



## Nagpur Metro Rail Corporation Limited

Date: 28.12.2016

**Name of Work:** Supply, Design and Commissioning of IT Network, IT Infrastructure and Provision of Facility Management Services

**Tender No. :** N1IT-03/2016

**Tender No. (As uploaded in E-Tender Portal of NMRCL):** No. 73

### Corrigendum II

**Part A** – Reply to Pre Bid Queries

**Part B** – Addendum/Corrigendum

**Part C** – Annexure I to Addendum/Corrigendum

**GM/Procurement**

**Nagpur Metro Rail Corp. Ltd.**

<b>PRE BID MINUTES for SUPPLY, DESIGN &amp; COMMISSIONING OF IT NETWORK, IT INFRASTRUCTURE AND PROVISION OF FACILITY MANAGEMENT SERVICES</b>					
<b>Applicant Name</b>	<b>SN</b>	<b>Clause No</b>	<b>Brief Clause Description</b>	<b>Applicant's Query / Suggestion</b>	<b>Response of NMRCL</b>
<b>Section I</b>					
<b>Notice Inviting Tender (NIT)</b>					
Dell	1	Section 1 NIT	Last date of submission of queries in writing through e-mail from the bidder: Up to 11.00 hrs. 06.12.2016	We also request you to please extend of time by a week to submit the prebid queries.	Bidder request declined. No further extension will be allowed for queries
Techniche	2		Cost of Document: INR 30,000/ (Thirty Thousand only) - non-refundable (inclusive applicable taxes) payable through e-payment by Credit Card/ Debit Card/Net Banking, as per procedure given in e-tender portal.	Bidders who had participated in the last tender should be exempt from paying the cost of the tender. <b>Justification:</b> Since the previous tender was cancelled for no fault of the bidders, they should be allowed the exemption.	Bidder request declined. Provision of tender clause will prevail.
Techniche	3		Tender Security: The total security amount shall be a total of Rs.7,50,000/ (Seven lacs Fifty Thousand Only) payable by RTGS/NEFT/Credit Card/Debit Card/Net Banking as per procedure of E-tender Portal payment	Tender Security shall be accepted in the form of Bank Guarantee also <b>Justification:</b> After the recent Demonitisation there is serious crunch on availability of liquidity in the market. Further a BG is a legal instrument which should be acceptable for such a large EMD amount.	Kindly refer to addendum/corrigendum Item No1.
V3 E & E				We request you to kindly allow us to participate with NSIC exemption for EMD.	Bidder request declined. Provision of tender clause will prevail.
<b>Section II</b>					
<b>Instructions to Bidders (ITB)</b>					
Ricoh	4	2.8	The Service Provider shall submit an affidavit stating that the firm/ company is not / has not been black listed by Central/State Government/ any PSUs/Private Sector/Statutory Authority/World Bank etc. during last 5 years and such blacklisting is still effective on the date of bid submission.	No Mention of Supporting Documents to be submitted. The Service Provider shall submit an affidavit stating that the firm/ company is not / has not been black listed by Central/State Government/ any PSUs/Private Sector/Statutory Authority/World Bank etc. as on the date of bid submission.	Kindly refer to addendum/corrigendum Item No2.
<b>Section III</b>					
<b>Bid Data Sheet (BDS)</b>					
	5	26 II	Bid Security: Rs. 7,50,000/ (Seven Lacs Fifty Thousand Only) Paid online through E-Tender portal - payable by RTGS/NEFT/Credit Card/Debit Card/Net Banking/Bank Guarantee Online as per procedure in E-tender Portal. (Ref. Tool Kit for using e-tender portal enclosed as "Annexure-1 to section 2"		Kindly refer to addendum/corrigendum Item No 3
Vidarbha Infotech	6	30	Taxes prior to Base date i.e. 28 days prior to latest date of submission of Bid is deemed to be inclusive of price quoted by Bidder. (Except Service Tax)	Do we have to quote price including all taxes except Service tax or including Service Tax? Kindly clarify.	Bidder shall quote price including all taxes & duties including service tax also, however break up of taxes considered shall be submitted

Technique	7	33	The successful Bidder will have to deposit a Performance Security @ 10% (Ten Percent) of the awarded value of the work within 28 days of the receipt of the formal order/LOA before the signing of contract agreement. The performance security will be furnished in the form of Bank Guarantee Of Scheduled Commercial Bank, having business office in India and drawn in favor of "Nagpur Metro Rail Corporation Ltd".The performance security should remain valid for a period of 180 days beyond the date of completion of all the contractual obligations of the successful bidder.	This Performance Bank Guarantee will be for an amount equivalent to 10 percent of total contract value. It is the intent of NMRCL that the PBG equivalent to 5 percent of total contract value is returned to the bidder after six months of Project Go-Live. Thus, the bidder needs to submit two PBG's, each equal to 5 percent of value of contract. The validity of the PBGs will be up to 6 months after the contract end date. One PBG will be returned to the bidder six months after project Go-Live. <b>Justification:</b> The suggested condition was given in the previous RFP	Kindly refer to addendum/corrigendum Item No 4.
<b>Section IV</b>		<b>Eligibility Criteria</b>			
Ricoh	8	4.2 A (2)	The Applicant should not have been blacklisted by Government of India or any State government / PSU over the last 5 (Five) years in case of Indian companies. In case of companies registered other than those in India then they should not have been blacklisted by their respective government/government agencies and such black listing is not in force on the date of submission of bid.	Self-declaration duly signed by Authorized Signatory of the Bidder or each member (in case of JV) shall be submitted. The Applicant should not have been blacklisted by Government of India or any State government / PSU on the date of submission of bid in case of Indian companies. In case of companies registered other than those in India then they should not have been blacklisted by their respective government/government agencies and such black listing is not in force on the date of submission of bid	Kindly refer to addendum/corrigendum Item No5.
Technique	9	4.2(B)(1)	The Applicant should have minimum average annual turnover of Rs. 10 Crores in last 3 (Three) years. In terms of rupee equivalent adjusted to last date of the financial year that ended on or before last date of bid submission. By assuming 5% escalation for Indian	The Minimum average annual turnover should be changed to Rs. 50 Crores in last 3 (Three) years.	Bidder request declined. Provision of tender clause will prevail.
V3 E & E	10	Minimum average annual turnover of Rs. 10 Crores in last 3 years but we have 6 Cr. kindly allow us.			
Technique	11	4.2 ( C ) (2)	The Bidder should have experience in successful implementations of IT Infrastructure involving servers, storage, backup solution, Network components & software or IT Network infrastructure Solution with Active and /or Passive network component and is in operation. The bidder should have completed At least One work of the value not less than INR 4 Crore.orAt least two work of the value not less than INR 3 Crore. In organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission	The Experience of the Bidder in an Airport or Large Enterprises or an infrastructure project should also be considered <b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate or Infrastructure projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Infrastructure should be considered.	Kindly refer to addendum/corrigendum Item No 6.
Value Point	12	What about showcasing experience in successful implementation at Autonomous Premier Educational Institutions under Ministry of HRD or large corporates for more than 1000 Crores Turnover?			

Highbar Tech	13			we request department to amend all the experience clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.	
Syntel	14			Can be amended as: "At least on order of INR 3 Crore or At least two works of two crores."	
Virtual Galaxy	15			At least One work of the value not less than INR 4 Crore. OR At least two work of the value not less than INR 3 Crore OR At least Four work of the Combined value not less than INR 16 Crores. in organizations of Indian Central Govt. or State Govt. or PSU or Banking, Financial services and Insurance (BFSI) or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.	
Techniche	16	4.2 ( C) (3)	The bidder should have completed at least one work of providing Facility Management services or IT Maintenance Support in a multi-year contract of value not less than INR 50 Lacs, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.	Experience of providing IT Training or IT Manpower Deployment or Helpdesk Services and Project Management in any project should be considered <b>Justification:</b> Capability & resources of the bidder is established when IT Manpower is deployed or IT training is provided or Helpdesk support for IT infrastructure is provided.	Kindly refer to addendum/corrigendum Item No 7.
Techniche	17			Value of 50 lacs in a single contract should be deleted Justification: FMS and Support contracts are generally given on one year basis and renewed or extended for further period. Hence value should not be made the basis for qualification.	
Highbar Tech	18			we request department to amend all the experience clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.	
IT Craft	19			The work experience demanded is from "Organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail". Similar and even more complex ature of work is handled in Banking, Financial services and Insurance (BFSI). It is thus requested to consider the work experience for all criteria in Banking, Financial services and Insurance (BFSI) too. This will bring in better competition from qualified and capable players.	

Syntel	20			To be amended: The bidder should have completed at least one work of providing Facility Management services or IT Maintenance Support in a multi-year contract of value not less than INR 10 Lacs, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.	
Techniche	21			The Experience of the Bidder in a Large Enterprise or a Corporate or Large Infrastructure Project should also be considered <b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Corporate should be considered.	
Techniche	22	4.2 C (4)	The bidder should have completed at least one work of creation and deployment of Email server and network setup, in last 5 years prior to last date of bid submission.	Please include services for creation and deployment of Active Directory or LDAP creation or proxy server or DHCP services and modify the criteria as "The bidder should have completed at least one work of creation and deployment of Email server or Active Directory or LDAP creation or proxy server or DHCP services and network setup, in last 5 years prior to last date of bid submission." <b>Justification:</b> Deployment of Email Server or Email server or Active Directory or LDAP creation or proxy server or DHCP services are all bundled activities in a Data Center setup and may not be explicitly written in an order. Hence any one of the activities should be considered	Kindly refer to addendum/corrigendum Item No 8.
Vidarbha Infotech	23			Request you to change to 'Servers' instead of 'Email servers'.	

Techniche	24	4.2 ( C ) ( 5 )	The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services and Help Desk System in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.	The criteria for Helpdesk System should be made optional and the condition may be changed as "The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services or Help Desk System. <b>Justification:</b> It may not be necessary for having NMS and Help Desk experience in one single order. Experience of providing NMS and Helpdesk in separate orders effectively justifies the capability of the bidder to address both the services.	Kindly refer to addendum/corrigendum Item No 9.
Highbar Tech	25		we request department to amend all the expereince clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.		
Techniche	26		The Experience of the Bidder in a Large Enterprises or a Corporate should also be considered <b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Corporate should be considered.		
Syntel	27	4.2 C ( 6 )	The Bidder must have a valid quality certification of ISO 9001:2008 or above and ISO 27001:2013 or above.	To be amended: ISO 9001:2008 or ISO 27001:2013	Kindly refer to addendum/corrigendum Item No 10.
Vidarbha Infotech	28			We have applied for ISO 27001 which is expected to be awarded to us shortly. The certificate shall be submitted to NMRCL as soon as it is issued to us. Is this arrangement acceptable?	
<b>Section V</b>		<b>Evaluation Criteria</b>			
		<b>Stage I Technical Evaluation</b>			

Techniche	29	B (1)	<p>The Bidder should have experience in successful implementations of IT Infrastructure involving servers, storage, backup solution, Network components &amp; software or IT Network Infrastructure Solution with Active and /or Passive network component and is in operation. The bidder should have completed. At least One work of the value not less than INR 4 Crore. or</p> <p>At least two work of the value not less than INR 3 Crore. In organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission</p> <p>25 marks per citation up to 4 works for maximum of 100 marks 10 additional marks per workup to 2 citations for maximum of 20 marks if one of the above work is in Railways or Metro.</p>	<p>The Experience of the Bidder in Large Infrastructure project or Large Enterprises or a Corporate should also be considered</p> <p><b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Corporate should be considered. Marks indicated in the Marks allotted column is wrongly written as 120 instead of 100 Additional marks for Large Infrastructure /Airport Projects too should be considered. Airport Projects too are servicing large no of passangers and are similar in complaxity with Railways</p>	Kindly refer to addendum/corrigendum Item No 11.
Highbar Tech	30	<p>10 additional marks per workup to 2 citations for maximum of 20 marks if one of the above work is in Railways or Metro</p>	<p>we request department to amend all the expereince clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.</p>		
IT Craft	31		<p>Requested amendment : The Bidder should have experience in successful implementations of IT Infrastructure involving servers ... in last 5 years prior to last date of bid submission. 25 marks per citation up to 4 works for maximum of 100 marks OR 100 marks for a citation of a single work of INR 16 Crores Marks Allotted for above: 100, 20</p> <p><b>Justification:</b> NMRCL is looking for combined experience of around INR 16 Crores. There may be a bidder who has a done a single job of similar/higher volume and complexity of value much higher that INR 4 Crores. Limiting him for the number of work orders rather than the volume handled shall not be fair. Thus it is requested to also consider a definite value of work done, rather than giving an extra edge to more number of smaller work orders.</p>		

IT Craft	32		<p>Requested amendment : 10 additional marks per work up to 2 citations for maximum of 20 marks for similar work experience in Railways or Metro</p> <p><b>Justification:</b> We fully agree to the advantage given to bidders who have work experience in Railways or Metro. However clubbing this experience with the basic marking system for 120 marks will tilt the things too heavily in favour of Railway or Metro vendors. It is thus requested to consider the experience of bidders irrespective of value of work done for same nature of work in Railways or Metros.</p>
Decos	33		<p>Requested amendment : 10 additional marks per work up to 2 citations for maximum of 20 marks for similar work experience in Railways or Metro</p> <p><b>Justification:</b> Additional marks to bidders with experience in railways and metros would be a clear advantage to such bidders. similar type work in other organisations will not get a fair chance. Kindly consider the experience of bidders irrespective of work done for same nature for railways or metros</p>
Virtual Galaxy	34		<p>At least One work of the value not less than INR 4 Crore. OR  At least two work of the value not less than INR 3 Crore OR  At least Four work of the Combined value not less than INR 16 Crores. in organizations of Indian Central Govt. or State Govt. or PSU or Banking, Financial services and Insurance (BFSI) or global Railways or Metro Rail, in last 5 years prior to last date of bid submission. 25 marks per citation up to 4 works for maximum of 100 marks 10 additional marks per workup to 2 citations for maximum of 20 marks if Bidder has provided similar Facility Management work in Railways or Metro.</p>



Techniche	35	B (2)	The bidder should have completed at least one work of providing Facility Management services or IT Maintenance Support in a multi-year contract of value not less than INR 50 Lacs, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.  25 marks per work upto 3 works for maximum of 75marks	Experience of providing IT Training or IT Manpower Deployment or Helpdesk Services and Project Management in any project should be considered <b>Justification:</b> Capability & resources of the bidder is established when IT Manpower is deployed or IT training is provided or Helpdesk support for IT infrastructure is provided.	Kindly refer to addendum/corrigendum Item No 11.
Highbar Tech	36			we request department to amend all the experience clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.	
Techniche	37			Value of 50 lacs in a single contract should be deleted <b>Justification:</b> FMS and Support contracts are generally given on one year basis and renewed or extended for further period. Hence value should not be made the basis for qualification.	
Virtual Galaxy	38			The bidder should have completed at least one work of providing Facility Management services or Maintenance Support in a multi-year contract of value not less than INR 50 Lacs, in organizations of Indian Central Govt. or State Govt. or PSU or Banking, Financial services and Insurance (BFSI) or global Railways or Metro Rail, in last 5 years prior to last date of bid submission	
Techniche	39			The Experience of the Bidder in a Large Enterprises or a Corporate Large Infrastructure or Airport Projects should also be considered <b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Corporate should be considered.	

Techniche	40	B (3)	The bidder should have completed at least one work of creation and deployment of Email server and network setup, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission	Please include services for creation and deployment of Active Directory or LDAP creation or proxy server or DHCP services and modify the criteria as "The bidder should have completed at least one work of creation and deployment of Email server or Active Directory or LDAP creation or proxy server or DHCP services and network setup, in last 5 years prior to last date of bid submission. <b>Justification:</b> Deployment of Email Server or Email server or Active Directory or LDAP creation or proxy server or DHCP services are all bundled activities in a Data Center setup and may not be explicitly written in an order. Hence any one of the activities should be considered	Kindly refer to addendum/corrigendum Item No 11.
Virtual Galaxy	41		The bidder should have completed at least one work of creation and deployment of Email server and network setup, in organizations of Indian Central Govt. or State Govt. or PSU or Banking, Financial services and Insurance (BFSI) or global Railways or Metro Rail, in last 5 years prior to last date of bid submission		
Highbar Tech	42		we request department to amend all the experience clauses as : in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Large Enterprises, in last 7 (seven) years prior to last date of bid submission.		
Techniche	43		The Experience of the Bidder in a Large Enterprises or a Corporate Large Infrastructure projects should also be considered <b>Justification:</b> Scope of Work and the magnitude is same for Government and Large Corporate projects. Even the responsibility and Services along with the standard of quality of work is same for Large Enterprises or Corporate. Hence the experience of Large Enterprise or Corporate should be considered.		
Virtual Galaxy	44	B(4)	The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services or Help Desk System in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail, in last 5 years prior to last date of bid submission	The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services or Help Desk System in organizations of Indian Central Govt. or State Govt. or PSU or Banking, Financial services and Insurance (BFSI) or global Railways or Metro Rail, in last 5 years prior to last date of bid submission.	Kindly refer to addendum/corrigendum Item No 11.

