

Addendum - 2

Tender No : KMRC/S&T/IT/NETWORK/12-13(R)
Date of Addendum : 19th SEPTEMBER 2012

The specification of switches would be same as that in our tender No. KMRC/S&T/IT/NETWORK/12-13 along with its addendums. Extracts of the portions with the specification is attached for new vendors.

| Sl. No. | Distribution Switch Layer 3 Switch specification 24 port | Compliance (Yes/No.) | Documentary Evidence |
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| 1 | L3 Fully Managed Switch having 24x10/100/1000BaseT ports with 4xcombo SFP Slots loaded with 1x1000BaseSx transceiver module, 2xopen slots for 10G modules | | |
| 2 | All the transceiver modules & switch should be of same make | | |
| 3 | Switching Capacity should be at least 88 Gbps | | |
| 4 | Packet Forwarding Rate should be at least 65.48 Mbps for 64-byte packet size | | |
| 5 | The switch should have non-blocking architecture & wire-speed performance under fully loaded condition from day-1 | | |
| 6 | The switch should have redundant power supply from day-1 | | |
| 7 | The switch should have at least 32MB flash memory & 256MB of SDRAM | | |
| 8 | The switch should have following flow control features: IEEE 802.3x for full duplex, back pressure for half duplex, Head of Line Blocking Prevention. | | |
| 9 | The switch should have support for 10G based Physical Stacking upto 8 units per stack. Both linear & ring stacking topology must be supported. Must allow link aggregation & mirroring across multiple switches in a stack. | | |
| 10 | The Switch should have following L2 features from Day-1 | | |
| 11 | 1. MAC Address Table size: At least 16000. Should have at least 1000 static MAC | | |
| 12 | 2. Jumbo Frame Support: Minimum size 9200Bytes | | |
| 13 | 3. IGMPv1 v2 v3, at least 1K IGMP snooping groups, IGMP proxy , IGMP group limitation per interface, Querier election, membership report/leaving, version compatibility, static group, debugging. | | |
| 14 | 4. IEEE802.1D STP, 802.1w RSTP, 802.1s MSTP,at least 64 MST instances, Port fast, BPDU guard, BPDU filter, , automatic identification of edge ports, errdisable recovery, root guard or equivalent feature, loop guard or equivalent feature. | | |

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| 15 | 5. Static ARP with at least 8000 ARP entries, Tx Rx & both port mirroring, RSPAN, Flow based mirroring | | |
| 16 | 6. IEEE 802.3ad Link Aggregation: at least 12 groups per switch & at least 8 gigabit ports per group support | | |
| 17 | 7. Port mirroring for Tx/Rx/Both. One-to-One mode, Many-to-one mode, per flow mode | | |
| 18 | 8. IEEE 802.1Q VLAN, 802.1v, at least 4000 VLANs, GVRP, double VLAN (Q-in-Q), Port based VLAN, private VLAN, RFC 3069 (Super VLAN) | | |
| 19 | 9. Protection of Ethernet Ring with I2 traffic recovery time almost 50ms & L3 traffic recovery time almost 200ms. | | |
| 20 | OEM Should be ISO 9001 and ISO14001 certified for design, development and marketing for LAN and WAN products. Brand (not company) presence in India should be for last ten years. | | |
| 21 | All the networking active component should be from same OEM. | | |
| 22 | The Switch should have following L3 features from Day-1 | | |
| 23 | 1. At least 1024 IP interfaces. | | |
| 24 | 2. Multiple IP interfaces per VLAN: at least 256 numbers | | |
| 25 | 3. VRRP RFC2338 , similar or equivalent | | |
| 26 | 4. IPv6 Tunneling supporting static & ISATAP type | | |
| 27 | 5. ARP proxy | | |
| 28 | 6. Gratuitous ARP & Loopback Interfaces of at least 64 interface | | |
| 29 | 7. At least 12K routing entries. | | |
| 30 | 8. At least 1000 Static route, default route, secondary IP, route -map | | |
| 31 | 9. Equal cost or weighted cost multipath route | | |
| 32 | 10. Default Route, Policy based route, RIPv1v2, 2048 RIP routes, (RFC 1058, RFC 1724, RFC 2453, RFC 2082), RIPv6, OSPFv2 RFC2328, RFC 1370, RFC 1365, RFC 2370, RFC 3509 & RFC3101, Support at least 8000 OSPF routes, OSPFv3, BGP, ICMPv6, Neighbor Discover | | |
| 33 | 11. Multicast table size: at least 2K, IGMP v1v2v3, PIM-DM, PIM-SM, PIM-SSM, PIM -snooping, PIMv6, PIM-DMv6, PIM-SMv6, PIM-SSMv6 | | |

