point should have the capability to manually configure the transmit power level as a percentage of the maximum power
<b>(i)</b>	It should support Wi-Fi- Multimedia (WMM) for QoS
<b>(j)</b>	Support to configure client access based on AP utilization level and functionality to Manually limit the number of simultaneous users
<b>(k)</b>	Support for SpectraLink Voice Priority (SVP) for QoS and increased network performance
<b>(l)</b>	The AP should have functionality to form a self-configuring group with one AP automatically pushing its configuration to other identical APs in the network. Atleast 8 Access points should be configurable to be part of one auto synchronization/configuration group.
<b>(m)</b>	AP should support built in Spectrum Scanning for detection and classification of Rogue AP
<b>(n)</b>	The AP should have functionality to change the channel only if the new

	channel leads to a reduction in the RF interference by a minimum configured percentage
(o)	AP should Display throughput and transmitted & received frame count
(p)	Functionality to Continually verify connection to the client, regardless of network traffic levels.
(q)	AP should provide complete system Logs along with feature of sending Email Alert to Administrator based on the configured Severity levels of logs
(r)	Access point should be configurable for dedicated monitoring of the RF environment only.
(s)	Support to Regulate mandatory admission control for voice traffic
(t)	The Access point should support Static Link Aggregation
(u)	When the AP is operating in managed mode it should have functionality to store security, channel, Transmit power & SSID configuration locally in its Flash memory along with the configuration stored on the controller
	<b>Security</b>
(a)	Support for SSID Broadcast Enable/Disable option to prevent detection of the AP network
(b)	Support for Static WEP 64/128/152-bit data encryption
(c)	Support for Dynamic WEP 64/128/152-bit data encryption
(d)	Weak Initialization Vector (IV) avoidance
(e)	Supports WPA Personal/Enterprise, PSK and TKIP
(f)	Supports WPA2 Personal/Enterprise, PSK, TKIP and AES
(g)	802.1x Radius server based authentication
(h)	Authentication with EAP types: EAP-MD5, EAP-TLS,EAP-TTLS,EAP-FAST, EAP-SIM, PEAP-GTC, PEAP-TLS, PEAP-MS-CHAPv2
(i)	Isolation between two wireless clients associated with an access point
<b>1.5</b>	<b>Access point Management &amp; Maintenance</b>
(a)	Remote configuration and management through Web browser, SNMP or telnet with command line interface (CLI)
(b)	Firmware upgradeable using TFTP/HTTP
(c)	Reset to factory default and reboot option using CLI & Web GUI
(d)	Backup and restore of AP configuration using HTTP/TFTP
(e)	Support for Network Time Protocol (NTP) for clock synchronization
<b>1.6</b>	<b>Certifications</b>
(a)	UL 2043, Wi-Fi, LVD, VCCI, CE, FCC, cUL, IC, C-Tick, NCC and TELEC
(b)	AP should be as per WPC norms for indoor AP. OEM should give a undertaking letter stating that the AP will configured as per WPC guidelines for indoor AP and also submit the WPC certificate showing approval
<b>1.7</b>	<b>Memory &amp; Environmental conditions</b>
(a)	Minimum Flash memory of 64 MB and DRAM of 512 MB
(b)	Operating Temperature 0~40°C
(c)	Operation Humidity 10% to 90% non-condensing
(d)	The Access point must be ceiling and wall mountable in the indoor environment. The OEM must provide the required mounting equipment.

(For passive Components)