	45	B(5)	The Bidder must have a valid quality certification of ISO 9001:2008 or above and ISO 27001:2013 or above.	_	Kindly refer to addendum/corrigendum Item No 11.
Technique	46	C (2)	Proposed Solution: Whether the proposed Network Architecture is resilient, uses new technologies, is deployed and operational in existing projects of value 4 crores or more, and more than 500 nodes	Value of orders of 3 crores as per the eligibility criteria too should be included	Kindly refer to addendum/corrigendum Item No 12.
			<b>Stage II Financial Evaluation</b>		
Technique	47	2	Commercial bids that are not meeting the condition mentioned in Section 2.13 shall be liable for rejection.	Reference to section 2.13 is incorrect. Please provide the correct section reference.	Kindly refer to addendum/corrigendum Item No 13
Technique	48	3	The discounted quote is the net present value (NPV)of total cash out flow for NMRCL for Six years discounted at 9%.	Since the contract is for 36 months only, all commercial calculations for evaluation purposes should be done on the basis of 36 months only. Hence the NPV of cash out flow for 36 months should be considered for discounting purposes.	Kindly refer to addendum/corrigendum Item No 14.
		<b>Section VI</b>	<b>Scope of Work</b>		
Amdal	49	6.2(1)	Underlying Strategy: NMRCL has 5 office premises situated in Nagpur city with approximately 250 users; another office complex is being constructed. The new premises will have capacity to house about 500 personnel. The Bidder will create the LAN, Wireless and Video Conferencing at these premises. All offices already have LAN except upcoming Metro Bhavan Building. Drawings for the office layout shall be shared with bidders to estimate material, work and equipment required. The total number of users at NMRCL may be taken at 800 for various calculations in this document.	Kindly confirm exact number of users, because according to point 6.8, NMRCL Locations on page no. 85, number of users comes out to be 1045. It is written that number of users at NMRCL may be taken at 800 for various calculations in this document. So need to know exact number of users for our calculations.	Kindly refer to addendum/corrigendum Item No 15.
IT Craft	50	We are assuming 800 users for all calculations. However, the total number of users at various locations as mentioned in tender doc is suggesting 1045 users. Kindly re-confirm this again. No. Of considered users has to be same by all bidders.			
CMS IT	51	please confirm WAN router sizing needs to be considered for new office complex as well.			
Value Point	52	As per 6.2 its mentioned that apart from new upcoming offneeds to create LAN, As per 6.8 Locations needs to designed,planned, create active and passive network components, kindlyElaborate which locations should be considered and share the location details and users.			
Value Point	53	As compared to 6.2 with 6.8 Number of Users are more Kindly suggest the exact users need to be considred			

Decos	54			The total no .of users is not clear. Kindly confirm the no of users	
CMS IT	55			The Access switch quantity specified in RFP is 15, this may needs to be increased (24 appox.), further sizing can be done during site assessment.	The Minimum quatity for BoQ is given. Bidder shall approve their respective design from NMRCL in design stage
Virtual Galaxy	56			As per pt. 6.8 NMRCL Locations on page no. 85 the number of users comes out to be 1045. Please confirm what will be the base for calculation 1045 or 800 users.	Number of users may be considered as 1100 approximately
CMS IT	57			We understand that below locations needs Wireless LAN, please confirm if any other locations needs to be considered or excluded. 1. Metro House(Civil Lines)                      Head office 2. Udyog Bhavan(Civil Lines)                      Additional office 3. Metro Bhavan New building                      Headquarter Building 4 SBI Building office(Civil Lines)                      GC + OSO 5. Interchange Station (Sitaburdi)                      Station	Kindly refer addendum/corrigendum Item No15
CMS IT	58	6.2(2)	The office building(s), Interchange Station, and Depot will connect to the Data Center via MPLS network in a way that there is an alternate network route available with no single point of failure. Each of the remaining 36 stations will also connect to the Interchange Station and the Depot through a dedicated available NMRCL network. Each station is expected to have an estimate of 10 users each.	please confirm if these locations connectivity and user LAN connectivity setup is already in place.	
IT Craft	59	6.2(4)	OA&IT Network with OFC, Switches, LAN Ports, Patch Panels, and Termination Points at Work Stations at OCC / BCC / Stations / Interchange Stations / Depots & RSS shall be implemented by N1TL01 for operation, maintenance staff of Nagpur Metro & The Contractor shall interface with N1TL01 Telecom Contractor for taking over of existing LAN Network being deployed at OCC, BCC, Depots, Interchange Station and stations. apply and install Network devices including Layer 2/3 switches, Wi-Fi access points, data cabling, patch cord, intelligent patch/Jack panel, as per the given technical specifications, at the Data Center, offices, and other locations, excluding OCC / BCC / Stations / Interchange Stations / Depots & RSS	The mentioned two clauses point towards ambiguity in the scope of work for N1TL01 operations. Is the Contractor expected to take over the existing infrastructure of N1TL01? It is suggested that the existing infrastructure of N1TL01 and the new infrastructure provided by the Contractor are separate. There may be unsuitability of the existing infrastructure with the proposed one and may lead to finger pointing between the two contracts.	
Decos	60			The mentioned two clauses point towards ambiguity in the scope of work for N1TL01 operations. Is the Contractor expected to take over the existing infrastructure of N1TL01? It is suggested that the existing infrastructure of N1TL01 and the new infrastructure provided by the Contractor are separate	

Techniche	61	6.3 (1)	Work Description: Create and deploy the Network Architecture and strategy across all locations using appropriate technologies for connectivity with cost optimized resilience. It is bidder's responsibility to upgrade and integrate the existing LANs if any required. The shortlisted bidder shall survey and submit the BOM for upgrade activity of LAN, unit price of which shall be taken from the BOQ. The Contractor shall interface with N1TL01 - Telecom Contractor for taking over of existing LAN Network being deployed at OCC, BCC, Depots, Interchange Station and stations. Supply and install Network devices including Layer 2/3 switches, Wi-Fi access points, data cabling, patch cord, intelligent patch/Jack panel, as per the given technical specifications, at the Data Center, offices, and other locations, excluding OCC / BCC / Stations / Interchange Stations / Depots & RSS.	Please provide Technical Specification of Intelligent Jack/Patch Panel	Kindly refer addendum/corrigendum Item No15 Annexure I for Technical Specification for Intelligent Jack/Patch Panel
Amdal	62	The Contractor shall interface with N1TL01 Telecom Contractor For taking over of existing LAN Network being deployed at OCC, BCC, Depots, Interchange Station and stations. Kindly differentiate the job responsibilities of bidder and telecom contractor selected for existing LAN network.		Kindly refer addendum/corrigendum Item No15.- Annexure I Addeundum -	
Virtual Galaxy	63	What will be the responsibilities of Telecom Contractor & the Bidder, please confirm?			
Virtual Galaxy	64	Details about primary MPLS line is mentioned, but details about MPLS Backup line is not mentioned in the RFP document, please confirm whether backup line is required or not?		Kindly refer addendum/corrigendum Item No15.- Annexure I Addeundum -	
Virtual Galaxy	65	Detail of redundant internet connection is not mentioned in RFP document, please confirm whether it is required or not?			
Amdal	66	6.3(2)	NMRCL shall procure and deploy the MPLS links and Internet bandwidth across all locations directly from the link providers/ ISPs. However the bidder shall manage the links across the locations.	Kindly confirm whether redundant internet connection is it is required or not as it is not specified in RFP.	Yes , redundant Internet connection shall be required . However it shall be provided by NMRCL
Amdal	67	Kindly confirm whether backup line is required or not as details about primary MPLS line are specified, but details about MPLS Backup line are not specified.			
Amdal	68	6.3(6)	Videoconferencing services to be provisioned at all the offices (currently 3 offices will require 1 VC in conference room each and the Head office shall have 2) as per specifications given in section 6.7	Kindly specify quantity and technical specifications of video conferencing equipments.	Kindly refer to addendum/corrigendum Item No15.
IT Craft	69	Specifications not seen in Section 6.7. No. Of licenses for multi conferencing, device capabilities etc shall have cost implications.			
Virtual Galaxy	70	Technical Specification of Video Conferencing equipment is not given; please provide technical specification of it along with the quantity?			
Techniche	71	6.3 (7)	The bidder shall create and manage the IT infrastructure at the new premises, along with interface and incorporate infrastructure being deployed by N1TL01. The Bidder shall provide IT services and Facilities Management services including the following to NMRCL at all locations specified in this RFP in section 6.8.	Bidder shall be responsible for managing IT infrastructure created and supplied under this tender. However bidder shall coordinate for interface of infrastructure being deployed by N1TL01. Responsibility for managing the infrastructure under N1TL01 shall not be on the bidder	Bidder request declined. Provision of tender clause will prevail.

Amdal	72	6.3(8)	Consult and manage the procurement of laptops, desktops, tablet computers, OS, COTS software and smartphones as required. Bidder to advice on appropriate configuration of devices to be procured and obtain quotes based on which approved devices may be procured by NMRCL.	Kindly specify clearly whether bidder has to only consult NMRCL in procuring COTS software or the bidder will have to supply and install the COTS s/w in the project.	Bidder shall be required to procure software and licenses required for IT infrastructure under scope of work of N1 IT03.
Virtual Galaxy	73			Please confirm whether bidder is required to supply & install COTS software as part of this project or Bidder has to only consult NMRCL in procuring COTS software?	
Value Point	74	6.3(13)	Procure, deploy and manage requisite Hardware and Software for creating Active Directory/LDAP, proxy server, E-mail server, DHCP for NMRCL to allow the users access to resources based on roles, privileges, and responsibilities defined and maintained. Creation, modification of user privileges and rights, suspension of users, password resets, and archiving of users will be managed by the Bidder. The Bidder shall also coordinate with the software vendors to provide authentication to applications through the AD. Architecture should allow domain authentication even in case of network failure. Specifications provided in section 6.7. Total no of users 800	As per 6.2 page no - 37 point 13 need to consider 800 users for mail server,LDAP,Proxy server users, As per 6.8 in RFP users are more kindly Elaborate. And Kindly provide the Features and minimum specification for Proxy server and Email server	Specifications enclosed. Kindly refer to addendum/corrigendum Item No15.
Techniche	75	6.3(14)	Procure and deploy requisite Hardware to provide File & Print services to NMRCL users at all locations. Servers preferably virtualized and storage for such purposes may be deployed at NMRCL premises or the NMRCL third party Data center. Please note that NMRCL has taken a strategic decision to collocate the data center with a third party commercial Data Center provider. The Bidder can take advantage of this and deploy the necessary equipment at the Data Center. Network racks where required at office premises needs to be incorporated in the solution and bidder shall quote for that. In case there is a need for servers or storage to be deployed at NMRCL premises, they may be accommodated in the same network distribution rack. All consumables will be provided by NMRCL and managed by the bidder. Specification provided in section 6	Specifications are given in section 6.7 & not under section 6	Kindly refer to addendum/corrigendum Item No 15.
Techniche	76	6.3(15)	Procure, deploy and maintain an effective centralized client server anti-virus solution for desktops, laptops, and other end user compute devices, totaling 800 users, as per specifications given in Section 6.	Specifications are given in section 6.7 & not under section 6	Kindly refer to addendum/corrigendum Item No 15.
Value Point	77			As per 6.2 page no - 37 point 15 need to consider 800 users for Anti-virus solution As per 6.8 in RFP users are more kindly Elaborate.	Number of users may be considered as 1100 approximately

Techniche	78	6.3(16)	The bidder shall provide appropriate infrastructure setup including Hardware and tape based backup solution for Bidder provided services. As per specifications given in section 6. All consumables will be provided by NMRCL and managed by the bidder	Specifications are given in section 6.7 & not under section 6	Kindly refer to addendum/corrigendum Item No 15.
IT Craft	79	6.4(1)	The bidder shall be responsible for procurement consultancy, configuration and installation of computer devices along with accessories if any, and peripherals, licensed COTS software, and tag the asset.... & Scope of work shall be consisting of Supply / Installation / Commissioning and Maintenance of Hardware items like Servers / Storage / VC / Passive Networking / Active Switching / Firewall / UTM / required COTS Software and Services not limiting to.....	The mentioned two clauses seem contradictory. 6.4(1) indicates that bidder needs to give only procurement consultancy for COTs, whereas 6.1 include Supply / installation / Commissioning and Maintenance of COTS as well. Kindly clarify whether the bidder is required to provide procurement consultancy only or has to supply it as well. In case supply has to be made, quantities and type has to be specified. Kindly bring clarity on this.	Bidder shall be required to procure software and licenses required for IT infrastructure under scope of work of N1 IT03. However for any other software/hardware not included in the scope, contractor shall provide consultancy to NMRCL for procurement of the same.
Decos	80		The mentioned two clauses seem contradictory. 6.4(1) indicates that bidder needs to give only procurement consultancy for COTs, whereas 6.1 include Supply / installation / Commissioning and Maintenance of COTS as well. Kindly clarify whether the bidder is required to provide procurement consultancy only or has to supply it as well.		
Techniche	81	6.4(16)	Server Administrator & Site In-charge – Should have good knowledge and work experience on Windows /LINUX/Client-Server mode/Virtualization. He being the project manager, also should be capable of interaction with the customer and vendor and coordinate activities within the team. He should also be capable of monitoring all the remote sites connectivity through either Leased Line /MPLS WAN. He shall also be capable to monitor all the remote IP based equipment either PC, SERVER, ROUTER, SWITCH, NETWORK PRINTER or any other network equipment through the monitoring tools. He should also have sufficient knowledge of running Network Monitoring Tool & working experience of more than 2 years. He should also be responsible for Generating call reports, analyzing the call statistics, all failure case studies, all Change case studies, and all Configuration case studies. For any sort of new installation or migration, the server administrator should be fully responsible for all sorts of installation of OS (Windows/Linux)	Server Administrator shall be responsible for coordination on all sorts of installation of OS (Windows/Linux) during any sort of new installation or migration. <b>Justification:</b> Since the details of the future new installations/ equipments are not available and the vendors/ OEMS of the new equipments may not be willing to allow others except their registered or trained partners to handle their equipment or installation of OS on them, it is suggested that the role of Server Administrator shall be for coordination and extending all required support in such cases during the contract period.	Bidder request declined. Provision of tender clause will prevail.

Technique	82	6.5 (2)	Network Management: Identification, sourcing, installation, configuration, and comprehensive maintenance of active network devices including switches, , bridges, WIFI access points, modems for which the tentative bill of material is given in Section 10	Specifications are given in section 6.7 & not under section 10	Minimum Bill of quantity is provided in Section 10. Specifications are given in Section 6.7
		<b>6.7</b>	<b>Technical Specifications</b>		
		<b>1</b>	<b>Technical Specification of Core Switch</b>		
Syntel	83		Core Switch :Preferred Make: Cisco / Extreme / juniper / HP	Recommended Switch OS6900-X72	Bidder request declined. Provision of tender clause will prevail.
HPE	84	1	Switch Architecture and Performance: Switch should be equipped with minimum 1 GHZ CPU , 2GB RAM and 4 GB Flash	Switch should be equipped with minimum 4 GB RAM and 1 GB Flash, For switch, CPU and memory or flash is not indicator of performance. Non Blocking Backplane and Wirespeed Throughput are more important.	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	85			Please remove the 1 GHZ CPU and change the Flash to 1GB. Since switches are ASIC based, RAM and CPU and non consequential for performance. Gbps and Mpps is more relevant.	
CMS IT	86		Redundant PSU (both AC and DC supported) and FanTray. Should be hot swappable	We understand that the core switch should support redundant processor, and modular slots, please confirm.	
Dell	87		0°C to 45°C operating temperature and 10% to 95% relative humidity	operating temperature to 0°C to 45°C operating temperature and 10% to 95% relative humidity to 40°C	Kindly refer to addendum/corrigendum Item No 15
Dell	88	3	Layer 2 features: Support for minimum 264 K MAC addresses	Support for minimum 264 K MAC addresses to 128 K MAC	Kindly refer to addendum/corrigendum Item No 15.
HPE	89		Layer 2 features: Should support Private VLAN , Vlan Aggregation , Translation and 802.1v	Should support Private VLAN , Vlan Aggregation , Translation and 802.1v or equivalent. Please explain the meaning of translation as this is not a Layer 2 feature.	
HPE	90		Layer 2 features: Must support Layer2 Ping and Layer 2 Trace route for connectivity and Fault Management	Must support Layer2 Ping and Layer 3 Trace route for connectivity and Fault Management, Layer 2 traceroute uses Cisco Discovery Protocol, which is proprietary.	Kindly refer to addendum/corrigendum Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	91			Please remove the Layer 2 Trace route. Layer 2 traceroute in switch CLI uses Cisco Discovery protocol (CDP) which is proprietary to Cisco. We can do same functionality via NMS to search for Destination MAC address.	



Highbar Tech	92		Layer 2 features:Must support multicast Traceroute	Please remove multicast Traceroute. The multicast traceroute is OEM specific and they are having specific command in their operating system to achieve this. The command is specific to One OEM only	Kindly refer to addendum/corrigendum Item No 15.Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	93			Kindly remove this point, This is a proprietary protocol for a vendor.	
HPE	94	4	Layer 3 features: Support for IP Unicast routing protocols (static, RIPv2, OSPF) from day 1 and upgradeable to ISIS / BGP.	Support for IP Unicast routing protocols (static, RIPv2, OSPF) from day 1 and upgradeable to ISIS / BGP from day one. Please ask the full features from day one as cost of license may be equal or more than switch itself.	No change in requirement. This is bidder's responsibility to propose solution and associated licenses as per requirement .
Highbar Tech	95			Support for IP Unicast routing protocols (static, RIPv2, OSPF) from day 1 and upgradeable to ISIS / BGP from day one. since full features from day one as cost of license may be equal or more than switch itself	
Dell	96			Support for IP Unicast routing protocols (static, RIPv2, OSPF) from day 1 and upgradeable to ISIS / BGP. Need to include ISI/BGP from Day one to benefit the customer and the solution rollout.	
HPE	97		Layer 3 features: Multicast routing protocol with PIM-SM and upgradeable to PIM DM with license	Multicast routing protocol with PIM-SM and upgradeable to PIM DM with license from day one. Please ask the full features from day one as cost of license may be equal or more than switch itself.	No change in requirement. This is bidder's responsibility to propose solution and associated licenses as per requirement .
Highbar Tech	98			Multicast routing protocol with PIM-SM and upgradeable to PIM DM with license from day one. since full features from day one as cost of license may be equal or more than switch itself.	
Dell	99			Multicast routing protocol with PIMSM and upgradeable to PIM DM with license Multicast PIM SM and DM are two different technology to handle the multicast in Layer3, PIMSM is preferred, hence the requirement to ask for PIMSM and PIM SSM or equivalent.	

HPE	100	5	Quality of Service (QoS) Features: Should support Diffserv –RFC 2474, RFC 2475 RFC 2597 and RFC 2598	Should support Diffserv – RFC 2475, RFC 2597. We support only 2475 and 2597 which are latest open standards for DiffServ.	Kindly refer to addendum/corrigendum Item No 15 - Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution. .	
Highbar Tech	101			Please change to 2474 to RFC 3260, Please change RFC 2598 to RFC 3247. RFC 3260 New Terminology and Clarifications for DiffServ is new standard of RFC 2474, RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited		
Dell	102	6	Switch should be scalable to support minimum 5000 Hardware ACLs	As best practice high level of ACL are not to be implemented on the switch, a dedicate Firewall is best proposed here, request to change this to minimum 1000 ACL or more, which cover 5K is some OEM is offering to benefit of the solution. High ACL implementation impacts the wirespeed, latency of the switches.	Kindly refer to addendum/corrigendum Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.	
Syntel	103			Please amend the value to 4K ACLs		
HPE	104		Security Features: Should support Multitenancy for secure traffic isolation with Virtual Router/ Device context or equivalent that allows multiple instances of user created control plane to co-exist within the same switch & router at the same time without overlap, enabling sharing of virtual Router/ switch across business units as individual entity. Each Virtual Router / Device Content will be isolated entity and should not be able to talk to each other within the same box	Kindly remove this point. Multitenancy is for ISP or service provider network with core MPLS P/PE functionality. Not required for this kind of network	N1IT03 is responsible to implement Core equipment and associate network topology as per approved drawing .	
Decos	105			Technical Specification for Routers is not found in the tender document. Specs for routers are missing. All the major technical specifications for various components are mentioned		Router Specs deleted. Kindly refer to addendum/corrigendum Item No 15
IT Craft	106			Technical Specification for Routers is not found in the tender document. All the major technical specifications for various components like Switches, Wireless Controller, Access point etc are mentioned. It would be helpful if similar details for routers are also mentioned herewith.		
HPE	107		Security Features: Should Support mechanism for detection of anomalous protocol behaviour and auto triggering of executable preventive action withing the switch. Should support Protocol based anomaly detection. If required necessary addon component for threat detection should be be quoted	This is not relevant for switch. Anomaly detection is a CPU intensive task and there are deidacted hardware and solution like Firewall, IPS, SIEM tools for this. Enabling this in switch will degrade switch performance even if it is supported.	This is bidder's responsibility to propose solution based on requirement . In case additional hardware is required , bidder to propose same in Technical Proposal to NMRCL for validation.	
Highbar Tech	108			Please remove this Point. Anomaly detection is a CPU intensive task and there are dedicated hardware and solution like Firewall, IPS, SIEM tools for this. Enabling this in switch will degrade switch performance even if it is supported. This point is related to IPS device and this feature is not required in the switch.		