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| 34 | The switch should have 802.1p support with 8 queues per port. Strict & WRR queue handling technique | | |
| 35 | The switch should have feature to classify the packets based on 802.1p priority, VLAN, MAC address, IP address, IP prefix, TCP/UDP port number, DSCP/IP preference, IP protocol type | | |
| 36 | The switch should have Port-based & flow-based bandwidth control with minimum granularity of at least 64kbps. Support for both ingress & egress bandwidth control. Per port per queue egress bandwidth control, Time based QoS. | | |
| 37 | The switch should have standard & extended Access control list with at least 1500 ACL rules, ACL based on 802.1p priority, VLAN, MAC address, IP address or IP prefix, TCP/UDP port number, DSCP/IP precedence. Time Based ACL | | |
| 38 | The switch should have feature to protect CPU form the malicious attack hiding in L2/3/4 control protocol. | | |
| 39 | The switch should have the following security features from Day-1: SSH, Broadcast/Multicast/Unicast Storm control, port security, binding of IP address with MAC address & interface. | | |
| 40 | The switch should support 802.1x access control, Guest VLAN & Dynamic ACL assignment. RADIUS & TACACS+ | | |
| 41 | The Switch should have following Management features from day-1: CLI, console port, RMONv1, Telnet Server, TFTP , SNMPv1v2cv3, Syslog, DHCP Server, DHCP Relay option 82, Multiple Image, Multiple configuration, Sntp, Traceroute, Debug | | |
| 42 | The switch should have compliance for the following certifications: FCC Class A, CE Class A, VCCI class A, cUL, CB, | | |
| 43 | The switch should be Rack mountable with 1U height | | |
| 44 | OEM Should be ISO 9001 and ISO14001 certified for design, development and marketing for LAN and WAN products. | | |

| | Access Switch layer 2 switch specification (24 port) | Compliance (Yes/No.) | Documentary Evidence |
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| 1 | L2 stackable fully managed switch with 24x10/100/1000BaseT ports with 4xcombo SFP slots loaded with 1x1000BaseSx module. | | |
| 2 | All the transceiver modules & switch should be of same make | | |
| 3 | The switch should be 19" Rack Mount size with 1U height. | | |
| 4 | The switch should have console port | | |
| 5 | The switch should have switching capacity at least 88Gbps & packet forwarding rate at least 65Mpps for 64-bytes packet size | | |
| 6 | The switch should have non-blocking architecture & wire-speed performance under fully loaded condition. | | |
| 7 | The switch should have physical stacking capability of at least 6 switches per stack & stacking bandwidth at least 20Gbps. | | |
| 8 | The Switch should have the following Layer-2 features from day-1: | | |
| 9 | The switch should have at least 8K MAC address table size. At least 256 static MAC & at least 128 static multicast MAC. | | |
| 10 | The switch should support following flow-control features: 802.3x for full duplex, back -pressure for half duplex . | | |
| 11 | The switch should have Jumbo frame support for at least 12KB frame size. | | |
| 12 | The switch should support 802.1D, 802.1w & 802.1s with at least 16 MSTP or equivalent instances, per port & per device BPDU filtering, Root Guard or equivalent features. | | |
| 13 | The switch should be able to avoid the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN | | |
| 14 | The switch should support 802.3ad Link aggregation with at least 32 groups per device & at least 8 ports per groups. LACP, cross-stack trunk | | |