Number	DESCRIPTION	
<b>1.1</b>	<b>Specification of UTP Cabling System</b>	
<b>1.1.1</b>	The specification of UTP Cabling system should be meet standards as specified below.	
<b>i</b>	Type	Unshielded twisted pair cabling system. TIA/EIA 568-B.1 addendum Category 6 Cabling system
<b>ii</b>	Networks Supported	10/100 Ethernet, 155 Mbps ATM, 1000 Mbps IEEE 802.3ab Ethernet, and proposed Cat 6 Gigabit Ethernet
<b>iii</b>	TIA/EIA 568-B.1	ETL Verified, UL and 3P certified-All three certificates are mandatory
<b>iv</b>	IEEE 802.3ab	Zero-bit Error, ETL verified
<b>v</b>	Warranty	25-year systems warranty; Warranty to cover Bandwidth of the specified and installed cabling system, and the installation costs
<b>vi</b>	Performance characteristic to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4-connector channel
<b>1.1.2</b>	<b>The specification of UTP Cable should be meet standards as specified below:</b>	
<b>i</b>	Type	Unshielded twisted pair, Category 6, TIA/EIA 568-B.2
<b>ii</b>	Conductors	23 AWG solid bare copper
<b>iii</b>	Insulation	Polyethylene
<b>iv</b>	Separator	Should be a cross Fluted filler. Any other filler type, like bi-directional strip would not be acceptable
<b>v</b>	Jacket	Flame Retardant PVC
<b>vi</b>	Approvals	UL and 3P Listed
<b>vii</b>		ETL verified to TIA/EIA Cat 6
<b>viii</b>	Operating temperature	-20 Deg. C to +60 Deg.C
<b>ix</b>	Frequency tested up to	600 MHz
<b>x</b>	Packing	Box of 305 meters
<b>xi</b>	Delay Skew	25ns/100m MAX
<b>xii</b>	Attenuation	22.8dB/100m at 250MHz (or less attenuation values)
<b>xiii</b>	Impedance	100 Ohms+/-15 ohms
<b>xiv</b>	Performance characteristic to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR
<b>1.1.3</b>	<b>The specification of UTP Jacks should be meet standards as specified below:</b>	
<b>i</b>	Type	Unshielded Twisted Pair, Category 6, conform to ANSI/TIA/EIA-568-B.2 Category 6, CENELEC EN 50173 and ISO/IEC-11801 (2 <sup>nd</sup> Edition) requirements
<b>ii</b>	Modular Jack	750 mating cycles
<b>iii</b>	Wire terminal	200 termination cycles
<b>iv</b>	Accessories	Strain relief and bend-limiting boot for cable
<b>v</b>	Dust cover	Integrated hinged dust cover
<b>vi</b>	Housing	Poly-phenylene oxide, 94V-0 rated
<b>vii</b>	Wiring blocks	Polycarbonate, 94V-0 rated

<b>viii</b>	Jack contacts	Phosphorous bronze, plated with 1.27micrometer thick gold
<b>ix</b>	Approvals	UL listed
<b>x</b>	Performance Characteristics to be provided with bid	Attenuation, NEXT, PS NEXT, FEXT and Return Loss
<b>1.1.4</b>	<b>The specification of UTP Jack Panels LOADED should be meet standards as specified below:</b>	
<b>i</b>	Type	24-port, Keystone type, PCB based, Unshielded Twisted Pair, Category 6, TIA/EIA 568-B.2
<b>ii</b>	Ports	24 Ports loaded keystone
<b>iii</b>	Port arrangement	Individual keystone type
<b>iv</b>	Category	Category 6
<b>v</b>	Circuit Identification Scheme	Icons on each of 24-ports
<b>vi</b>	Port Identification	9mm or 12mm labels on each of 24-ports (to be included in supply)
<b>vii</b>	Height	1 U (1.75 inches)
<b>viii</b>	Modular Jack	750 mating cycles
<b>ix</b>	Wire terminal (110 block)	200 termination cycles
<b>x</b>	Accessories	Strain relief and bend limiting boot for cable
<b>xi</b>	Housing	Polyphenylene oxide, 94V-0 rated
<b>xii</b>	Wiring blocks	Polycarbonate, 94V-0 rated
<b>Xiii</b>	Jack contacts	Phosphorous bronze, plated with 1.27micrometer thick gold
<b>xiv</b>	Panel	Fully powder coated pencil grey
<b>xv</b>	Approvals	UL listed
<b>xvi</b>	Termination Pattern	TIA/EIA 568 A and B;
<b>xvii</b>	Performance Characteristics to be provided along with bid	Attenuation, Next, PS NEXT, FEXT and Return Loss
<b>1.1.5</b>	<b>The specification of faceplates (work area will have face plate with back box and jacks)</b>	
<b>i</b>	Standard	Conforms to CAT6 Work Area Data I/O Outlet (RJ45) adhering to EIA/TIA-568-B2.1, ISO/IEC 11801(2002) and CENELEC EN50173-1 (2002) specifications
<b>ii</b>	Type	1-port or 2-port, WhiteFace plate
<b>Iii</b>	Material	ABS/UL 94 V-0
<b>iv</b>	No. of ports	One
<b>1.1.6</b>	<b>The specification of Workstation/Equipment Cords should be meet standards as specified below:</b>	
<b>i</b>	Type	Unshielded Twisted Pair, Category 6, TIA/EIA 568-B.2
<b>ii</b>	Conductor	24-26 AWG, multi-stranded copper
<b>iii</b>	Length	1 meter
<b>iv</b>	Plug Protection	Matching colored snag-less, elastomer polyolefin boot
<b>v</b>	Warranty	25-year component warranty
<b>vi</b>	Terminals	Phosphor Bronze, 50 micron gold plating over selected area and gold flash over reminder, over 100 micron nickel under plate
<b>vii</b>	Jacket	PVC
<b>viii</b>	Insulation	Flame Retardant Polyethylene