Dell	109		Need more clarification on this requirement, bidder to explore more on the scope of work.	
HPE	110	Security Features: Should support SSH-2, SCP-2 and SFTP with encryption/authentication	Should support SSH-2, and SFTP with encryption / authentication. SCP 2 is proprietary	Kindly refer to addendum/corrigendum Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	111		Please remove SCP-2, SCP is an older protocol but almost universally supported on Unix-like platforms as part of an SSH protocol suite	
Highbar Tech	112	Should support Serial RS232 port ,OOB ethernet management port and USB or External Compact Flash slot	Please change to RJ-45 serial console port. An RS-232 serial port was once a standard feature of a personal computer, used for connections to modems, printers, mice, data storage, uninterruptible power supplies, and other peripheral devices. However, RS-232 is hampered by low transmission speed, large voltage swing, and large standard connectors. In modern personal computers, USB has displaced RS-232 from most of its peripheral interface roles.	No change in requirement. In the specification USB port is already mentioned .
HPE	113	Security Features: Support features / protocol to measure Frame Delay and Latency between devices to pinpoint slow traffic paths	Kindly remove this point. Frame delay and similar technologies are used in Routers for WAN delay. This is not used in switches.	Kindly refer to addendum/corrigendum Item No 15
Highbar Tech	114	9 Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	Please remove this point. Different OEM sis having different mechanism to provide the TAC support	Bidder request declined. Provision of tender clause will prevail. Standards mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	115	Warranty and Certification: Switch should be compliant to following certifications and Safety Regulation : NEBS Level 3, UL 60950, EN 60825-1+A2:2001, CISPR 22: 2006 Ed 5.2, Class A (International Emissions), EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 61000-4-6:2005 Conducted Immunity, MEF9 and MEF14	Please remove NEBS from the clause	Kindly refer to addendum/corrigendum Item No 15
Dell	116		(International Emissions), EC/EN 6100043: 2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 6100046: 2005 Conducted Immunity,MEF9 and MEF14 NEBS and MEF to be removed as these are DC grade enterprise switches, hence not required.	
HPE	117		NEBS is specifically for US Defence and .Switch should be compliant to following certifications and Safety Regulation : UL 60950, EN 60825-1+A2:2001, CISPR 22: 2006 Ed 5.2, Class A (International Emissions), EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 61000-4-6:2005 . MEF is for Metro Ethernet Forum meant for routersConducted Immunit.	

Highbar Tech	118			Please remove the NEBS Level 3,MEF9 and MEF14 Please change EN 60825-1+A2:2001 to EN 60825-Part 1 and EN 60825-1 Safety of Laser Products-Part 2 Justification: NEBS is specifically for US Defence and MEF is for Metro Ethernet Forum meant for routers. NEBS Level 3 is required in Telecommunications industry. NEBS (Network Equipment-Building System) describes the environment of a typical United States RBOC Central Office. NEBS is the most common set of safety, spatial and environmental design guidelines applied to telecommunications equipment in the United States. It is not a legal requirement EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products-Part 2 CISPR 22 Class A is the current standard ,MEF9 and MEF14 is certification for Metro Ethernet. we are not going to use this switch in Metro Ethernet environment	
		<b>2</b>	<b>Technical Specification of Server Farm Switch</b>		
Syntel	119		Server Farm Switch Preferred Make: Cisco / Extreme / juniper / HP	Please Add Alcatel-Lucent	Kindly refer to Corrigendum/Addendum, Item No 15
Syntel	120	1	Switch should have minimum 280 gbps of higher Switching capacity	Please amend the value to 264Gbps	Kindly refer to Corrigendum/Addendum, Item No 15. Preferred OEM names are provided , Bidder to propose suitable model to comply the specification
Highbar Tech	121	Please change it to 176Gbps . For considering 48x 1G port and 4 x 10G port, 176 Gbps switching capacity is required			
Dell	122	Request to change this to 'Switch should have minimum 1200 gbps of higher Switching capacity			
Syntel	123		Switch should be equipped with minimum 1 GHZ CPU , 1GB RAM and 4 GB Flash	Please amend the value to Flash to 2GB	Bidder request declined. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	124			Please remove the 1 GHZ CPU and change the Flash to 512MB. Since switches are ASIC based, RAM and CPU and non consequential for performance. Gbps and Mpps is more relevant.	
Syntel	125		Redundant PSU (both AC and DC supported) and FanTray. Should be hot swappable	Please remove FAN in Architecture	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	126			Please remove the redundant(AC and DC) hot swappable FAN tray and change to AC power supply. Please remove the redundant fan tray and make it hot swappable fan tray	

Dell	127		0°C to 45°C operating temperature and 10% to 95% relative humidity	operating temperature to 0°C to 45°C operating temperature and 10% to 95% relative humidity to 40°C	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	128			Please change 10% to 95% relative humidity to 10% to 90% relative humidity. 10% to 90%, noncondensing is standard relative humidity	
Dell	129	2	Switch should have minimum 48 x 10/100/1000 BaseT and 4 x 10G SFP + / XFP fiber ports. Scalable to support at least 2 x 40G in future.	As this is Server Farm Switch, today all Compute/Server/IP HCI SAN comes with 10G default ports, hence request to change the same as below Switch should have minimum 48 x 1G/10G BaseT and 4 x 40G QSFP + / XFP fiber ports.	Kindly refer to Corrigendum/Addendum, Item No 15. Preferred OEM names are provided , Bidder to propose suitable model to comply the specification
Highbar Tech	130			Please remove Scalable to support at least 2 x 40G in future. If 48 10/100/1000 Base T port is there then there is no need for 40G support required in the switch	
Highbar Tech	131	3	802. 1Q VLAN on all ports with support for 4000 concurrent VLANs, and 802.1 AK for dynamic VLAN propagation	802. 1Q VLAN on all ports with support for 4000 concurrent VLANs, and 802.1 AK or equivalent for dynamic VLAN propagation. IEEE 802.1ak is only supported by Cisco as of now. Therefore request to ask for equivalent.	Kindly refer to Corrigendum/Addendum, Item No 15. Preferred OEM names are provided , Bidder to propose suitable model to comply the specification
Syntel	132		Support for minimum 90 K MAC addresses	Please amend the value to 48 K MAC	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	133			Please change to 32K MAC address. Such a higher MAC address is not required in the switch, please change it to 32K MAC address	
Highbar Tech	134		Should support Private VLAN , Vlan Aggregation , Translation and 802.1v	Should support Private VLAN , Vlan Aggregation , Translation and 802.1v or equivalent. Please explain the meaning of translation as this is not a Layer 2 feature.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM , However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	135		Must support Layer2 Ping and Layer 2 Traceroute for connectivity and Fault Management	Please remove the Layer 2 Traceroute. Layer 2 traceroute in switch CLI uses Cisco Discovery protocol (CDP) which is proprietary to Cisco. We can do same functionality via NMS to search for Destination MAC address.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM , However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.

Highbar Tech	136		Must support multicast Trace route	Please remove multicast Traceroute. The multicast traceroute is OEM specific and they are having specific command in their operating system to achieve this. The command is specific to One OEM only	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Dell	137	4	Support for IP Unicast routing protocols (static, RIPv2) from day 1	Request this to be changed to RIP, OSPF, BGP and ISIS from day one for a uniformed deployment in virtualized environment.	Kindly refer to Corrigendum/Addendum, Item No 15
Dell	138		Support MVR and upgradeable to Support PIM	Request to change to support PIMSM and SSM from day one.	
Highbar Tech	139			Please remove upgradeable to Support PIM. If required please ask for Full Layer 3 feature in the switch	
Highbar Tech	140		Should support policy based routing in hardware	Please remove policy based routing in hardware. PBR already ask in Core Switch and it is not required in the server farm switch. If required please ask for Full Layer 3 feature in the switch	
Highbar Tech	141	5	Should support Diffserv –RFC 2474, RFC 2475 RFC 2597 and RFC 2598	Please change to 2474 to RFC 3260, Please change RFC 2598 to RFC 3247. RFC 3260 New Terminology and Clarifications for DiffServ is new standard of RFC 2474 RFC 3247 Supplemental Information for the New Definition of the EF PHB (Expedited	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Dell	142	6	Switch should be scalable to support minimum 3000 Hardware ACLs	As best practice high level of ACL are not to be implemented on the switch, a dedicate Firewall is best proposed here, request to change this to minimum 1000 ACL or more, which cover 5K is some OEM is offering to benefit of the solution. High ACL implementation impacts the wirespeed, latency of the switches.	Kindly refer to Corrigendum/Addendum, Item No 15

Highbar Tech	143		Should support Multitenancy for secure traffic isolation with Virtual Router/ Device context or equivalent that allows multiple instances of user created control plane to co-exist within the same switch & router at the same time without overlap, enabling sharing of virtual Router/ switch across business units as individual entity. Each Virtual Router / Device Context will be isolated entity and should not be able to talk to each other within the same box	Kindly remove this point. Multitenancy is for ISP or service provider network with core MPLS P/PE functionality. Not required for this kind of network	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	144		Should Support mechanism for detection of anomalous protocol behaviour and auto triggering of executable preventive action within the switch. Should support Protocol based anomaly detection. If required necessary add-on component for threat detection should be quoted	Please remove this point. This is not relevant for switch. Anomaly detection is a CPU intensive task and there are dedicated hardware and solution like Firewall, IPS, SIEM tools for this. Enabling this in switch will degrade switch performance even if it is supported. This point is related to IPS device and this feature is not required in the switch.	
Highbar Tech	145		Should support SSH-2, SCP-2 and SFTP with encryption/authentication	Should support SSH-2, and SFTP with encryption / authentication. Please remove SCP-2, SCP is an older protocol but almost universally supported on Unix-like platforms as part of an SSH protocol suite. SCP 2 is proprietary	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM. However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation. Intended functionality shall be achieved by approved solution.
Highbar Tech	146	7	Should support Serial RS232 port, OOB ethernet management port and USB or External Compact Flash slot	Please change Serial RS232 port to RJ-45 serial console port. An RS-232 serial port was once a standard feature of a personal computer, used for connections to modems, printers, mice, data storage, uninterruptible power supplies, and other peripheral devices. However, RS-232 is hampered by low transmission speed, large voltage swing, and large standard connectors. In modern personal computers, USB has displaced RS-232 from most of its peripheral interface roles.	No change in requirement. In the specification USB port is already mentioned.
Highbar Tech	147		Support features / protocol to measure Frame Delay and Latency between devices to pinpoint slow traffic paths	Kindly remove this point. Frame delay and similar technologies are used in Routers for WAN delay. This is not used in switches.	Kindly refer to Corrigendum/Addendum, Item No 15
Syntel	148	9	Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	OEM depot is vendor specific clause. Please note OEM depots are outsourced to Agency. Only 1 OEM has such facility in India	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	149			Please remove this point. Different OEMs are having different mechanisms to provide the TAC support	

Highbar Tech	150		Switch should be compliant to following certifications and Safety Regulation : NEBS Level 3, UL 60950, EN 60825-1+A2:2001, CISPR 22: 2006 Ed 5.2, Class A (International Emissions), EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 61000-4- :2005 Conducted Immunity	Please remove the NEBS Level 3, Please change EN 60825-1+A2:2001 to EN 60825- 2. NEBS is specifically for US Defence.NEBS Level 3 is required in Telecommunications industry. NEBS (Network Equipment-Building System) describes the environment of a typical United States RBOC Central Office. NEBS is the most common set of safety, spatial and environmental design guidelines applied to telecommunications equipment in the United States. It is not a legal requirement EN 60825-1 Safety of Laser Products-Part 1; EN 60825-2 Safety of Laser Products Part 2 CISPR 22 Class A is the current standard	Kindly refer to Corrigendum/Addendum, Item No 15.
Syntel	151			Please remove NEBS from the clause	
Dell	152			NEBS and MEF to be removed as these are DC grade enterprise switches, hence not required.	
		<b>3</b>	<b>Technical Specification of 24 Port Gigabyte Access Switch</b>		
Syntel	153		24 Port Gigabyte Access Switch - Preferred Make: Cisco / Extreme / juniper / HP	Please Add Alcatel-Lucent	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	154	1	1 x Out of Band IP based management Port , 1 Console Port, USB Port / External Flash	Please remove the 1 x Out of Band port. Console port can be used a out of band management port	Kindly refer to Corrigendum/Addendum, Item No 15.Preferred OEM names are provided , Bidder to propose suitable model to comply the specification
Highbar Tech	155		Support stacking for upto 8 switches with minimum 32 Gbps stacking.	Please changestacking for upto 8 switches to stacking for upto 4 switches. Please change to 4 Switch in stack. Different OEMs is having different no. switch in one stack	
Highbar Tech	156		Have Redundant Power Supply support and variable speed fan to adjust to varying weather conditions in campus	Please remove Redundant Power Supply support. Since these switches would be placed in indoor environments mostly in AC, weather conditions would not hamper operations.	Bidder request declined.
HPE	157			"Have Redundant Power Supply support." Since these switches wuld be placed in indoor environments mostly in AC, weather conditons would not hamper operations.	
Dell	158			Request to support internal Dual hotswap PSU and variable speed fan to adjust to varying weather conditions in campus	Kindly refer to Corrigendum/Addendum, Item No 15



HPE	159	2	Design & Performance: Should be equipped with minimum 1GB RAM and 4 GB flash	Should be equipped with minimum 1GB RAM and 512 MB flash. For the required performance of Backplane and Wirespeed throughput these values are sufficient. 4GB flash will make it specific to a particular vendor.	Bidder Request declined. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.	
Highbar Tech	160			Please change 512MB flash. For the required performance of Backplane and Wire speed throughput these values are sufficient. 4GB flash will make it specific to a particular vendor. Since switches are ASIC based, RAM and CPU and non consequential for performance. Gbps and Mpps is more relevant.		
Dell	161			Request to change this to minimum 2Gbps RMA and 1 Gbps of Flash, as more RAM is required to load the OS and tables in the working memory.		
Syntel	162			Please amend the value to Flash to 2GB		
dell	163		0°C to 50°C operating temperature and 10% to 95% relative humidity	Request to change it to 0°C to 40°C which is standard temperature supported by Major enterprise OEM.		Bidder Request Declined
Syntel	164			Please amend the value to 0 to 45 degree		Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	165	Please change 0°C to 50°C operating temperature to 0°C to 45°C operating temperature and 10% to 95% relative humidity to 10% to 90% relative humidity. Since these switches are placed in indoor environments, 0 to 45 degrees and 10 to 90% humidity is sufficient. For enterprise level switch 0°C to 45°C temperature and 10% to 90% relative humidity is standard				
HPE	166		0°C to 45°C operating temperature and 10% to 90% relative humidity. Since these switches are placed in indoor environments, 0 to 45 degrees and 0 to 90% humidity is sufficient.			
Highbar Tech	167	3	Should have 16 K MAC Address, 1 K active VLAN		No Query Asked	

HPE	168		Should support G.8032 standard based protocol for ring backbone	Should support G.8032 standard based protocol for ring backbone or equivalent. We support Rapid Ring Protection Protocol (RRPP) for the same functionality.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.	
Highbar Tech	169			Please remove G.8032 standard based protocol for ring backbone. Now a days every one is using star technology.so please remove this point We support Rapid Ring Protection Protocol (RRPP) for the same functionality which is not having G.8032 Standard		
Dell	170			G.8032 is still not a standard, and is proprietary protocol, supported by specific OEM, and is not interoperable. Request to remove the same and factor for equivalent, or using IEEE standard based STP/RSTP/MSTP or equivalent ring based protocol. <b>Justification:</b> Ethernet Ring Protection Switching, or ERPS, is an effort at ITUT under G.8032 Recommendation to provide sub50ms protection and recovery switching for Ethernet traffic in a ring topology and at the same time ensuring that there are no loops formed at the Ethernet layer. G.8032v1 supported a single ring topology and G.8032v2 supports multiple rings/ladder topology.		
Highbar Tech	171		Should support policy based routing and switching	Please remove this point. At access level switch Policy based routing is not required	Bidder request declined. Provision of tender clause will prevail.	
HPE	172		Should have basic dynamic routing protocols like RIP from day 1 and be upgradeable to OSPF , PIM , VRRP	Should have basic dynamic routing protocols like RIP from day 1 and be upgradeable to OSPF, PIM, VRRP from day one. Please ask the full features from day one as cost of license may be equal or more than switch itself.	This is bidder's responsibility to propose solution based on requirement . In case additional hardware is required , bidder to propose same in Technical Proposal to NMRCL for validation.	
Dell	173					Request to consider these protocol from day one to benefit of the customer and would be required to deploy the solution.
Highbar Tech	174					Please remove upgradeable to OSPF , PIM , VRRP. At access level Switch OSPF,PIM and VRRP protocol is not required.
HPE	175	4	Should have SSH-2, SCP, SFTP for secure management	Should support SSH-2, and SFTP with encryption / authentication. SCP 2 is proprietary	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.	
Highbar Tech	176					Please remove SCP. SCP is an older protocol but almost universally supported on Unix-like platforms as part of an SSH protocol suite
Syntel	177					

HPE	178	5	Should have L2 Trace route, L2 Ping and Multicast Trace route	Must support Layer2 Ping and Layer 3 Trace route for connectivity and Fault Management. Layer 2 traceroute uses Cisco Discovery Protocol, which is proprietary. Kindly remove this point for Multicast trace. This is a proprietary protocol for a vendor.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	179			Please remove the Layer 2 Trace route and Multicast Trace route. Layer 2 traceroute in switch CLI uses Cisco Discovery protocol (CDP) which is proprietary to Cisco. We can do same functionality via NMS to search for Destination MAC address.The multicast traceroute is OEM specific and they are having specific command in their operating system to achieve this. The command is specific to One OEM only	
Dell	180		Web, Console and CLI management	Request for Console and CLI management only from security purpose and hardening of the switches	Bidder request declined. Provision of tender clause will prevail.
HPE	181		Should be SDN capable with Open stack support and Open Flow API support, Should support IEEE P802.1Qaz	Should be SDN capable with Open stack support and Open Flow API support, Today 802.1qaz is supported only by Cisco. Request to remove that point.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	182			Please remove IEEE P802.1Qaz. IEEE P802.1Qaz is used in Datacenter core switch .IEEE P802.1Qaz, is focused on Enhanced Transmission Selection that will allocate unused bandwidth among the traffic classes including the priority classes specified by 802.1Qau. Together P802.1Qau and 802.1Qaz are part of the IEEE standards to support 'Data Center Ethernet' Today 802.1qaz is supported by one OEM in access switch. Request to remove that point.	
Highbar Tech	183		Inbuilt browser based bandwidth monitoring	Please remove this point. Inbuilt browser based bandwidth monitoring tool is develop by one specific OEM,	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	184			Inbuilt browser based bandwidth monitoring or external solution. We use NMS for this purpose.	