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| 14 | The switch should support port mirroring with at least 4 mirroring groups. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow based mirroring. | | |
| 15 | The switch should support IGMP v1 v2 & v3 snooping with at least 512 snooping groups. Should support IGMP snooping per VLAN, host based IGMP snooping fast leave, load balancing the multicast traffic when working with LACP or trunk, Static IGMP group. | | |
| 16 | the switch should support MLD v1 & v2 snooping with at least 512 snooping groups. Per VLAN MLD snooping. | | |
| 17 | The switch should support at least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, at least 16 protocol based VLAN per physical port, support multiple VLANs for each protocol, support VLAN classification based on ether type. | | |
| 18 | The switch should support GVRP, Voice VLAN, Port-based VLAN, MAC-based VLAN, Asymmetric VLAN | | |
| 19 | The switch should support gratuitous ARP. | | |
| 20 | The Switch should have the following QoS features from day-1: | | |
| 21 | The switch should support 802.1p, DSCP, at least 8 queues per port. | | |
| 22 | The switch should have following queue handling methods: strict, weighted round robin, strict+ weighted round robin. | | |
| 23 | The switch should CoS & be able to classify packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ethertype, DSCP, protocol type, IPv4 address, TCP/UDP port number, User defined packet content, IPv6 address. | | |
| 24 | The switch should support port based ingress & egress bandwidth control with minimum granularity 64Kbps. Flow-based ingress & egress bandwidth control with minimum granularity of 64kbps. | | |
| 25 | The switch should support time based QoS. | | |
| 26 | The Switch should have the following Security features from day-1: | | |
| 27 | The switch should support access control list based on VLAN ID, MAC address, Ether type, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class. | | |

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| 28 | The switch should support time based ACL. | | |
| 29 | The switch should support SSHv2 for both IPv4 & IPv6, SSLv1v2v3 for both IPv4 & IPv6, Port security with atleast 64 MACs per port. | | |
| 30 | The switch should support broadcast, multicast & unicast strom control. | | |
| 31 | The switch should have feature to protect the CPU from protocol control packet attack. | | |
| 32 | The switch should support DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack protection. | | |
| 33 | The switch should support 802.1x -- RFC 3580, web based access control with customizable web page, MAC based access control, guest VLAN, RADIUS accounting. | | |
| 34 | The switch should support following authentication methods: Local data base, RADIUS, TACACS, TACACS+. | | |
| 35 | The switch should have at least 4 level user account for management access. | | |
| 36 | The Switch should have the following Management features from day-1: | | |
| 37 | The switch support web based -GUI, CLI, telnet server & client, TFTP client, Zmodem, SNMPv1v2cv3, Syslog. | | |
| 38 | The switch should have SNMP trap supporting following events: new MAC notification, Power and Fan errors/recovery, Cold/warm start-up, gratuitous ARP, Link state change, STP state change, SNMP authentication failure, Management access violation, port security violation, DHCP server screening. | | |
| 39 | The switch should be able to enable trusted host by following applications: Telnet, SNMP, HTTP, HTTPS, SSH, Ping. | | |
| 40 | The switch should be able to support SMTP as per RFC2821 | | |
| 41 | The switch should support RMONv1 & v2, 802.1AB LLDP, BootP & DHCP client, DHCP relay option 82, DHCP relay option 12 | | |
| 42 | The switch should support multiple images & configurations, port descriptions, editable system prompt, CPU monitoring feature, memory monitoring feature, SNTP, debug, encrypted password | | |
| 43 | The switch should have inbuilt power saving technique on all Gigabit RJ-45 ports | | |

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| 44 | The switch should have cable diagnostic function to check the status of connected RJ-45 cables. | | |
| 45 | The switch should have operating temperature at least 0-40 degree Celsius | | |
| 46 | The switch should be RoHS compliant & should have following certifications: CE class A, FCC class A, IC class A, C-tick, VCCI. | | |
| 47 | OEM Should be ISO 9001 and ISO14001 certified for design, development and marketing for LAN and WAN products. | | |

| | Access Switch layer 2 switch specification (48 port) | Compliance (Yes/No.) | Documentary Evidence |
|----|---|---------------------------------|---------------------------------|
| 1 | L2 stackable fully managed switch 48 10/100/1000BaseT Ports with 4 combo 10/100/1000BASE-T/SFP ports. | | |
| 2 | The switch should be 19" Rack Mount size with 1U height. | | |
| 3 | The switch should have console port | | |
| 4 | The switch should have power consumption less than 70 Watt. | | |
| 5 | The switch should have switching capacity at least 136Gbps & packet forwarding rate at least 101Mpps for 64-bytes packet size | | |
| 6 | The switch should have non-blocking architecture & wire-speed performance under fully loaded condition. | | |
| 7 | The switch should have physical stacking capability of at least 6 switches per stack & stacking bandwidth at least 20 Gbps. | | |
| 8 | The Switch should have the following Layer-2 features from day-1: | | |
| 9 | The switch should have atleast 16K MAC address table size. At least 256 static MAC & at least 128 static multicast MAC. | | |
| 10 | The switch should support following flow-control features: 802.3x for full duplex, back -pressure for half duplex & Head-of-line blocking prevention. | | |
| 11 | The switch should have Jumbo frame support for at least 12KB frame size. | | |
| 12 | The switch should support 802.1D, 802.1w & 802.1s with at least 16 MSTP or equivalent instances, per port & per device BPDU filtering, Root Guard or equivalent features. | | |
| 13 | The switch should be able to avoid the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN | | |
| 14 | The switch should support 802.3ad Link aggregation with at least 16 groups per device & at least 8 ports per groups. LACP, cross-stack trunk | | |