## PURCHASE ENQUIRY – GENERAL TERMS AND CONDITIONS

1. This quotation and any order resulting from this Enquiry shall be governed by Terms and Conditions mentioned in this enquiry.
2. Where counter terms and conditions of business have been offered by this supplier, we shall not be deemed to be governed by these unless our specific written/ acceptance there of has been given.
3. No conditions and terms notice of which has not been given by the Supplier while submitting quotation will be considered by us if put forward in subsequent correspondence.
4. **Quotation:** Quotation should be submitted in a envelope super scribed with Enquiry Number and Due Date and the same must reach our office on or before the Due Date. Quotations should preferably be typed and without any corrections and over writings.
5. **Specifications:** Materials should be offered strictly conforming to our specification. The deviation in specification if any should be clearly indicated by the supplier in his quotation. The supplier should also indicate make/type No. of the materials offered. Vague terms such as Best Indian, Best Indigenous. Imported Make should not be used.
6. The rate quoted against each should be in units stated in the Enquiry. Where quotations are in terms of units other than those specified, relationship between the two sets of units must be furnished.
7. **Samples:** Samples where asked for shall be submitted, free of all charges and should reach us before the Due Date of the Enquiry. Sample must be carefully packed and labeled clearly with enquiry No. & due date. We shall not be responsible in any way for the loss or damage of samples due to any reasons whatsoever. In the event of the non-acceptance of offer, supplier will have to remove the samples at his own expenses.
8. **Terms of prices:** Quotation should be submitted on F.O.R. Vasco or F.O.R. Destination price including transit Insurance. Preference will be given to such quotations. For quotations Ex-Works, Ex-godown/F.O.R. Dispatching Station, the approximate packing, forwarding & freight should be indicated by the supplier. Quotations from Local Suppliers should be delivered at our stores.
9. **Validity:** The quotation should remain valid for a minimum period of 90 days from the Due Date of the Enquiry.
10. **Sales Tax: NCAOR is not entitled to issued Form C or D.** No Sales Tax or any other tax shall be payable by us unless payment of the same is specifically mentioned by the suppliers in their quotation and same is legally leviable.
11. **NCAOR is exempted from payment of Excise duty / Custom duty as per Government notification hence the rate should be split into Basic Cost and Excise Duty, if any.**
12. **Duties / Taxes:** Approximate percentage to be charged should be clearly mentioned in the quotation.
13. **Insurance:** The supplier will be responsible for and should cover the insurance for all transit risks if the terms of prices are F.O.R. Vasco or F.O.R. Destination unless otherwise stated specifically by the supplier in his quotation.
14. **Delivery:** Preference will be given to Ex-Stock offers Suppliers submitting quotation on forward delivery basis must indicate earliest firm delivery date by which the materials will be dispatched by them from the date of receipt of order. Offer such as "Ex-stock Subject to prior Sale" or "Delivery at the earliest" may not be entertained.
15. **Inspection:** Material on its arrival at our site will be inspected by our Inspection Department and their decision in the matter will be considered final and binding on the Supplier.
16. **Payment:** Payment for accepted quantity will be made as agreed to while placing order. Discount, Rebate, if any, for early Payment should be clearly stated.
17. Director NCAOR reserves the right to reject any or all the offers received or to accept any offer wholly or in a part of order of a lesser quantity without assigning any reason. The tenders shall be bounded to execute such an order.
18. In case the supplier does not deliver the goods according to the delivery schedule, he will be liable to pay 0.5% of the value of the goods not delivered according to schedule, as liquidated damages for delay of week or party thereof subject to maximum 5% of the value of goods not delivered, without prejudice to the right of NCAOR
19. In case an order placed by the NCAOR based on the quotation submitted by the supplier is not executed by him, the NCAOR may buy the ordered goods from elsewhere and recover, the additional amount if may have to spend in procuring the stores plus 10% to cover the incidental expenses.
20. All disputes arising in connection with executing the purchase order will be subject to the Jurisdiction of the Courts in Goa only.

Sd/-

**Executive Procurement**

For and on behalf of Director, NCAOR