Syntel	185	6	Model should have safety and standards certifications as below : IEC61000-4-6:2008/EN61000-4-6:2009, IEC61000-4-8:2009/EN61000-4-8:2010 ,EN55011:2009+A1:2010, EN55022:2010 Class A, CISPR 22:2008 Class A, ISPR24:2010ClassA, Radiated Immunity 10V/m,80-960MHz,CriteriaA, UL60950-1 2ndEd, CE 2.0 Compliant		No Query Asked
Highbar Tech	186			Please change IEC61000-4-8:2009/EN61000-4-8:2010 to IEC60950-1/EN 61000 Please remove EN55011:2009+A1:2010 Please Remove Radiated Immunity 10V/m,80-960MHz,CriteriaA, CE 2.0 Compliant. IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres. It uses quality assessment specifications that are based on International Standards prepared by the International Electro technical Commission (IEC).	Bidder request declined. Provision of tender clause will prevail. Standards mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	187		Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	Please remove this point. Different OEM sis having different mechanism to provide the TAC support	
		<b>4</b>	<b>Technical Specification of 48 Port Gigabyte Access Switch</b>		
Syntel	188		48 Port Gig Switch - Preferred Make: Cisco / Extreme / juniper / HP	Please Add Alcatel-Lucent	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	189	1	1 x Out of Band IP based management Port , 1 Console Port, USB Port / External Flash	Please remove the 1 x Out of Band port. Console port can be used a out of band management port	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	190		support stacking for upto 8 switches with minimum 32 Gbps stacking.	Please changestacking for upto 8 switches to stacking for upto 4 switches. Please change to 4 Switch in stack. Different OEMs is having different no. switch in one stack	
HPE	191		Have Redundant Power Supply support and variable speed fan to adjust to varying weather conditions in campus	Have Redundant Power Supply support. Since these switches would be placed in indoor environments mostly in AC, weather conditons would not hamper operations.	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	192			Please remove Redundant Power Supply support. Since these switches would be placed in indoor environments mostly in AC, weather conditions would not hamper operations.	
Dell	193			Request to support internal Dual hotswap PSU and variable speed fan to adjust to varying weather conditions in campus	

HPE	194	2	Should be equipped with minimum 1GB RAM and 4 GB flash	Should be equipped with minimum 1GB RAM and 512 MB flash. For the required performance of Backplane and Wirespeed throughput these values are sufficient. 4GB flash will make it specific to a particular vendor.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	195			Please change Should be equipped with minimum 1GB RAM and 512 MB flash. For the required performance of Backplane and Wire speed throughput these values are sufficient. 4GB flash will make it specific to a particular vendor. Since switches are ASIC based, RAM and CPU and non consequential for performance. Gbps and Mpps is more relevant.	
Dell	196			Request to change this to minimum 2Gbps RMA and 1 Gbps of Flash, as more RAM is required to load the OS and tables in the working memory.	
HPE	197	3	0°C to 50°C operating temperature and 10% to 95% relative humidity	0°C to 45°C operating temperature and 10% to 90% relative humidity. Since these switches are placed in indoor environments, 0 to 45 degrees and 0 to 90% humidity is sufficient.	Kindly refer to Corrigendum/Addendum, Item No 15
Highbar Tech	198			Please change 0°C to 50°C operating temperature to 0°C to 45°C operating temperature and 10% to 95% relative humidity to 10% to 90% relative humidity. Since these switches are placed in indoor environments, 0 to 45 degrees and 10 to 90% humidity is sufficient. For enterprise level switch 0°C to 45°C temperature and 10% to 90% relative humidity is standard	
Dell	199			Request to change it to 0°C to 40°C which is standard temperature supported by Major enterprise OEM.	
HPE	200	3	Should support G.8032 standard based protocol or equivalent for ring backbone	Should support G.8032 standard based protocol for ring backbone or equivalent. We support Rapid Ring Protection Protocol (RRPP) for the same functionality.	Bidder request accepted. Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	201			Please remove G.8032 standard based protocol for ring backbone. Now a days every one is using star technology.so please remove this point We support Rapid Ring Protection Protocol (RRPP) for the same functionality which is not having G.8032 Standard	
Dell	202			G.8032 is still not a standard, and is proprietary protocol, supported by specfic OEM, and is not interoperable. Request to remove the same and factor for equivalent, or using IEEE standard based STP/RSTP/MSTP or equivalent ring based protocol.	
Highbar Tech	203		Should support policy based routing and switching	Please remove this point. At access level switch Policy based routing is not required	No change in specification .

HPE	204		Should have Port based VLAN, MAC based VLAN, private VLAN and 802.1 AK for dynamic VLAN propagation	802.1Q VLAN on all ports with support for 4000 concurrent VLANs, and 802.1 AK or equivalent for dynamic VLAN propagation. IEEE 802.1ak is only supported by Cisco as of now. Therefore request to ask for equivalent.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	205		Should have basic dynamic routing protocols like RIP from day 1 and be upgradeable to OSPF , PIM , VRRP	Should have basic dynamic routing protocols like RIP from day 1 and be upgradeable to OSPF, PIM, VRRP from day one. Please ask the full features from day one as cost of license may be equal or more than switch itself.	This is bidder's responsibility to propose solution based on requirement . In case additional hardware is required , bidder to propose same in Technical Proposal to NMRCL for validation.
Dell	206	Request to consider these protocol from day one to benefit of the customer and would be required to deploy the solution.			
Highbar Tech	207	Please remove upgradeable to OSPF , PIM , VRRP.At access level Switch OSPF,PIM and VRRP protocol is not required.			
HPE	208	4	Should have SSH-2, SCP, SFTP for secure management	Should support SSH-2, and SFTP with encryption / authentication. SCP 2 is proprietary	Kindly refer to Corrigendum/Addendum, Item No 15.Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	209			Please remove SCP. SCP is an older protocol but almost universally supported on Unix-like platforms as part of an SSH protocol suite	
HPE	210	5	Should have L2 Traceroute, L2 Ping and Multicast Traceroute	Must support Layer2 Ping and Layer 3 Trace route for connectivity and Fault Management. Layer 2 traceroute uses Cisco Discovery Protocol, which is proprietary. Kindly remove this point for Multicast trace. This is a proprietary protocol for a vendor.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	211			Please remove the Layer 2 Trace route and Multicast Trace route. Layer 2 traceroute in switch CLI uses Cisco Discovery protocol (CDP) which is proprietary to Cisco. We can do same functionality via NMS to search for Destination MAC address.The multicast traceroute is OEM specific and they are having specific command in their operating system to achieve this. The command is specific to One OEM only	

Dell	212		Web, Console and CLI management	Request for Console and CLI management only from security purpose and hardening of the switches	Bidder request declined. Provision of tender clause will prevail.
HPE	213		Should be SDN capable with Openstack support and OpenFlow API support, Should support IEEE P802.1Qaz	Should be SDN capable with Open stack support and Open Flow API support,Today 802.1qaz is supported only by Cisco. Request to remove that point.	Kindly refer to Corrigendum/Addendum, Item No 15.Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	214			Please remove IEEE P802.1Qaz. IEEE P802.1Qaz is used in Datacenter core switch .IEEE P802.1Qaz, is focused on Enhanced Transmission Selection that will allocate unused bandwidth among the traffic classes including the priority classes specified by 802.1Qau. Together P802.1Qau and 802.1Qaz are part of the IEEE standards to support 'Data Center Ethernet' Today 802.1Qaz is supported by one OEM in access switch. Request to remove that point.	
Highbar Tech	215		Inbuilt browser based bandwidth monitoring	Please remove this point. Inbuilt browser based bandwidth monitoring tool is develop by one specific OEM,	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	216			Inbuilt browser based bandwidth monitoring or external solution. We use NMS for this purpose.	
Highbar Tech	217	6	Model should have safety and standards certifications as below : IEC61000-4-6:2008/EN61000-4-6:2009, IEC61000-4-8:2009/EN61000-4- 8:2010 , EN55011:2009+A1:2010, EN 55022:2010 Class A, CISPR 22:2008 Class A, CISPR24:2010ClassA, Radiated Immunity 10V/m,80-60MHz,CriteriaA, UL60950-1 2ndEd, CE 2.0 Compliant	Please change IEC61000-4-8:2009/EN61000-4- 8:2010 to IEC 60950-1/EN 61000 Please remove EN55011:2009+A1:2010 Please Remove Radiated Immunity 10V/m,80-960MHz,CriteriaA, CE 2.0 Compliant. IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres. It uses quality assessment specifications that are based on International Standards prepared by the International Electro technical Commission (IEC).	Bidder Request Declined. Protocols mentioned may differ OEM to OEM ,Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	218		Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	Please remove this point. Different OEM sis having different mechanism to provide the TAC support	

		5	<b>Technical Specification of Wireless LAN Controller</b>		
Syntel	219		Wireless LAN Controller Preferred Make: Cisco / Extreme / HP	Please Add Alcatel-Lucent	Kindly refer to Corrigendum/Addendum, Item No 15
			<b>Hardware</b>		
Dell	210		Hardware Appliance Populated with 50 number of AP licenses from day 1 and scalable to support Scalable to support up to 120 AP per controller	Request to consider for VM based Wireless controller for added advantage and high availability and scalability.	This is bidder's responsibility to propose solution based on requirement . In case additional hardware is required , bidder to propose same in Technical Proposal to NMRCL for validation.
Highbar Tech	211		4 X 1G Interfaces or as per the appliance with 10G preferred.	Please change it to 2 x 1G interface. Different OEM is having different architecture of controller, so number of on board port will be different from OEM to OEM	Bidder request declined. Provision of tender clause will prevail.Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	212		Temperature 0 to 40 degC Humidity 5% to 90%, non-condensing	Please change 5% to 95% relative humidity to 10% to 90% relative humidity . For enterprise level switch 0°C to 45°C temperature and 10% to 90% relative humidity is standard	Kindly refer to Corrigendum/Addendum, Item No 15
HPE	213		It should be deployed in a way that connected wireless users should not face any outage and new users should be able to join in even if the connection to the cotroller goes down or controller gets rebooted. If additional controller is required for this then the same should be quoted.	Redudancy between controllers should be ensured.	Kindly refer to Corrigendum/Addendum, Item No 15
			<b>Architecture</b>		
HPE	214		a) Routed at controller: The WLAN controller acts like a L3 router forwarding the WLAN traffic into the LAN	Kindly remove this point. This fuctionality is proprietary to Cisco as Controller does not perform this function. L3 routing is L2 switch or router fuction.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	215			Kindly remove this point. This functionality is proprietary to Cisco as Controller does not perform this function. L3 routing is L2 switch or router function.	
HPE	216		Radius-Support with Pre Authentication and Pairwise Master Key (PMK) Caching providing roaming transition < 50 ms	Radius-Support with Pre Authentication. PMK Caching is proprietary to Cisco only.	Kindly refer to Corrigendum/Addendum, Item No 15. Preferred OEM names are provided , Bidder to propose suitable model to comply the specification
Highbar Tech	217			Please remove roaming transition < 50 ms. The providing roaming transition < 50 ms is specific to ONE OEM, different OEM is having different timing	



HPE	218		Call Admission Control (CAC) controlled approval of new voice streams	Kindly remove this point. Proprietary to one vendor	No change in specification requirement .Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	219		Supports QBSS (Providing actual load situations to the client to enable intelligent roaming)	Kindly remove this point. Proprietary to one vendor	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	220			Please remove this point. The QBSS (QOS enhanced basic service set) information element is an 802.11e construct that enables an access point to communicate its channel usage to wireless phones. It is intended to solve the problem of candidate access point selection, or intelligent roaming. It is located in the beacon frames of access points. It can be used by QBSS-Capable devices like the Cisco 7921g. It includes three sets of information:	
HPE	221		Supports UAPSD (Unscheduled Automatic Power Save Delivery)	Kindly remove this point. Proprietary to one vendor	Bidder request declined. Provision of tender clause will prevail.
	222		<b>Availability</b>		
HPE	223		Without controller, an AP can RADIUS Server.	Kindly remove this point. Radius server is different than controller function.	Kindly refer to Corrigendum/Addendum, Item No 15
	224		<b>Configuration</b>		
Highbar Tech	225		Supports Wireless Distribution System (WDS)	Please remove this point. This is related to One specific OEM	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	226		Supports Dynamic Meshing to establish load balanced WDS structures	Please remove this point. This is related to One specific OEM	

			<b>Management</b>		
HPE	227		Supports encrypted communication between AP and controller using IPSEC, IKEv2, AES and Diffie-Hellman protocols.	Kindly remove this point. Each vendor has own method of AP controller communication.	Bidder may specify controller method as per options provided and ensure the functionality is achieved
HPE	228		Packet Encapsulation via CAPWAP Tunnelling Protocol	Kindly remove this point. Each vendor has own method of AP controller communication.	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	229			Please remove this point. CAPWAP Tunnelling Protocol is OEM Specific, every OEM is having different tunnelling protocol to communicate between Controller and AP	
HPE	230		Supports autonomous routed IP subnet with separate DHCP service	Kindly remove this point. Proprietary to one vendor	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	231		Optional support of 3rd party AP via dedicated port.	Kindly remove this point. Proprietary to one vendor	Bidder request declined. Protocols mentioned may differ OEM to OEM ,Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	232			Please remove this point. 3rd Party AP will not be supported by the controller because all OEMs are having there own protocol to communicate between AP and controller	
Syntel	233			Please delete the clause	
HPE	234		Supports RFC-3580 tunnel-id adaption into filter rule sets	Kindly remove this point. Proprietary to one vendor	Bidder request declined. Provision of tender clause will prevail.

<b>Guest portal</b>					
HPE	235		Integrated Guest access System:	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	Bidder's request is declined . Bidder to propose cost effective solution as per requirement .Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
HPE	236		customizable log in page	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	
HPE	237		Ticket-Templates	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	
Highbar Tech	238			Please remove this point. This feature is OEM specific which will not supported by the other OEM in the controller	
HPE	239		local account management	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	
HPE	240		ticket administration portal	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	
Highbar Tech	241			Please remove this point. This feature is OEM specific which will not supported by the other OEM in the controller	
HPE	242		Guest access via Captive Portal authentication and limited access for unauthorized clients - Walled Garden	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	
HPE	243		HTML-Editor for portal customization	Kindly remove this whole section of Guest Management. This is dedicated functionality requiring separate solution.	

		6	Technical Specification of Wireless Access Point		
Highbar Tech	244		Access Point (AP) with two independent radio units 802.11a/b/g/n/ac and External Antennae Operating temperature 0 to 50 deg C, Humidity 0%-95%	Please change humidity Humidity 0%-95% to 10% to 90% non-condensing. The standard humidity for network equipment is 10% to 90% non-condensing	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	245		3x3 MiMO , Minimum 3 X Spatial Stream & minimum 75K packet per second on wired port throughput	Please remove 75K packet per second on wired port throughput. In Access point the throughput measure on data rate(Gbps/Mbps)not the packet rate, please change it to data rate	
Syntel	246		Multicast to unicast Conversion on AP	Please remove this clause as Vendor specific feature.	
Highbar Tech	247		Must support optional manual TX power setup in 3db steps per frequency band.	please change 3db steps per frequency band to 0.5 dBm , Every OEM is having different steps per frequency band, please change it to Configurable in increments of 0.5 dBm	
Highbar Tech	248		Roaming and minimum five Qos Profiles according to IEEE 802.11e. Pre standard Legacy applications and clients must be also prioritized.	Please remove five Qos Profiles according to IEEE 802.11e. The number is specific to one OEM configuration so please remove this point.	
Highbar Tech	249		Packet Encapsulation via CAPWAP tunnelling protocol	Please remove this point. CAPWAP Tunnelling Protocol is OEM Specific, every OEM is having different tunnelling protocol to communicate between Controller and AP	
Highbar Tech	250		Onboard Encryption supports Wired Equivalent Privacy (WEP), WPA (WiFi Protected Access) and WPA2 (IEEE 802.11i,AES), IPSec, IKEv2	Please remove this point. Every OEM is having different hardware architecture for encryption	
Highbar Tech	251		Radius-Support with PreAuthentication and Pairwise Master Key (PMK) Caching providing roaming transition < 50 ms Support for Opportunistic Key Caching	Please remove roaming transition < 50 ms. The providing roaming transition < 50 ms is specific to ONE OEM, different OEM is having different timing	
Highbar Tech	252		Netflow support for traffic analysis	Please remove this point. Net flow is OEM specific protocol, please remove this point	
Highbar Tech	253		Simultaneous bridging at AP and tunnelling into the controller and the same SSID	Please remove this point. This is OEM specific	

		<b>Indoor Access Point with integrated Antennae</b>			
Highbar Tech	254		Access Point (AP) with two independent radio units 802.11a/b/g/n/ac and External Antennae Operating temperature 0 to 50 deg C, Humidity 0%-95%	Please change humidity: 10% to 95% non-condensing. The standard humidity is 10% to 95% non-condensing	Kindly refer to Corrigendum/Addendum, Item No 15. F266 Protocols mentioned may differ OEM to OEM, However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation. Intended functionality shall be achieved by approved solution.
Highbar Tech	255		3x3 MiMO, Minimum 3 X Spatial Stream & minimum 75K packet per second on wired port throughput	Please remove 5K packet per second on wired port throughput. In Access point the throughput measure on data rate (Gbps/Mbps) not the packet rate, please change it to data rate	
Highbar Tech	256		Must support optional manual TX power setup in 3db steps per frequency band	please change 3db steps per frequency band to 0.5 dBm. Every OEM is having different steps per frequency band, please change it to Configurable in increments of 0.5 dBm	
Highbar Tech	257		Roaming and minimum five Qos Profiles according to IEEE 802.11e. Pre standard Legacy applications and clients must be also prioritized	Please remove five Qos Profiles according to IEEE 802.11e. The number is specific to one OEM configuration so please remove this point.	
Highbar Tech	258		Packet Encapsulation via CAPWAP tunnelling protocol	Please remove this point. CAPWAP Tunnelling Protocol is OEM Specific, every OEM is having different tunnelling protocol to communicate between Controller and AP	
Highbar Tech	259		Onboard Encryption supports Wired Equivalent Privacy (WEP), WPA (WiFi Protected Access) and WPA2 (IEEE 802.11i, AES), IPsec, IKEv2	Please remove this point. Every OEM is having different hardware architecture for encryption	
Highbar Tech	260		Radius-Support with PreAuthentication and Pairwise Master Key (PMK) Caching providing roaming transition < 50 ms Support for Opportunistic Key Caching	Please remove roaming transition < 50 ms. The providing roaming transition < 50 ms is specific to ONE OEM, different OEM is having different timing	
Highbar Tech	261		Netflow support for traffic analysis	Please remove this point. Netflow is OEM specific protocol, please remove this point	
Highbar Tech	262		Supports mesh capability and Dynamic Mesh creation	Please remove Dynamic Mesh creation. Dynamic Mesh creation is OEM specific technology.	
		<b>7</b>	<b>NAC / Identity Services for Network Visibility</b>		
Syntel	263		Must be from same OEM as wired and wireless and provide centralized management that should be able to manage all network components	Please allow from SAME OEM or OEM partnership for more than 5 years	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	264		Must be able to support minimum 50 IP nodes, 250 Wireless AP and scalable to double the current capacity	Please change it to 50 IP nodes, 200 Wireless AP and scalable to double the current capacity	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	265		Must be able to create correlated topology based on LLDP, SNMP, L2 and L3 protocol connectivity hierarchy	Please remove LLDP, SNMP, L2 and L3 protocol connectivity hierarchy. The Standard topology based on SNMP	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	266		Must support RADIUS and LDAP Authentication for users of the application.	Must support RADIUS and LDAP Authentication or integrate with LDAP for users of the application. LDAP Authentication is a separate functionality which can be interoperated with our solution.	Kindly refer to Corrigendum/Addendum, Item No 15

Highbar Tech	267		Must provide a tool to search and locate the physical location of connected devices and end users, quickly and easily.	Please remove the end device. In wired network end device search location is not possible by Network management tool	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	268		Ability to do Flow analysis (sflow / Netflow / jFlow)	Kindly remove this functionality. This is done by NMS which is already asked.	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	269		Must be able to interact with network security devices and push template based automated response to security events and thus remediating real time threats	Please remove this point. Network security devices are having the different management tool to monitor and configure the network device. because every network security device vendor is having their own security management tool and they are not providing the Sufficient MIBs to monitor the security devices	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	270		Must be scalable to provide open XML APIs for integration with third party applications / Cloud Connect if necessary with additional licenses	Kindly remove this functionality. This is done by NMS which is already asked.	Bidder request declined. Provision of tender clause will prevail.
CMS IT	271		Solution should be with preinstalled OS or dedicated hardware Appliance	Vendor should provide a NAC solution. Hardware details and quantity are not included with shared BoQ.	Bidder request declined. Bidder is responsible to design and propose solution based on requirement to NMRCL .
Highbar Tech	272		Should be provided with 1 + 1 Redundancy for Layer 2 deployment mode that provides high-availability and eliminates single point of failure	Please remove Layer-2 deployment mode. Each OEM s having different architecture for High availability, they may be deployed in Layer-2 Or Layer -3	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	273		Should be able to gather Detailed identity and access information with OS and device fingerprinting for at least 25 different types of OS	Please remove fingerprinting for at least 25 different types of OS. The 25 different types of OS is OEM specific number, Please remove this point	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Highbar Tech	274		Must Support location based Registration portals to redirect Users entering through common SSID to different portals for different Network Zones	Kindly remove this functionality. This is done by Controller and NMS which is already asked.	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	275		Must be able to vulnerability assessment to expose points of penetration for the endpoints	Kindly remove this functionality. This is done by SIEM tools like Arcsight.	Bidder request declined. Provision of tender clause will prevail.
Highbar Tech	276		IPv6 support for implementation in networks with IPv6 end systems.	Kindly remove this functionality. IPv6 is a protocol for Routers, switches, firewalls and devices which communicate on TCP/IP workloads. NAC uses 802.1x workloads.	Bidder request declined. Provision of tender clause will prevail.