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| 15 | The switch should support port mirroring with at least 4 mirroring groups. Should support Tx, Rx & both based mirroring. Should support one-to-one & many-to-one mirroring, flow based mirroring. | | |
| 16 | The switch should support IGMP v1 v2 & v3 snooping with at least 512 snooping groups. Should support IGMP snooping per VLAN, host based IGMP snooping fast leave, load balancing the multicast traffic when working with LACP or trunk, Static IGMP group. | | |
| 17 | the switch should support MLD v1 & v2 snooping with at least 512 snooping groups. Per VLAN MLD snooping. | | |
| 18 | The switch should support at least 4K VLAN groups, 802.1Q, 802.1v protocol based VLAN, at least 16 protocol based VLAN per physical port, support multiple VLANs for each protocol, support VLAN classification based on ether type. | | |
| 19 | The switch should support GVRP, Voice VLAN, Port-based VLAN, MAC-based VLAN, Asymmetric VLAN | | |
| 20 | The Switch should have the following QoS features from day-1: | | |
| 21 | The switch should support 802.1p, DSCP, atleast 8 queues per port. | | |
| 22 | The switch should have following queue handling methods: strict, weighted round robin, strict+ weighted round robin. | | |
| 23 | The switch should CoS & be able to classify packets based on following parameters: VLAN ID, 802.1p priority, MAC address, Ethertype, DSCP, protocol type, IPv4 address, TCP/UDP port number, User defined packet content, IPv6 address. | | |
| 24 | The switch should support port based ingress & egress bandwidth control with minimum granularity 64Kbps. Flow-based ingress & egress bandwidth control with minimum granularity of 64kbps. | | |
| 25 | The switch should support time based QoS. | | |
| 26 | The Switch should have the following Security features from day-1: | | |
| 27 | The switch should support access control list based on VLAN ID, MAC address, Ether type, 802.1p priority, DSCP, protocol type, TCP/UDP port, IPv4 address, IPv6 address, IPv6 traffic class. | | |
| 28 | The switch should support time based ACL. | | |

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| 29 | The switch should support SSHv2 for both IPv4 & IPv6, SSLv1v2v3 for both IPv4 & IPv6, Port security with atleast 64 MACs per port. | | |
| 30 | The switch should support broadcast, multicast & unicast strom control. | | |
| 31 | The switch should have feature to protect the CPU from protocol control packet attack. | | |
| 32 | The switch should support DHCP server screening, DHCP client filtering, ARP spoofing prevention, BPDU attack protection. | | |
| 33 | The switch should support 802.1x -- RFC 3580, web based access control with customizable web page, MAC based access control, guest VLAN, Microsoft NAP, RADIUS accounting. | | |
| 34 | The switch should support following authentication methods: Local data base, RADIUS, TACACS, TACACS+ | | |
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| 36 | The Switch should have the following Management features from day-1: | | |
| 37 | The switch support web based -GUI, CLI, telnet server & client, TFTP client, Zmodem, SNMPv1v2cv3, Syslog. | | |
| 38 | The switch should have SNMP trap supporting following events: new MAC notification, Power and Fan errors/recovery, Cold/warm start-up, gratuitous ARP, Link state change, STP state change, SNMP authentication failure, Management access violation, port security violation, DHCP server screening. | | |
| 39 | The switch should be able to enable trusted host by following applications: Telnet, SNMP, HTTP, HTTPS, SSH, Ping. | | |
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| 41 | The switch should support RMONv1 & v2, 802.1AB LLDP, BootP & DHCP client, DHCP relay option 82, DHCP relay option 12 | | |
| 42 | The switch should support multiple images & configurations, port descriptions, editable system prompt, CPU monitoring feature, memory monitoring feature, SNTP, debug, encrypted password | | |
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| 47 | OEM Should be ISO 9001 and ISO14001 certified for design, development and marketing for LAN and WAN products. | | |
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