		8	<b>Technical and Functional Specifications of UTM</b>		
			<b>Physical attributes</b>		
CMS IT	277		General	Hardware details and quantity are not included with shared BoQ.	Bidder is responsible to propose solution for approval as per functional requirement
Sophos IT	278	1	The proposed vendor must have a track record of continuous improvement in threat detection (IPS) and must have successfully completed NSS Labs' NGFW Methodology v6.0 testing with a minimum exploit blocking rate of 99%	We have ICSA 4.0/EAL4 Common criteria as a part of the product certifications. Apart from that all the modules we offer are IPS,AV, VPN are Checkmark UTM Level 5 certifies which is also an Industry Standard.	Bidder request declined. Provision of tender clause will prevail.
			<b>Performance and Availability</b>		
Sophos IT	279	5	The Firewall should be on ASIC Based architecture with minimum 24 Gbps of Firewall throughput, 5,500,000 concurrent sessions, and 270,000 new sessions per second support from day one and Firewall Latency should not be more than 3µs	Appliance has Multicore based Architecture. Multi-core processors are programmable hence deliver the flexibility and performance needed to help protect against existing and potential threats. Unlike ASIC-based UTMs, multi-core UTMs are fully upgradeable to address the fresh attacks. Inherent technology of multi-core makes it possible to reprogram and quickly deliver new patches and policies online to safeguard the networks. ASIC processor can be considered as a single-lane highway while Multi-core processors can be compared to 4-lane highway designed after considering future needs. Thus, UTMs using multi-core processors deliver significant performance and security advantage over ASIC processor.	Bidder Request declined. Bidder to propose design for approval as per functional requirement mentioned in the clause .
Sophos IT	280	11	The solution should support minimum 10 Virtual Firewalls from day one	Virtual Firewalls are specially used in MSSP's/ISP segments to manage end customer firewalls. Virtual Firewall slows down the system performance and affects the throughput of the appliance. Similar objective to some extent can be managed with the Virtual LAN's which would allow to configure various set of rules for various networks Virtual Firewall concept is needed only in case of a decentralized approach, ie. When one needs to totally give away Firewall administration to a remote/branch site.	Bidder Request declined. Bidder to propose design for approval as per functional requirement mentioned in the clause .
			<b>Routing Protocols</b>		
Sophos IT	281	13	Should support dynamic routing protocol like RIP, OSPF, BGP, ISIS	ISIS is more specifically used at ISP environment for Border lever high end routers. Cyberoam do support other routing protocols vastly used in the organizations.	Bidder request declined. Provision of tender clause will prevail.

			<b>Other Support</b>		
Sophos IT	282	26	The product must supports Layer-7 based UTM/Firewall virtualization, and all UTM features should be supported in each virtual firewall like Threat Prevention, IPS, Web filter, Application Control, content filtering etc.	Virtual Firewalls are specially used in MSSP's/ISP segments to manage end customer firewalls. Virtual Firewall slows down the system performance and affects the throughput of the appliance. Similar objective to some extent can be managed with the Virtual LAN's which would allow to configure various set of rules for various networks Virtual Firewall concept is needed only in case of a decentralized approach, ie. When one needs to totally give away Firewall administration to a remote/branch site.	Bidder to propose design for approval as per functional requirement mentoned in the clause .
Sophos IT	283	32	The solution should have the flexibility to write security policies based on IP Address & User Name & Endpoint Operating System	Policy can be written on based IP Address & User Names. Additionally we can also write	Bidder to propose design for approval as per functional requirement mentoned in the clause .
			<b>Certification</b>		
Sophos IT	284	38	Appliance shall be ICSA certified for Firewall, IPSec VPN, SSL VPN, IPS, AV security functionalities	We have ICSA 4.0/EAL4 Common criteria as a part of the product certifications. Apart from that all the modules we offer are IPS,AV, VPN are Checkmark UTM Level 5 certifies which is also an Industry Standard.	Bidder request declined. Provision of tender clause will prevail.
			<b>9</b>		
			<b>Technical Specifications for NMS (Network Management Software)</b>		
			<b>General Features</b>		
Value point	285		NMS License	Please confirm the devices to be covered under the NMS license are only available in the RFP or any additional, IF any additionl device needs to be considred please provide the quantities	Bidder to propose design for approval as per functional requirement mentoned in the clause .
HPE	286		provides the option to create N level subfolders depends on the need without any restriction	This requirement favours a particular vendor. Need clarity on subfolder. Does it refer to user subgroups?	Yes , it is related to user sub group .
HPE	287		Provision to define the font size use in the view	Already, a web-based solution has been requested. Increasing of the Font can be simply achived by using zoom-in zoom out feature of the browsers	Bidder request declined. Provision of tender clause will prevail.
HPE	288		Able to provide setup type of display format and toolbar as he/she requires for each user account.	This seems to be OEM specific. Pleae modify this . Please reword this as " Ability to setup type o display format as per user roles"	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.



HPE	289		Provision to define the tables structure/number of table/position of tables in the view and the statistics that needs to be displayed in the dashboards and reports	This words in this requirement favours a particular vendor. Is this requirement referring customization capabilities of dashboard?, The Solution should allow basic customization of the dashboard	Bidder request declined. Provision of tender clause will prevail.
Syntel	290		It should allow the user to make the Service Group.	Need more clarification on Service Group	Bidder's query is not clear
Syntel	291		User should able to select any component from different devices like Network interface & device availability from network devices and DB service availability from DB server then Web Service availability from Web Server etc... to configure the Service Group.	Need more clarification on Service Group	
Syntel	292		The overall service availability should be calculated against the service group instead of individual devices or the components.	Need more clarification on Service Group	
Syntel	293		Proposed solution should be capable of monitoring health & performance of IP Phones	Clause need to be deleted as not related NMS	Kindly refer to Corrigendum/Addendum, Item No 15
Syntel	294		Proposed solution should be capable of monitoring IP Cameras	Clause need to be deleted as not related NMS	
Syntel	295		Proposed solution should be capable of capturing log messages from IP Cameras (like SD card removed, camera blocked etc.)	Clause need to be deleted as not related NMS	
<b>Fault &amp; Performance Management</b>					
Syntel	296		Proactively monitors the health & performance of the network		No Query Asked
HPE	297		Provides six-level Severity definition, will handle events automatically and inform the designated person as per operational requirement	This seems to be OEM specific. Please modify this. Provides multiple-level Severity definition, will handle events automatically and inform the designated person as per operational requirement	Kindly refer to Corrigendum/Addendum, Item No 15. Standards mentioned may differ OEM to OEM, However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation. Intended functionality shall be achieved by approved solution.
Syntel	298			Clause need to be diluted to Multi level security as every OEM has their own way of providing security level	

Syntel	299		Displays status of network equipment's / servers/ PCs up to interface level of the equipment	NMS will provide update of only SNMP devices	Bidder request declined. Provision of tender clause will prevail.
Syntel	300		Collect and process specific data to provide the user with the effectiveness of the system, processor, network interface, process and memory of a Windows NT/2000 terminal, workstation, or server		
Syntel	301		Allows the user to measure the Server's performance matrix like CPU, disk, memory utilization and number of concurrent connection and hence assist the user in achieving minimum downtime		
Syntel	302		Displays utilization of CPU, memory and disk of servers/PC and equipment's within the network		
Syntel	303		Provide special views to highlight the performance details of each device		
Syntel	304		Manage distributed, heterogeneous systems - Windows, UNIX & LINUX, including VMWARE ESX from a single management station.		
Syntel	305		Monitor the following parameters in servers : Virtual and physical memory statistics, Paging and swap statistics, Operating System, Memory, Logical disk, Physical disk, Processor, Paging file, IP statistics, ICMP statistics, Network interface traffic, Cache	Clause need to be deleted as not related NMS	Bidder request declined. Provision of tender clause will prevail.
			<b>Reporting</b>		
HPE	306		Reports could be viewed on daily graph (5 minute average), weekly graph (1 hour average minute average), monthly graph (1 hour average) and yearly graph (1 day average)	Reports could be viewed on daily /weekly/monthly/yearly graph	This shall be defined during the design stage as per mentioned functional requirement . .
HPE	307		Provide report on single or multiple statistical split based on the operation need as option during the configuration	This words in this requirement favours a particular vendor. Provide various statistical reports with the option of customization	This shall be defined during the design stage .
HPE	308		Provides 90+ out of the box standard graphical reports with statistical information and with option of customizing and configuring new reports without any limitation in number of reports	Instead of mentioning 90+ reports, please mention some of the important reports that should be made available. The solution musth provide a large no. of out of the box standard graphical reports with statistical information and with option of customizing and configuring new reports without any limitation in number of reports	This shall be defined during the design stage .
Syntel	309		Collect Microsoft Windows NT and Windows 2000 server and above statistics information based on Microsoft Windows Management Instrumentation (WMI)	Clause need to be deleted as not related NMS	Bidder's request is declined .

			<b>Discovery</b>	
Syntel	310		Automatically learn devices that supports SNMP, HTTP, Ping, SMTP, POP3, WMI, PDC, SSH and Telnet along with any required protocol to communicate to the devices.	NMS will provide update of only SNMP devices Bidder request declined. Provision of tender clause will prevail.
Syntel	311		Able to support CDP to discover connections between Cisco devices and NDP to discover connections between Nortel devices	Vendor specific clause. Please delete Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
			<b>Map Topology</b>	
HPE	312		Show the status of the connections based on the dependent connections and the utilization of the links by displaying connection with different width	This seems to be OEM specific. Pleae modify this as Different OEMs have different ways to depict the utilization. The solution should be capable of showing the network connections and the associated interface utilization This shall be defined and approved during the design stage .
Syntel	313		Mouse over options on the resources displayed in the view and right click option on each device to perform device specific operations	Vendor specific clause. Please delete Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	314		Provide Geo Map integration to specify latitude & longitude of devices as per branch location	Vendor specific clause. Please delete Kindly refer to Corrigendum/Addendum, Item No 15
			<b>Network Diagram Builder</b>	
HPE	315		Please refer to all the points that are given under the section Network Diagram Builder	Diagrams for network/server/architecture can be made in a vairyety of ways using multiple tools. This is typically not part of monitoring soluiont. System should have capability to export/import external popular diagramming tools Kindly refer to Corrigendum/Addendum, Item No. 15
			<b>QOS Monitoring (IP SLA/RPM)</b>	
Syntel	316		Monitor QoS based on specific parameters and QoS parameters for various devices like Cisco, Juniper, Maipu, etc.	Vendor specific clause. Please delete Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	317		Measure & monitor the following QoS parameters :Latency, Packet loss,Probes,Packets,Delay,MOS,Jitter, 00RTT (Round-Trip-Time)	Vendor specific clause. Please delete

			<b>Flow Monitoring</b>		
HPE	318		Solution should have a network map highlighting utilization of all flow exporting devices	This seems to be OEM specific. Please modify this	Bidder request declined. Provision of tender clause will prevail.
HPE	319		Map should have an option to use Google Map as background	This seems to be OEM specific. Also it is not clear why this features is being clubbed with Google Maps. This will not be available with of the the vendors. Solution should have a network map highlighting all flow exporting devices	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	320			Vendor specific clause. Please delete	
HPE	321		In case of a network threat the tool should have capability to provide IT teams the level of deep visibility needed to quickly uncover malware, scope a compromise, and contain the infection before it spreads and causes further damage	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail.
HPE	322		Tool should use global threat intelligence to strengthen network defenses	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail.
Syntel	323			Vendor specific clause. Please delete	
Syntel	324		Tool should be capable to identify DNS abuse, command and control traffic, and data theft	Vendor specific clause. Please delete	Bidder request declined. Provision of tender clause will prevail.
HPE	325			This is typically part of security and Incident Management. Is SIEM in scope?	
HPE	326		Tool should help to pinpoint exactly when an end system was compromised, as well as which other systems may have been affected by the malware's lateral movement through your network	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail.
HPE	327		It is able to detect DDOS attacks, DNS hits, NULL scans, SYN violations, FIN violations, P2P etc.	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	328			Vendor specific clause. Please delete	
Syntel	329		The traffic monitoring application should proactively analyze flow data to gather and consolidate real time information that allows for faster troubleshooting and less downtime	Vendor specific clause. Please delete	Bidder request declined. Provision of tender clause will prevail.
HPE	330		Solution should support a visual tracker of the propagation of malware across the network to identify the route of the malware and identify the victims	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail.

HPE	331		Solution should support a Cyber Threats Dashboard showing the security posture of the network with a simple way to find root cause events such as Policy Compliance, Traffic Spikes, Worm Activity and user activity in both real time and in historical context	This is typically part of security and Incident Management. Is SIEM in scope?	Bidder request declined. Provision of tender clause will prevail.
<b>Monitoring of Infrastructure Services</b>					
Syntel	332		IIS / Tomcat / Web server statistics	Vendor specific clause. Please delete	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	333		HTTP service, HTTPS service, FTP server statistics, POP / SMTP services, ICMP services	Vendor specific clause. Please delete	Bidder request declined. Provision of tender clause will prevail.
Syntel	334		Database Services – Monitor various critical Relational Database Management System (RDBMS) parameters such as database tables / table spaces, logs etc.	Vendor specific clause. Please delete	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
<b>Virtualization Monitoring</b>					
Syntel	335		Monitor VMWare ESXi servers, Hyper Servers, Xen servers, KVM and all market standard virtualization environment	Vendor specific clause. Please delete	Bidder request declined. Provision of tender clause will prevail. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	336		Monitor important server parameters like CPU, Memory, Disk Utilization for virtual servers		
Syntel	337		Monitor network utilization & bandwidth of virtual servers		
Syntel	338		Track number & Speed of CPU cores, number of CPU threads, number of network adapters of virtual servers		
Syntel	339		Track resources (memory, CPU, storage) allocated to Guest OS systems running on the VM servers		
Syntel	340		Generate health & utilization reports for Physical VM / Hyper servers		
Syntel	341		Generate guest OS resource utilization reports for each Physical VM / Hyper servers		
Syntel	342		Create multiple dashboards for Virtualization Monitoring highlighting important monitoring parameters		

<b>Deployment Architecture</b>					
HPE	343		Provide the option to keep the Correlator Engine separated from the other engines depends on the scale	This is with respect to Architecture that would vary from vendor to vendor having equal advances/disadvantages. The Solution should support a distributed architecture for deployment	Bidder request declined. Provision of tender clause will prevail.
HPE	344		Provide the option to keep the Alert / Notification Engine separated from the other engines depends on the scale	This is with respect to Architecture that would vary from vendor to vendor having equal advances/disadvantages. The Solution should support a distributed architecture for deployment	Bidder request declined. Provision of tender clause will prevail.
Syntel	345		Provides event configuration where any selected node once being monitored goes down, an alert/event is generated and will be shown on the alarms browser		No Query Asked
<b>Integration Capabilities</b>					
Syntel	346		Ticketing / incidents should be able to integrated with the CRM or Customer portal Etc.	Vendor specific clause. Please delete	Kindly refer to Corrigendum/Addendum, Item No 15. Protocols mentioned may differ OEM to OEM ,However based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation .Intended functionality shall be achieved by approved solution.
Syntel	347		Provide CORBA based system to communicate with external software	Vendor specific clause. Please delete	

		10	Technical Specifications for Help Desk System		
HPE	348		Add Clause	<p>Request department to consider following functionality of Helpdesk Solution should allow for a Smart Ticket feature to quickly submit a Service Desk ticket by just entering a description or attaching a screenshot. Solution should intelligently populate other fields such as category or affected services by extracting and analyzing the content that you entered in the ticket. Helpdesk should provide modern data analysis methods for insight and value to service desk by leveraging unstructured as well as structured data Values and benefits</p> <ul style="list-style-type: none"> <li>• Simple incident and service request submittal</li> <li>• Fast classification</li> <li>• Instant visualization of problem areas</li> <li>• Quick time-to-value</li> </ul>	Bidder request declined.
HPE	349		Add Clause	<p>Request department to consider following functionality of Helpdesk. Helpdesk should provide a Hot Topic Analytics feature and should intelligently display an interactive diagram indicating the hot topics among recent incidents so that users can easily discover incident trends and their relative impacts, and identify problem candidates.</p> <p>Helpdesk should provide modern data analysis methods for insight and value to service desk by leveraging unstructured as well as structured data Values and benefits</p> <ul style="list-style-type: none"> <li>• Simple incident and service request submittal</li> <li>• Fast classification</li> <li>• Instant visualization of problem areas</li> <li>• Quick time-to-value</li> </ul>	Bidder request declined.

		11	<b>Technical Specification for Asset and Patch Management</b>		
			<b>Basic Requirements</b>		
HPE	350		Solution should be Hardware appliance or virtual appliance based, plug & play system	What is the reason for specifically looking for an appliance based solution. It is only a choice of deployment architecture. Solution should be easy to deploy and should support multiple platforms	Bidder request declined. Provision of tender clause will prevail.
HPE	351		Solution should support All the major multi vendor Endpoints i.e Laptop, Desktop, Servers, Thin Clients, Virtual Machines, Chrome box, Network Devices etc.	The Proposed solution should not limit inventory to Desktops only. It should discover and keep an inventory of desktop, laptops, servers, network and any IP enabled device. To ensure that all IT Environment is covered. The IT asset Register should be comprehensive and should not focus only on desktop. There are important softwares installed on servers as well. Inventory solution should cover server environment as well for hardware as well as software inventory	Bidder request declined. Provision of tender clause will prevail.
HPE	352		Anywhere, anytime, any device access for both administrators and end users the mobile app support	Access to the console should be possible from multiple devices including mobile. Typically Mobile Support does not necessarily require a native app. Mobility support can be provided through m sites/HTML 5 which also provide the advantage of not having to maintain and update native apps. Anywhere, anytime, any device access for both administrators and end users through both web and mobile platforms	Bidder request declined. Provision of tender clause will prevail.
			<b>Simple &amp; Secure Administration</b>		
HPE	353		Solution must provide native Mobile App that allow users or administrator to connect using mobile device running on Android or IOS	Access to the console should be possible from multiple devices including mobile. Typically Mobile Support does not necessarily require a native app. Mobility support can be provided through m sites/HTML 5 which also provide the advantage of not having to maintain and update native apps. Anywhere, anytime, any device access for both administrators and end users through both web and mobile platforms	Bidder request declined. Provision of tender clause will prevail.
HPE	354		Solution must use 2048-bit encrypted communication across all protocols and file transmissions. Solution must provide usage of MD5 checksums for file transmissions and integrity validation	Application Security can be ensured using multiple ways and using multiple protocols/encryption keys as well as encryption algorithms. The choice in the RFP is very restrictive. The Solution ensure adequate security measures including encrypted communications and data integrity checks in place	Bidder request declined. Provision of tender clause will prevail.



		<b>IT Inventory &amp; Asset Management</b>			
HPE	355		It should provide inbuilt software catalogue for the more than 80000 software , which will help in auto categorization, uncatalogued software, and License Management	Instead of mentioning more than 80,000 software, can the customer provide the most important software that need to be complied with	Kindly refer to Corrigendum/Addendum, Item No 15
HPE	356		Software Distribution	Does this refer to only Desktop and laptops or it covers Server Environment as well. These activities are critical for Servers as well. Full Server Automation can also save time, ensure policy enforcement and improve compliance	This is applicable for desk top , laptop and server as well .
HPE	357		Patch Management	Does this refer to only Desktop and laptops or it covers Server Environment as well. These activities are critical for Servers as well. Full Server Automation can also save time, ensure policy enforcement and improve compliance	This is applicable for desk top , laptop and server as well .
Techniche	358	6.8	Nagpur Metro has the following locations where the IT infrastructure has to be designed, planned, created, and maintained. The components include Active and Passive network components, connectivity within the premises and to the primary network that links to the Data Center. The bidder is required to submit a network architecture diagram defining the network topology, active and other passive components like switches, Routers, hubs, access points, etc. cabling requirements at each location and requirements at each location, e.g. enclosed area for installing a network rack, conduits for laying the cables, cooling requirements for the equipment, etc.	The list of locations include Depot, CPM offices and Stations.Please confirm the final list of locations where the IT infrastructure under this tender has to be implemented and the bidder will be responsible for. The location list is in contradiction with the locations mentioned elsewhere in the RFP.	Updated Locations are Given. Kindly refer to Corrigendum/Addendum, Item No 15
Decos	359	Specification of the location required for planning and design. Network Architecture design will be the core of the planning specification of 8 location mentioned in this clause would be helpful			
CMS IT	360	Is the Data Center & DR locations are already in place, or these locations needs to be connected with HO.			
IT Craft	361	Location of data centre needs to be specified. There are 8 locations mentioned in this clause. It will be very helpful if the bidders get a clear understanding of the location of the planned “ Data Centre” to plan the network architecture and team distribution			
Virtual Galaxy	362	Location of Data Center & location of Servers is not mentioned in the RFP document, Please confirm?			
CMS IT	363	Is the connectivity and network setup between 2 metro stations will be part of this RFP, if yes, how the network needs to be planned (LAN/Wireless).		Connectivity between metro station shall be established by N1TL01.	

Section VII		Condition of Contract			
Amdal	364	7.2	Payment Schedule	Please confirm the payment schedule, as we have to make immediate payments to the OEMs for the materials procured from them.	Kindly refer to Corrigendum/Addendum, Item No 16
Techniche	365			The given percentage of payment against each milestone do not amount to 100% payment. Please check and correct the milestone payment percentages to sum upto 100%	
	366	7.3	Advance Payment: 10% advance amount of accepted contract value shall be paid to successful bidders on submission of Bank Guarantee of 110% of requested amount, issued from scheduled commercial bank having business office in India.	–	Kindly refer to Corrigendum/Addendum, Item No 17
Techniche	367	7.4	Performance Guarantee: The successful bidder shall, within 28 (Twenty Eight) working days of the date of issuance of PO, provide an unconditional and irrevocable Performance Bank Guarantee (PBG) from a scheduled commercial bank @10% of the contract price with an initial validity up to 180 days beyond the end of the scheduled completion period of the supplies. Performance Bank Guarantee (PBG) shall be in the format prescribed in Section 8 Form C-3, payable on demand, for the due performance and fulfilment of the contract by the bidder.	This Performance Bank Guarantee will be for an amount equivalent to 10 percent of total contract value. It is the intent of NMRCL that the PBG equivalent to 5 percent of total contract value is returned to the bidder after six months of Project Go-Live. Thus, the bidder needs to submit two PBG's, each equal to 5 percent of value of contract. The validity of the PBGs will be up to 6 months after the contract end date. One PBG will be returned to the bidder six months after project Go-Live.	Kindly refer to Corrigendum/Addendum, Item No 18.
Techniche	368	7.9	Penalty Clause: Notwithstanding anything to the contrary contained in this RFP, the maximum penalty payable by the Bidder shall be capped at 10% of the total contract amount paid to the Bidder under this RFP. Further, liquidated damages mentioned herein shall be imposed on the Bidder only if the default, breach, or delay is solely attributable to the Bidder and should be levied only after due consultation with the Bidder and ascertaining the cause of the default/breach/delay in question.	The penalty for FMS services shall be capped at 10% of the value of services for that particular year only.	This is standard Clause, Tender Conditions Prevail
Section VIII		Bidding and Contract Forms			
	369	B7	Affidavit for non blacklisting	–	Kindly refer to Corrigendum/Addendum, Item No 19
	370	B9	New Form added	–	Kindly refer to Corrigendum/Addendum, Item No 20
	371	C1	Letter of Acceptance	–	Kindly refer to Corrigendum/Addendum, Item No 21
	372	C4	Advance Payment Guarantee	–	Kindly refer to Corrigendum/Addendum, Item No 22

Section X		Financial Bid			
Technique	373	10.1	Summary of Components: C0 is the subtotal of consolidated capital investment quoted by the bidder for the Pre Go-LIVE phase	Since there is no defined parameters for Go Live and the same is dependent on site availability, determination of a fixed date for C0 is not feasible. As such C0 column should be deleted.	Bidder request declined. Provision of tender clause will prevail.
Technique	374	10.3	Bill of Material - Network Equipment The network equipment specified below is indicative, the bidder has the option to choose alternative technology solutions with similar features and capabilities as long as the entire solution delivers the requisite connectivity across the locations. The detailed technical specification sheet attached below. Wireless network across all locations need to work seamlessly for any user moving from one location to another without having to reselect the network name or re-authenticate using passwords or any other mechanism.. Apart from the quantities mentioned herein, the bidder shall provide prices for unit quantities for future purchases as required.	Please note that since this is a design based project as such only the BOM should be mention the BOQ should be left to the Bidders to derive/justified by each bidder as part of their proposed solution, It seems certain Items like Cots software solutions, Intelligent Patch Panel etc. are missing from the BOM given in the Tender Document, we would request you to include such items and incorporate the technical specification in the Tender Document. In the absence of uniformity of the BOM, Bidders may offer uncompareble BOQ may miss out of certain Items which will creating difficulties for evaluation.	BoQ is minimum quantity to be supplied
Value point	375			To provide prices for unit quantities for future purchases ? Please elobrote this point	Bidder need to quote prices of hardware & software & quantity to be supplied by him. Based on this total cost shall be calculated.
	376	10.2	Details of Cost Components	-	Kindly refer to Corrigendum/Addendum, Item No 23
Amdal	377	10.3(1)	Routers	Please mention technical specifications of routers as it is not mentioned in RFP document.	router deleted. Kindly refer to Corrigendum/Addendum, Item No 15
Virtual Galaxy	378			Technical Specification of Routers is not mentioned in RFP document, kindly specify the same?	
Amdal	379	10.3(8)	Network rack 42 U	Kindly clarify whether quantity of 42 U n/w rack is variable or fixed. Kindly clarify whether mentioned quantity is for server or for network use.	The Minimum quantity is given. Bidder shall approve their respective design from NMRCL in design stage
Decos	380			Normafly rack 42 U is used for servers. If it is to be considered as network rack, kindly suggest the rack for servers and san storage. In this case, the specifications need to be clarified on. Clarity on server and network racks shall be useful for commercial analysis and network architecture	Server and network rack shall be provided with the dimension of 2200 Hx1000 Dx800 W mm . As standard telecom rack from reputed makes shall be having front glass door that rear portion shall be perforated
Virtual Galaxy	381			Please confirm the mentioned quantity is for Server or Network? Qty of 42 U N/W rack is variable or fixed?	This BoQ is given for Minimum quantity
Syntel	382	10.3(15)	VC equipment with accessories – 03 Nos	Please incorporate Our Technical Specifications of VC units in the tender	Bidder request declined. Provision of tender clause will prevail.
	383	10.3(16)	Server in redundancy	-	Kindly refer to Corrigendum/Addendum, Item No 24
Amdal	384	10.3	Servers and Storage	Kindly confirm location of the data center and servers as it is not specified in RFP.	Updated Locations are provided. Kindly refer to Corrigendum/Addendum, Item No 15

	10.3	Passive Equipment			
Value point	385	1	Cat6E Cables	In Industry standard is referred as cat6 which provides 1 gig network and cat6A which is for 10 gig bandwidth. Specification required. Quantity required	Bidder's request is declined .Kindly refer to Corrigendum/Addendum, Item No 24
Value point	386	2	Network rack 42 U, 24 U, 12 U	No Dimension. Specification required with dimension. Open or Closed rack and Quantity required	All racks shall be closed , front glass and back perforated . Details shall be finalised during the design stage .
Value point	387	4	Patch cords Per cable 3 feet, 6 feet Other size as required)	Industry standard is 4 ft or 7 ft . Please revert	Kindly refer to Corrigendum/Addendum, Item No 24
Value point	388	General	Design Document	Not provided. Need design document and standards, scope doc needed	design to be done by bidder
Value point	389	General	LS	LS in qty column mentioned. Need accurate quantity for each line item	To be calculated by bidder
Value point	390	General	Information outlet	No Spec mentioned. Depending on the design and cable chosen cat6 or cat6A - clarity needed	cable is cat6e STP Type. Kindly refer to Corrigendum/Addendum, Item No 24
Value point	391	General		Make is not mentioned for Passive equipment. If any preference, need to be specified	Kindly refer to Corrigendum/Addendum, Item No 24

Amdal	392	<p><b>Manpower</b> :Contractor to deploy experienced technical staff deployed by the contractor as per following. Following is minimum number (not exhaustive) TOTAL 12 PERSONS (Twelve: ON-SITE) must be kept for Facility Management at Nagpur Metro Rail Office by the Contractor.</p>	Kindly clarify the operations of proposed work will be carried out in how many shifts?	Kindly refer to Corrigendum/Addendum, Item No 24
Virtual Galaxy	393		Please confirm the hours of operation of the project 24X7 in 2 shifts or 3 shifts?	
Virtual Galaxy	394		Please confirm the readiness of project for installation of Networking items & deployment of required manpower. Is successful bidder required to procure all the quantity of Networking items at a time or in stages?	Delivery shall be stage wise
IT Craft	395		6 personnel shall be required at Metro Bhavan. Apart from that, one personnel at each office is expected to be placed. Can we get clarity on the precise number of locations where the personnel have to be deputed? Also, the minimum number of persons should be aligned to the specified number of locations and not locked at 12. The response time again is quite challenging and hence 12 personnel seem very less. <b>Justification:</b> Doing the financial calculations, assuming 12 personnel may not justify the cause and response time. Secondly, if any non serious bidder does the submission based on 12 personnel, the others may not compete fairly based on project cause.	Bidder to propose detailed man power deployment plan and top of minimum required provided in the tender . Detailed plan shall be reviewed by NMRCL .
Amdal	396		Please let us know the development stages of this project as we will have to plan out the deployment of project resources and supply & installation of networking equipments. Do we have to deploy & implement all the resources & equipments at a time or in stages? Accordingly we shall plan out procurement of equipments from OEM?	Deployment shall be stage wise . Schedule for the deployment shall be finalised with N1 IT03 .

**NAGPUR METRO RAIL PROJECT**

**ADDENDUM/CORRIGENDUM**

**FOR**

**SUPPLY, DESIGN & COMMISSIONING OF IT NETWORK, IT INFRASTRUCTURE  
AND PROVISION OF FACILITY MANAGEMENT SERVICES**

**TENDER NO.**

**N1IT-03/2016**

**DECEMBER-2016**



**Nagpur Metro Rail Corporation Limited**

**Metro House, Bungalow No: 28/2,**

**Anand Nagar, CK Naidu Road,**

**Civil Lines, Nagpur-440001**

**Maharashtra, INDIA**

**Website: <http://www.metro railnagpur.com>**

## Section 1, Notice Inviting Tender (NIT)

### 1. Replace the existing provision of Tender Security with following

Tender Security	The total security amount shall be a total of <b>Rs.7,50,000/-</b> (Seven lacs Fifty Thousand Only) payable by <b>RTGS/NEFT/Credit Card/Debit Card/Net Banking/Bank Guarantee</b> as per procedure of E-tender Portal payment
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## Section 2, Instruction To Bidders (ITB)

### 2. Replace the existing provision of ITB 2.8 with following

The Service Provider shall submit an affidavit provided in Section 8 Bidding and Contract forms Form B7 stating that the firm/ company is not / has not been black listed by Central/State Government/ any PSUs/Private Sector/Statutory Authority/World Bank etc. during last 5 years from the date of bid submission.

## Section 3, Bid Data Sheet (BDS)

### 3. Replace the existing provision of ITB 26 II with following

**Bid Security: Rs. 7,50,000/ (Seven Lacs Fifty Thousand Only)** Paid online through E-Tender portal - payable by **RTGS/NEFT/Credit Card/Debit Card/Net Banking/Bank Guarantee Online** as per procedure in E-tender Portal. (Ref. Tool Kit for using e-tender portal enclosed as “**Annexure-1 to section 2**”

### 4. Replace the existing provision of ITB 33 with following

The successful bidder shall at his own expense deposit with NMRCL, within twenty eight days(28) from the date of issuance of PO, an unconditional and irrevocable Performance Bank Guarantee (PBG) from a scheduled commercial bank, in the format prescribed in Section 8, payable on demand, for the due performance and fulfilment of the contract by the bidder.

This Performance Bank Guarantee will be for an amount equivalent to 10 percent of total contract value. It is the intent of NMRCL that the PBG equivalent to 5 percent of total contract value is returned to the bidder after six months of Project Go-Live. Thus, the bidder needs to submit two PBG's, each equal to 5 percent of value of contract. The validity of one PBG will be up to 6 months after the Project Go-Live and second PBG shall be up to 6 months after the contract end date respectively. One PBG will be returned to the bidder six months after project Go-Live .

PBG shall be invoked by NMRCL in the event the Bidder/Agency:

1. Fails to perform the responsibilities and obligations as set out in the RFP to the complete satisfaction of NMRCL including failure to comply with exit management responsibilities.
2. Misrepresentations of facts/information submitted to NMRCL.

The PBG may be discharged / returned by NMRCL upon being satisfied that there has been due performance of the obligations of the bidder under the contract. However, no interest shall be payable on the performance bank guarantee. In the event of the bidder being unable to service the contract for whatever reason, NMRCL would invoke the PBG. Notwithstanding and without prejudice to any rights whatsoever of NMRCL under the contract in the matter, the proceeds of the PBG shall be payable to NMRCL as compensation for any loss resulting from the bidder's failure to perform/comply its obligations under the contract. NMRCL shall notify the bidder in writing of the exercise of its right to receive such compensation within 40 days, indicating the contractual obligation(s) for which the bidder is in default. The bidder will have the opportunity to cure the deficit in service or breach in the service level to the satisfaction of NMRCL.

NMRCL shall also be entitled to make recoveries from the bidder's bills, performance bank guarantee, or from any other amount due to him, an equivalent value of any payment made to him due to inadvertence, error, collusion, misconstruction or misstatement. On satisfactory performance and completion of the order in all respects and duly certified to this effect by the Project Coordinator, Contract Completion Certificate will be issued and the first PBG will be returned to the bidder.

## **Section 4, Eligibility Criteria**

### **5. Replace the existing provision of 4.2 A (2) with following**

The Applicant should not have been blacklisted by Government of India or any State government / PSU /Private Sector/Statutory Authority/World Bank etc. during last 5 years from the date of bid submission. In case of companies registered other than those in India then they should not have been blacklisted by their respective government/government agencies during last 5 years from the date of bid submission.

Format as per given in Form B7 in Section 8 Bidding and Contract Forms shall be submitted by Bidder or each member (in case of JV)

### **6. Replace the existing provision of 4.2 C (2) with following**

The Bidder should have experience in successful implementations of IT Infrastructure involving servers, storage, backup solution, Network components & software or IT Network Infrastructure Solution with Active and /or Passive network component and is in operation. The bidder should have completed

At least One work of the value not less than **INR 4 Crore.**

OR

At least two work of the value not less than **INR 3 Crore**

in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airports or Large Enterprise in last **5 years** prior to last date of bid submission

Purchase orders or Project completion or Installation certificate from Client(s) of the referred projects shall be submitted.

### **7. Replace the existing provision of 4.2 C (3) with following**



The bidder should have completed at least one work of providing Facility Management services or IT Maintenance Support in a multi-year contract of value not less than **INR 50 Lacs**, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airports or Large Enterprises in last 5 years prior to last date of bid submission.

Purchase orders or Project completion or Installation certificate from Client(s) of the referred projects shall be submitted. Cumulative value will be considered if same tender is extended.

**8. Replace the existing provision of 4.2 C (4) with following**

The bidder should have completed at least one work of creation and deployment of Email server and network setup or Active Directory or LDAP Creation or DHCP Services in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprises, in last 5 years prior to last date of bid submission

Purchase orders or Project completion or Installation certificate from Client(s) of the referred projects shall be submitted.

**9. Replace the existing provision of 4.2 C (5) with following**

The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services or Help Desk System in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprises, in last 5 years prior to last date of bid submission.

Purchase orders/Project completion/ Installation certificate from Client(s) of the referred projects shall be submitted.

**10. Replace the existing provision of 4.2 C (6) with following**

The Bidder must have a valid quality certification of atleast ISO 9001:2008 and atleast ISO 27001:2013.

### Section 5, Evaluation Criteria

#### 11. Replace the existing provision of 4.2 B with following

##### B. Bidder's Experience

	<b>Citation Details</b>	<b>Documentary Evidence</b>	<b>Marks Allotted</b>
1.	<p>The Bidder should have experience in successful implementations of IT Infrastructure involving servers, storage, backup solution, Network components &amp; software or IT Network Infrastructure Solution with Active and /or Passive network component and is in operation. The bidder should have completed At least One work of the value not less than INR 4 Crore.</p> <p style="text-align: center;">OR</p> <p>At least two work of the value not less than INR 3 Crore in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprises in last 5 years prior to last date of bid submission.</p> <p>25 marks per citation up to 4 works for maximum of 100 marks 10 additional marks per workup to 2 citations for maximum of 20 marks if one of the above work is in Railways or Metro or Airport.</p>	Purchase orders or Project completion certificate(s) from Client(s) of the referred projects	100  20
2	<p>The bidder should have completed at least one work of providing Facility Management services or Maintenance Support in a multi-year contract of value not less than INR 50 Lacs, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprises, in last 5 years prior to last date of bid submission</p> <p>25 marks per work upto 3 works for maximum of 75marks</p>	Purchase orders or project completion certificate from Client(s) of the referred projects	75
3	<p>The bidder should have completed at least one work of creation and deployment of Email server and network setup or Active Directory or LDAP Creation or DHCP Services, in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprises, in last 5 years prior to last date of bid submission. 25 marks per works upto 4 works for maximum of 100 marks</p>	Purchase orders or project completion certificate from Client(s) of the referred projects	100

	<b>Citation Details</b>	<b>Documentary Evidence</b>	<b>Marks Allotted</b>
4	The bidder should have completed at least one work of Network management services (NMS) or Infrastructure Management Services or Help Desk System in organizations of Indian Central Govt. or State Govt. or PSU or global Railways or Metro Rail or Airport or Large Enterprise, in last 5 years prior to last date of bid submission  25 marks per work upto 3 works for maximum of 75 marks	Purchase orders or project completion certificate from Client(s) of the referred projects	75
5	The Bidder must have a valid quality certification of atleast ISO 9001:2008 and ISO 27001:2013.  25 marks for each certificate	Valid copies of certificate.	50

**12. Replace the existing provision of 4.2 C (1)(2) with following**

#	<b>Citation</b>	<b>Areas to be Demonstrated</b>	<b>Documentary Evidence</b>	<b>Marks Allotted</b>
1	Solution/ Product architecture	2. Whether the proposed Network Architecture is resilient, uses new technologies, is deployed and operational in existing projects of value 3 crores or more, and more than 500 nodes	Proposal	40

**13. Replace the existing provision of Stage II Financial Evaluation point 2 with following**

**Deleted .**

**14. Replace the existing provision of Stage II Financial Evaluation point 3 with following**

The normalized commercial score of the technically qualified bidders will be calculated, while considering the commercial quote given by each of the bidders in the commercial bid as follows:

**Normalized Commercial Score of a bidder= {lowest discounted quote/ bidders discounted quote} X1000 (adjusted to 2 decimals)**

The discounted quote is the net present value (NPV) of total cash out flow for NMRCL for Three (03) years discounted at 9%.

## Section 6, Scope of Work

### 15. Replace the provision of Section 6 with following

Modified Section 6 Scope of Work enclosed as Annexure I

## Section 7, Condition of Contract

### 16. Replace the provision of Clause 7.2 with following

The proposed payment schedule has been determined based on specific milestones, their achievement, deployment of resources, and cash-flow for procurement of hardware, software licenses, and other expenses on the project. All payments will be made within 30 days of submission of specific invoices along with supporting signed documents by NMRCL. In case there is a dispute on any line item in the invoice, NMRCL shall withhold the disputed amount and pay the rest of the monies due to the Bidder/Agency.

SN	Description	Payment
<b>A</b>	<b>For CAPEX</b>	
1.	Signing of contract	10% of the total cost of the CAPEX (Part A) against Bank Guarantee.
2.	Design and Architecture diagram to include Hardware, Software & licenses required, Network topology, configuration & implementation IT network between NMRCL locations.	5% of Total cost of the CAPEX(Part A)
3.	Procurement of Server, Storage, and Network Hardware and licenses for all the software solutions required	a. 60% on supply, b. 15% on installation, testing & commissioning. c. 10% after 90 days of successful commissioning.
<b>B</b>	<b>OPEX</b>	
4.	Recurring payments for Facility Management services	Bills will be raised by the bidder at the beginning of every quarter after adjusting penalties if any for non-compliance of SLA and shall be paid within 30 days.
5.	AMC payments and other license payments to OEM or reseller of hardware, software licenses if any	On receipt of invoices from the vendors, after verification, the bidder shall submit the same to NMRCL for payments within 30 days.

Payment terms are 30 days net. NMRCL may withhold disputed amounts if any and release

the balance payments. All payments will be subject to taxes and levies as applicable and invoices should clearly mark these separately. Payments may be subject to withholding tax, TDS and other statutory compliances as defined by the government from time to time.

All the milestone payments that are due to Bidder after requisite approvals/acceptance as prescribed shall be made to Bidder within 30 working days after receipt of valid invoice in this regard from the Bidder, subject to correctness and validation of invoices and no objections/observations by NMRCL.

If the contract is terminated due to default of the Bidder, the advance would be deemed as interest bearing advance at an interest rate of 9 percent per annum to be compounded quarterly.

Unless otherwise mentioned in this RFP for any component, payment terms for additional work assigned through change management shall be defined in the change management order which will be, to the extent applicable, in line with payment terms defined in the above table.

**17. Replace the provision of Clause 7.3 with following**

- a. 10% advance amount of accepted CAPEX contract value (as per clause 7.2 above) shall be paid to successful bidders on submission of performance bank guarantee issued from scheduled commercial bank having business office in India.
- b. Deleted
- c. Deleted
- d. Deleted

**18. Replace the provision of Clause 7.4 with following**

The successful bidder shall at his own expense deposit with NMRCL, within twenty eight days(28) from the date of issuance of PO, an unconditional and irrevocable Performance Bank Guarantee (PBG) from a scheduled commercial bank, in the format prescribed in Section 8, payable on demand, for the due performance and fulfilment of the contract by the bidder.

This Performance Bank Guarantee will be for an amount equivalent to 10 percent of total contract value. It is the intent of NMRCL that the PBG equivalent to 5 percent of total contract value is returned to the bidder after six months of Project Go-Live. Thus, the bidder needs to submit two PBG's, each equal to 5 percent of value of contract. The validity of one PBG will be up to 6 months after the Project Go-Live and second PBG shall be up to 6 months after the contract end date respectively. One PBG will be returned to the bidder six months after project Go-Live .

PBG shall be invoked by NMRCL in the event the Bidder/Agency:

1. Fails to perform the responsibilities and obligations as set out in the RFP to the complete satisfaction of NMRCL including failure to comply with exit management responsibilities.
2. Misrepresentations of facts/information submitted to NMRCL.

The PBG may be discharged / returned by NMRCL upon being satisfied that there has been due performance of the obligations of the bidder under the contract. However, no interest shall be payable on the performance bank guarantee. In the event of the bidder being unable to service the contract for whatever reason, NMRCL would invoke the PBG. Notwithstanding and without prejudice to any rights whatsoever of NMRCL under the contract in the matter, the proceeds of the PBG shall be payable to NMRCL as compensation for any loss resulting from the bidder’s failure to perform/comply its obligations under the contract. NMRCL shall notify the bidder in writing of the exercise of its right to receive such compensation within 40 days, indicating the contractual obligation(s) for which the bidder is in default. The bidder will have the opportunity to cure the deficit in service or breach in the service level to the satisfaction of NMRCL.

NMRCL shall also be entitled to make recoveries from the bidder’s bills, performance bank guarantee, or from any other amount due to him, an equivalent value of any payment made to him due to inadvertence, error, collusion, misconstruction or misstatement. On satisfactory performance and completion of the order in all respects and duly certified to this effect by the Project Coordinator, Contract Completion Certificate will be issued and the first PBG will be returned to the bidder.

**Section 8, Bidding and Contract Forms**

**19. Replace the provision of Form B7 with following**

**Affidavit**

**(To be typed on Non Judicial Stamped of appropriate value & notarized by Notary Public)**

This affidavit is executed at (Place) \_\_\_\_\_ on \_\_\_\_\_ (Date) by \_\_\_\_\_ (Name of the authorized person) behalf of \_\_\_\_\_ (name of the bidding firm), who is bidding for the work \_\_\_\_\_ (Name of the work), vide tender No \_\_\_\_\_ invited by Nagpur Metro Rail Corporation Limited

I/We hereby declare that:-

The bidders \_\_\_\_\_ (Name of the bidding firm) have not been banned or blacklisted by any Central / State government department or public sector undertaking of Govt. Of India of any State Govt. of Indian Union or Private sector/ Statutory Authority/World Bank during last 5 years as on the date of Bid submission.

I undertake that the above statement made by me is true & nothing has been concealed. I am aware that my candidature for the above bid shall be terminated by Nagpur Metro Rail Corporation Limited at any stage of bidding or even after award of the work or during the execution stage of the above work. (In case of successful bidder), if the above statement is found false or fabricated.

.....  
(Signature of the executant)  
(Name, designation and address of the executant)

Common seal of bidding firm..... has been affixed

.....  
Signature and stamp of Notary of the place of execution

**20. Add the provision of Form B9 with following**

**Form B9: Bank Guarantee for Earnest Money Deposit**

\_\_\_\_\_

**Beneficiary:** \_\_\_\_\_

**Invitation for Bids No:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**BID GUARANTEE No.:** \_\_\_\_\_

**Guarantor:** \_\_\_\_\_

We have been informed that \_\_\_\_\_ (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its bid (hereinafter called "the Bid") for the execution of \_\_\_\_\_ under Invitation for Bids No. \_\_\_\_\_ ("the IFB").

Furthermore, we understand that, according to the Beneficiary’s conditions, bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of \_\_\_\_\_ (\_\_\_\_\_) upon receipt by us of the Beneficiary’s first demand, supported by the Beneficiary’s statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- a) has withdrawn its Bid during the period of bid validity set forth in the Applicant’s Letter of Bid (“the Bid Validity Period”), or any extension thereto provided by the Applicant; or
- b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the performance security,, in accordance with the Instructions to Bidders (“ITB”) of the Beneficiary’s bidding document.

This guarantee will expire: (a) if the Applicant is the successful bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the performance security issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary’s notification to the Applicant of the results of the bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

\_\_\_\_\_  
*[signature(s)]*

21. **Replace the provision of Form C1 with following**

**Form-C-1  
 Notification of Award**

**Letter of Acceptance**

[Letterhead paper of the Employer NMRCL]

[Date]

To: [name and address of the Contractor]

This is to notify you that your Bid dated [date] for execution of the [name of the Contract and identification number, as given in the Contract Data] for the Accepted Contract Amount [amount in numbers and words] [name of currency], as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by NMRCL.

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You are requested to furnish the Performance Security @ 10% (5%+5%) of awarded cost within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section 8 – Bidding & Contract Forms, of the Bidding Documents

Authorized Signature:

Name and Title of Signatory:

Name of institution:

**Attachment: Contract Agreement****22. Replace the provision of Form C4 with following**

Deleted

**Section 10, Financial Bid****23. Replace the provision of 10.2 with following****10.2 Details of Cost Components**

Please add rows to ensure that line item wise details of each set of components are available in this sheet. Unit costing of equipment may be attached separately

**Note: -**

1. No column should be left blank.
2. All rates to be quoted by the bidder in Indian National Rupees.
3. All rates to be quoted bidder shall be inclusive of all statutory taxes, including LBT, duties except service taxes as applicable prior to last date stipulated for submission of Bid. Rate also includes all direct and indirect taxes.



4. Service Tax (as applicable) at time of billing shall be reimbursed by NMRCL to successful bidders on production of proof of payment of Service Taxes.

S. No	Item description	Name of Tax	Rate of Tax	Year1			Year 2			Year 3			Year 4			Year 5			Year 6			Total Cost		
				Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total	Base Cost	Applicable Taxes	Total
A	1A	Design engineering																						
	2A	Supply of COTS Solutions, Software & Licenses																						
	3A	Supply of hardware, and networking, LDAP/AD, , etc.																						
	4A	Installation, Testing & Commissioning of hardware , COTS Solutions, Software & Licenses																						
	5A	Anything else required to comply the requirement																						
B	1B	Recurring Annual Maintenance Charges for hardware																						
	2B	Recurring Charges for Manpower for FM and other activities																						
	3B	Recurring Annual Maintenance Charges for																						

		software & license																								
	4B	Anything else required to comply the OPEX																								
Total Cost (A+B)		Year wise cost																								
<b>Total In Figures &amp; in words</b>																										

24. **Replace the provision of 10.3 with following****10.3 Minimum Bill of Material****10.3.1 Network Equipment**

The network equipment specified below is indicative, the bidder has the option to choose alternative technology solutions with similar features and capabilities as long as the entire solution delivers the requisite connectivity across the locations. The detailed technical specification sheet attached below. Wireless network across all locations need to work seamlessly for any user moving from one location to another without having to reselect the network name or re-authenticate using passwords or any other mechanism.. Apart from the minimum quantities mentioned herein, the bidder shall provide prices for unit quantities for future purchases as required. The final BoQ shall be derived after approved detailed design, during the detailed design if it is identified that any of the following line items or quantity is not required the negative variance shall be applied on total bid cost.

SL No.	Description	Unit	Quantity	Unit price in INR	Total Price In INR
1	UTM	No.	02		
2	Core Switch	No.	02		
3	L-2 Switch	No.	15		
4	Access Point	No.	35		
5	Wireless Controller	No.	02		
6	Office printer	No.	10		
7	CAT 6e Cable LSFRZH	Meters	22500		
8	Network rack 42 U	No.	2		
9	Network rack 24 U	No.	12		
10	Network rack 12 U	No.	12		
11	ODF – Equipment room side 24 port- and accessories	No	04		
12	ODF – Field Side – 6 port and accessories	No	26		
13	6 Core Single Mode Fiber – Armoured – LSZH	meters	2000		
14	Patch Panel/Jack Panel -24 Port	No.	15		
15	Factory made Patch cords (Cat.6e, S/FTP, 4P, LSFRZH, RJ45/s-RJ45/s, 1 meter)	No.	150		
16	Factory made Patch cords (Cat.6e, S/FTP, 4P, LSFRZH, RJ45/s-RJ45/s, 2 meter)	No.	450		
17	I/O outlets (CAT 6e STP Compatible for structural cabling standards )	No.	450		
18	Items to meet structural cabling requirement	LS	LS		
19	Cable trays / secondary cable containment at Metro Bhawan	LS	LS		

20	Video Conferencing Equipment with accessories	No.	04		
21	Active Directory Server: Intel Xeon E5-2697 v4 2.3GHz,45M Cache, 9.60GT/s QPI, Turbo, HT, 18C/36T (145W) Max Mem 2400MHz or better	No.	01		
22	Email Server: Intel Xeon E5-2697 v4 2.3GHz,45M Cache, 9.60GT/s QPI, Turbo, HT, 18C/36T (145W) Max Mem 2400MHz or better	No.	01		
23	Storage for redundancy	No.	01		
24	Helpdesk MMI	No.	02		
25	NMS	No.	01		
26	NAC Software 50 IP nodes, 250 Wireless AP and scalable to double the current capacity	No.	01		
27	Required Software with License	No.	As per design		
28	Backup Management Software	No.	01		
29	Any other Item required to comply the Contract	LS			
30	AD Management Software	No.	01		
31	Asset & Patch Management Software	No.	01		
32	Any other item to meet specification or design requirement.				

**10.3.2 Servers and storage**

Bidder to list the equipment type with specifications and unit price below. Please add rows as appropriate under each header if more than one type of equipment/license is being proposed. Licenses for virtualization, creating AD services, Network Management, File & Print services, Anti-virus solutions, Helpdesk software, and others as required to complete the solution.

No.	Type	Unit	Qty	Unit price in INR	Total Price In INR
1.	Server (Active directory, Email server)	No.	As per design		
2.	Storage	No.	As per design		
3.	Office Printers	No.	12 no.		
4.	Licenses	No.	As per design		

5.	Antivirus and Patch Management	No.	As per design		
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**10.3.3 Manpower**

Contractor to deploy sufficient number experienced technical staff to meet SLA requirement and bidder needs to quote according to dates as provided. The Tentative access dates for metro Bhavan & reach wise date for providing FMS services has been provided phase-wise. The deployment plan shall be given reach-wise and year-wise Following is minimum number (not exhaustive)

- (1) Server Administrator - he will act as Site in charge, coordinate activities with team
- (2) Mail Administrator – overall management and maintenance of of mail service at NMRCL
- (3) Network Engineer - Monitoring & troubleshooting of LAN/WAN equipment
- (4) Desktop Engineer - Handling and maintaining all network & IT equipment
- (5) Site Support Engineer - he shall look after Desktop and other peripherals when there is no call for site support.
- (6) Helpdesk personnel. – should log user calls when necessary, tracking each call etc. troubleshooting of Backup server(at DAKC, Navi Mumbai) is inclusive in present scope of work.

**10.3.3.1 Deployment Plan :**

Description	Metro Bhawan	Reach -1	Reach -2	Reach -3	Reach -4
Server Administrator & Site In-charge	Minimum 1 person				
	From Go live(D) Till End of Contract				
Mail Administrator	Minimum 1 person				
	From Go live(D) Till End of Contract				
Network Engineer	Minimum 1 person in 2 shift	Minimum 1 person in 2 shift		Minimum 1 person in 2 shift	
	From Go Live(D) Till End of Contract	From Taking over from N1TL01 Till End of Contract		From Taking over from N1TL01 Till End of Contract	
Site Support Engineer/ Onsite support personnel	Minimum 3 person in 1 shift	Minimum 1 person in 3 shift	Minimum 1 person in 3 shift	Minimum 1 person in 3 shift	Minimum 1 person in 3 shift
	From Go Live(D) till End of Contract	From Taking over from N1TL01 Till End of Contract	From Taking over from N1TL01 Till End of Contract	From Taking over from N1TL01 Till End of Contract	From Taking over from N1TL01 Till End of Contract
Helpdesk personnel	Minimum 1 person in 3 shift				
	From Go Live(D) till End of Contract				
Desktop Engineer	Minimum 1 person	Minimum 1 person		Minimum 1 person	

Description	Metro Bhawan	Reach -1	Reach -2	Reach -3	Reach -4
	From Go Live(D) till End of Contract	From Taking over from N1TL01 Till End of Contract		From Taking over from N1TL01 Till End of Contract	

Above deployment plan is with minimum man power whereas contractor may deploy team in order to achieve SLA mentioned in relevant clauses.

10.3.3.2: Bidder shall consider minimum Man-month requirement, however he may quote more manpower if required to comply the SLA requirement specified in the tender

S. No.	Manpower Type	Unit	Minimum Quantity	Unit price in INR	Total Price In INR
1	Server Administrator	Man months	36		
2	Mail Administrator	Man months	36		
3	Network Engineer	Man months	170		
4	Desktop/IT Engineer	Man months	85		
5	Site Support Engineer	Man months	290		
6	Helpdesk personnel	Man months	108		
8	Any Other manpower to comply the Contract	Man months	LS		

Contractor shall submit deployment plan to NMRCL for approval before deployment of staff, deployment plan will be approved separately for Metro Bhawan/offices & each reach. Payment will be made based on actual deployment of staff & SLA achieved.

**NAGPUR METRO RAIL PROJECT**

**ANNEXURE I TO ADDENDUM/CORRIGENDUM**

**FOR**

**SUPPLY, DESIGN & COMMISSIONING OF IT NETWORK, IT  
INFRASTRUCTURE AND PROVISION OF FACILITY MANAGEMENT  
SERVICES**

**TENDER NO.**

**N1IT-03/2016**

**DECEMBER-2016**



## SECTION- 6

### SCOPE OF WORK

#### **6.1 GENERAL:**

NMRCL has its main office located in Metro House, Anand Nagar, Civil Lines, Nagpur-440001. NMRCL desires to award work of **Supply Design & Commissioning of IT Network, IT Infrastructure and provision of Facility Management services** at Nagpur Metro Railway Corporation Limited offices.

Scope of work shall be consisting of Supply / Design / Installation / Commissioning and Maintenance of Hardware items like Servers / Storage / VC / Passive Networking / Active Switching / Firewall / UTM / required COTS Software and Services not limiting to

- a) Facility Management
- b) Help desk Services
- c) Technical Support Service
- d) Remote Site support
- e) NMS Management & Admin
- f) Virtualization Management & Admin
- g) Firewall Management Admin
- h) IPS Management & Admin
- i) OS Management and OS Administration
- j) Backup and Restoration Management
- k) IT Security Management
- l) Network Management Service (LAN / WAN)
- m) Vendor Coordination
- n) Mail management

#### **6.2 UNDERLYING STRATEGY**

1. NMRCL has 5 office premises situated in Nagpur city with approximately 250 users; another office complex is being constructed. The new premises will have capacity to house about 500 personnel. The Bidder will create the LAN, Wireless and Video Conferencing at these premises. All offices already have LAN except upcoming Metro Bhavan Building. Drawings for the office layout shall be shared with bidders to estimate material, work and equipment required. The total number of users at NMRCL may be taken at 1100 for various calculations in this document. The year wise users for NMRCL

Year 1	Year 2	Year 3
750	900	1100

Primary AD server and Email server shall be installed, commissioned and maintained at space allocated in data center, DAKC, Navi Mumbai. The space allocation for

equipment (rack space, Monitor space) shall be NMRCL whereas installation of hardware and necessary cabling shall be done by Contractor to install, configure and integrate servers with the provided MPLS network. Contractor shall facilitate NMRCL for liaisoning.

2. Backup server shall be installed, commissioned and maintained at equipment room of Metro Bhavan. Contractor shall be responsible for submit design accordingly.
3. The office building(s), Interchange Station, and Depot will connect to the Data Center via MPLS network in a way that there is an alternate network route available with no single point of failure. LAN Connectivity for Stations, Depots, RSS and OCC/BOCC shall be executed by N1TL01 Contractor. Each of the remaining 37 stations will also connect to the Interchange Station and the Depot through a dedicated available NMRCL network. Each station is expected to have an estimate of 10 users each.
4. Nagpur Metro has the locations mentioned in 6.9 below, where the IT services & Facility management services has to be designed, planned, created, and maintained. IT Infrastructure to be provided at locations other than OCC / BCC / Stations / Interchange Stations / Depots & RSS. The components include Active and Passive network components, connectivity within the premises and to the primary network that links to the Data Center. The bidder is required to submit a network architecture diagram defining the network topology, active and other passive components like switches, hubs, access points, etc. cabling requirements at each location and requirements at each location, e.g. enclosed area for installing a network rack, conduits for laying the cables, cooling requirements for the equipment etc.
5. OA&IT Network with OFC, Switches, LAN Ports, Patch Panels, and Termination Points at Work Stations at OCC / BCC / Stations / Interchange Stations / Depots & RSS shall be implemented by N1TL01 for operation, maintenance staff of Nagpur Metro.

Whereas CPM / Site Offices, Metro House, SBI Building office are connected to IT network through MPLS network.

N1IT-03 Contractor shall take over existing network implemented by N1TL-01 and also responsible for network setup in Metro Bhavan. Moreover, Contractor shall also be responsible for interface with N1TL-01.

Implementation of IT Network at Metro Bhavan is in scope of N1IT03 Contractor  
N1IT03 Contractor shall also be responsible for interface & integration of all NMRCL location and perform FMS for same

6. Router/Gateways for MPLS shall be provided by NMRCL whereas the contractor shall be responsible to make necessary interfaces and configuration to establish Network with the router, gateways, MPLS network

**The scope includes maintenance of LAN nodes covering manpower support, spares & services. During the contract period all necessary spares are to be supplied and installed by the contractor.**

### **6.3 WORK DESCRIPTION**

1. Create and deploy the Network Architecture and strategy across all locations using appropriate technologies for connectivity with cost optimized resilience. It is bidder's responsibility to upgrade and integrate the existing LANs if any required. The shortlisted bidder shall survey and submit the BOM for upgrade activity of LAN, unit price of which shall be taken from the BOQ. The Contractor shall interface with N1TL01 -Telecom Contractor for taking over of existing LAN Network being deployed at OCC, BCC, Depots, Interchange Station and stations. Supply and install Network devices including Layer 2/3 switches, Wi-Fi access points, data cabling, patch cord, intelligent patch/Jack panel, as per the given technical specifications, at the Data Center, offices, and other locations, excluding OCC / BCC / Stations / Interchange Stations / Depots & RSS.
2. NMRCL shall procure and deploy the MPLS links and Internet bandwidth across all locations directly from the link providers/ ISPs. However the bidder shall manage the links across the locations.
3. The link capacities For clarity/estimation& provision, specification of links below may be referred, all the links are MPLS unless otherwise specified- Metro House 16 mbps, Udhyog bhavan 16 mbps, Metro Bhavan 45 Mbps, Data Centre 100 Mbps, interchange station 8 Mbps, Depots 8 Mbps, CPM offices 4 Mbps.
4. Deployment and Management of Firewall in redundant mode at the data center to integrate the internal telecom network of NMRCL as per specifications given in Section 6.7.
5. VPN services to support concurrency of 150 users, expandable to 250 users when required in stages. VPN shall terminate at DC only for Laptops and Tablet that will be used outside of office premises.
6. Videoconferencing services to be provisioned at all the offices (currently 3 offices will require 1 VC in conference room each and the Head office shall have 2)as per specifications given in section 6.7
7. The bidder shall create and manage the IT infrastructure at the new premises, along with interface and incorporate infrastructure being deployed by N1TL01. The Bidder shall provide IT services and Facilities Management services including the following to NMRCL at all locations specified in this RFP in section 6.8.
8. Consult and manage the procurement of laptops, desktops, tablet computers, OS, COTS software and smartphones as required. Bidder to advice on appropriate configuration of devices to be procured and obtain quotes based on which approved devices may be procured by NMRCL.
9. Procure, deploy and maintain personal, network, and WIFI Printers at NMRCL premises. Consumables will be managed by the bidder and reimbursed at actual cost by NMRCL.

10. Desk side support for end-user compute devices like Desktop, laptop, all-in-one, tablet computers, and specified mobile phones for resolving problems related to connectivity and performance.
11. Provide operational support to the COTS software packages that NMRCL has decided to deploy. The scope is to ensure that the licensed software components are installed on the devices identified and that they are functional in all aspects. Solutions would include but not limited to Office productivity tools like MS Office etc. In case there are any functionality support or changes required to solutions which require creation of additional custom software or debugging of solutions like ERP or 5D BIM, the bidder shall log the call and route to the respective agencies for resolution.
12. Procure, deploy and manage Help desk software to log calls from users and provide SLA based attendance and resolution to calls. Where the call may pertain to other third parties (specifically application providers/ ISPs), they may be logged into the system and then routed to the respective agency/ person for them to provide the support. In all cases the closure of the call has to be monitored by the Help desk and escalate non resolution of third party vendors. Bidder will thus act as an aggregation point for all support calls that any user(s) may log for hardware, software, networking, or new requests for IT equipment or services. Specification of the Helpdesk software provided in section 6.7.
13. Procure, deploy and manage requisite Hardware and Software for creating Active Directory/LDAP, proxy server, E-mail server, DHCP for NMRCL to allow the users access to resources based on roles, privileges, and responsibilities defined and maintained. Creation, modification of user privileges and rights, suspension of users, password resets, and archiving of users will be managed by the Bidder. The Bidder shall also coordinate with the software vendors to provide authentication to applications through the AD. Architecture should allow domain authentication even in case of network failure. Specifications provided in section 6.7. Total no of users 1100.
14. Procure and deploy requisite Hardware to provide File & Print services to NMRCL users at all locations. Servers preferably virtualized and storage for such purposes may be deployed at NMRCL premises or the NMRCL third party Data center. Please note that NMRCL has taken a strategic decision to collocate the data center with a third party commercial Data Center provider. The Bidder to deploy the necessary equipment at the Data Center (DAKC). Network racks where required at office premises needs to be incorporated in the solution and bidder shall quote for that. In case there is a need for servers or storage to be deployed at NMRCL premises, they may be accommodated in the same network distribution rack. All consumables will be provided by NMRCL and managed by the bidder. Specification provided in section 6.7
15. Procure, deploy and maintain an effective centralized client server anti-virus solution for desktops, laptops, and other end user compute devices, totaling 1100 users, as per specifications given in Section 6.7
16. The bidder shall provide appropriate infrastructure setup including Hardware and tape based backup solution for Bidder provided services. As per specifications given in section 6.7. All consumables will be provided by NMRCL and managed by the bidder.
17. Basic level of security is expected to be deployed for all Bidder provided infrastructure

with policies to govern their maintenance and support. Bidder may follow ISO 27001 defined standards for such deployment.

18. Bidder will monitor and report any attempts to breach the security or exception conditions that may occur during the regular course of business. Remediation, patches, updates as required shall be executed by the Bidder.
19. Operating System upgrades and patches, anti-virus patches and updates to end-user compute devices shall be done by the Bidder to ensure that they stay current to whatever extent required without compromising the device in a way to address vulnerabilities or breaking required functionality and inter-operability with other solutions. Patch Management specification is given in Section 6.7. Renewal/ Up gradation of such software and subscription shall be done by NMRCL as suggested by the bidder.
20. Procure, Deploy and manage Asset Management Software for tagging and managing IT assets of NMRCL. Specifications provided in section 6.7.

Bidder shall create and keep updated documentation for all the services provisioned under this SCOPE OF WORK.

#### **6.4 FACILITIES MANAGEMENT (FM) & IT SERVICES**

The purpose of FM is to take care of and provide services to all the users (employees, contractors, consultants, third parties approved by NMRCL) within NMRCL premises or via the Internet using VPN services, who use NMRCL provided or approved assets for access to network, COTS software, applications, peripherals like Printers, scanners, wireless network, and Internet. The activities to be carried out under **FM Shall be responsible of :**

1. The bidder shall be responsible for procurement consultancy, configuration and installation of compute devices along with accessories if any, and peripherals, licensed COTS software, and tag the asset for management. Bidder to ensure warranties/AMCs are procured for all the hardware components as per the BOQ, for entire duration of the project. For software components support from OEM to be obtained for all components for entire duration of the project.
2. The IMAC process for all IT components on the locations specified under 6.8, except the data center shall be the responsibility of the Bidder.
3. For all identified users internal or external, create, modify, retire, suspend, archive, and delete user ids with roles, responsibilities, privileges for access to network, applications, internet and other resources.
4. Procure, install and sustain an ITIL compliant Helpdesk/NMS solution for logging requests for help for all IT assets and applications. The system shall log all calls received via phone, email, in person, or through the self-service portal.
5. Development of standard operating procedures with call prioritization guidelines, problem security codes and escalation procedures etc. in consultation with NMRCL
6. Route calls to respective providers for response and resolution. Track performance against SLA and report exception conditions if any.

7. Provide desk side and remote support to IT users of NMRCL assets or applications, internal or external, to assist them in effective usage.
8. Coordinate with OEMs for spares, repairs, replacements for malfunctioning equipment and stock critical spares and/or full assembly and/or spare machines onsite to meet SLA for the IT equipment as per the BOQ of this tender.
9. Create and provide analysis of calls received versus service level agreements, repeat calls, root cause analysis of critical breakdowns
10. Communicate planned outages and restoration to impacted users well in advance and coordinate with agencies as appropriate to keep disruptions to a minimum. Communicate unplanned outages and restoration of services and hardware.
11. Monitor and mediate services with automation and tools for anti-virus updates, operating system patches, firewall, VPN services, personal firewall if enabled, software updates as required for users for applications in conjunction with the application service provider.
12. Monitor and provision compute and storage as required for File & Print, LDAP, and other services as defined in this RFP. The primary office location will have local file and print server which should be able to work even when the WAN network is down.
13. Backup and restoration of files from tape library to respective server/user as required
14. Services rendered under this RFP are expected to follow ITSM standards as per ITIL Foundation though certification is not mandated.
15. Bidders should prepare and submit along with their technical proposal, details of methodologies and computations for sizing and capacity of storage, computer, switches, backup, tape libraries, sizing of security appliances and their compute requirements. The technical evaluation of responses shall analyze the computations for viability.
16. Facilities Management Team – Roles & Responsibilities

**Server Administrator & Site In-charge** – Should have good knowledge and work experience on Windows /LINUX/Client-Server mode/Virtualization. He being the project manager, also should be capable of interaction with the customer and vendor and coordinate activities within the team. He should also be capable of monitoring all the remote sites connectivity through either Leased Line /MPLS WAN. He shall also be capable to monitor all the remote IP based equipment either PC, SERVER, ROUTER, SWITCH, NETWORK PRINTER or any other network equipment through the monitoring tools. He should also have sufficient knowledge of running Network Monitoring Tool & working experience of more than 2 years. He should also be responsible for Generating call reports, analyzing the call statistics, all failure case studies, all Change case studies, and all Configuration case studies. For any sort of new installation or migration, the server administrator should be fully responsible for all sorts of installation of OS (Windows/Linux)

The Server Administrator should work in co-ordination with DBA administrator. He should be capable of managing total IT infrastructure at NMRCL.

**Mail Administrator-** The Mail Administrator should be responsible for overall management and maintenance of Mail Service at NMRCL. It includes Mail (Send Mail, Squirrel Mail etc.), Proxy (Squid) etc. The Mail Administrator should also be responsible or keeping back-up of all mail data and should also be capable of retrieving the same at the hour of need.

**Network Engineer** – Capable of monitoring & troubleshooting of LAN/WAN equipment's (Active & Passive components). Should have hands on experience on routers & switches and monitoring the same using NMS. Engineer must have basic knowledge in managing IT infrastructure. He should also have CCNA certificate. . The engineer shall monitor all the remote sites connectivity through either Leased Line /MPLS WAN. He shall be responsible to monitor all the remote IP based equipment either PC, SERVER, ROUTER, SWITCH, NETWORK PRINTER or any other network equipment through the monitoring tools. He should also have sufficient knowledge of running Network Monitoring Tool.

**Site Support Engineer** – Should handle all calls related to NMRCL .He Should be capable of diagnosing & troubleshooting hardware & OS related problems in PC's, Laptops & printers. He should have good knowledge of Windows (including installation & configuration) & other COTS software. The person should also be able to resolve problems through remote PC access mechanism.

**Helpdesk personnel** – Should log user calls when necessary. He will be responsible for assigning service category, tracking each call to resolution, escalating calls.

**Desktop Engineer** – Handling and Maintaining all the Network and IT Equipment in the respective locations.

It is the responsibility of the Contractor to ensure smooth running of the machines along with its installed software (preloaded & system).

## **17. Bandwidth & Network Management tools**

Requirement is for both Monitoring tool & diagnosis tool ie., a total Management tool. For this vendor shall have to install a licensed NMS for monitoring LAN & WAN facilities. The supply, installation & implementation of the tool shall be under vendor's scope. The NMS should have some standard /bench marking.

## **6.5 NETWORK MANAGEMENT**

The bidder shall help create and deploy the Network Architecture across all locations using appropriate technologies for connectivity like MPLS, P2P leased lines, FSO, Metro Ethernet, Wireless, or other connectivity mediums with cost optimized resilience. Some of the salient tasks are:

1. Network Architecture across all the locations with no single point of failure
2. Identification, sourcing, installation, configuration, and comprehensive maintenance of active network devices including switches, bridges, WIFI access points, modems for which the tentative bill of material is given in Section 10 and their respective specifications are given in section 6.7
3. Planning, procurement, installation, and comprehensive maintenance of Cat 6/6E cabling,

- patch cords and intelligent patch/jack panels.
4. Active monitoring of the network for network usage, planned and unplanned outages creating resilience to minimize the impact on business.
  5. Coordinate and manage OEMs and primary network service providers for SLA management.

## **6.6 CALL CLASSIFICATION**

Calls will be classified based on components and impact to the ability to work for individual or collection of users. Response time and resolution times are thus linked to the severity of impact.

### **1. Service Level Objectives –**

90% of the calls will be closed within the stipulated resolution time (depending on the Severity of the call) - Measured on a quarterly basis.

The problems will be classified into 3 severity levels –

Severity Level – 1 – A problem which affects large number of users / critical users in their immediate working (e.g. – Network, server, network printer problems etc.)

Severity Level – 2 – A problem that affects an individual user (e.g. – Individual hardware problem, printing problem, problem in using OA tools etc.)

Severity Level – 3 – Installation of desktops, change in configuration, creation of profiles, movement of equipment, etc.

<b>Component affected</b>	<b>Severity Level 1</b>	<b>Severity Level 2</b>	<b>Severity Level 3</b>
Desktop, Laptop, Printer, Scanner	Any call of critical users, Network Printer problem, Problem in Laptop.	No Display, not able to boot, not able to login, keyboard, mouse not working, virus problem, local/network printing problems.	Hardware / Software installation & upgrades New COTS software Installation Moves, Adds, Changes (IMAC)
Server	Server not booting up, hardware failure cannot login to server, database has stopped, any problem related to Server Room		Server upgrades bug fixes, patch installations, preventive maintenance. Server/network response is slow.
Network	Switch, router, Hubs, link failures, Videoconferencing etc.		New Cable layout, change of Router



Software	OS problem on Server, OS corruption	Performance tuning / response time of system	New software installation
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## 2. Response / Resolution Matrix

Severity	Description	Response Time	Resolution Time (Max)	Benchmark
S1 – Critical Problems	A problem that affects entire process/ network or 80% of the users in a location	15 minutes	8 hrs.	98% of the cases
S2 – Major Problems	A problem that affects a typical user.	30 minutes	12 hrs.	98% of the cases
S3 – Minor Problem	A problem that affects the productivity of user / users Planned installations, movement, addition and changes to software and hardware inventory	90 minutes	By next business day	95% of the cases for single installation
			In rest of the cases, the planned activities shall be decided mutually.	

## 6.7 Technical Specification

### 1. Technical Specification of Core Switch

<b>Core Switch</b>		
<b>Preferred Make: Cisco / Extreme / juniper / HP/ Alcatel Lucent /Dell/Huawei</b>		
<b>Sr. No.</b>	<b>Generic Requirements</b>	<b>Compliance (Y/N)</b>
<b>1. Switch Architecture and Performance</b>		
	Switch should have minimum 1200 gbps of higher Switching capacity	
	Switch should be equipped with minimum 1 GHZ CPU , 1GB RAM and 4 GB Flash	
	Should support low latency mode to achieve 2 Micro second or less data transfer port to port and Layer 2 multipath to multiple Peer switches in a STP free architecture	
	Redundant PSU (both AC and DC supported) and Fan Tray. Should be hot swappable	
	Should support Open flow v1.0 or higher for SDN to ensure a Vendor neutral architecture	
	0°C to 45°C operating temperature and 10% to 90% relative humidity	
<b>2. Required Port Densities</b>		
	Switch should have minimum 42 x 1/10G SFP + / XFP fiber ports and 4 x 40G QSFP+ ports.	
	The two core switches should be deployed in a HA configuration with 4 x 40G links.	
<b>3. Layer 2 features</b>		
	802.1Q VLAN on all ports with support for 4000 concurrent VLANs.	
	Support for 128 K MAC addresses or better as per design requirement	
	Support for MSTP, PVST+ and RSTP	
	Should support Private VLAN , VLAN Aggregation and 802.1v or equivalent protocols	
	Must support Layer2 Ping and Layer 2 Internet Control Message Protocol (ICMP) packets for connectivity and Fault Management or equivalent standard protocol to achieve the functionality	
	Must support multicast protocols such as IGMP snooping and other applicable standards.	
	Should support SNMP and syslog Notification for MAC addition, deletion and movement across ports	
<b>4. Layer 3 features</b>		
	Support for IP Unicast routing protocols (static, RIPv2, OSPF) from day 1 and upgradeable to ISIS / BGP.	
	Multicast routing protocol with PIM-SM and upgradeable to PIM DM with license	
	Should support policy based routing in hardware	
<b>5. Quality of Service (QoS) Features</b>		
	Should support Diffserv –RFC 2474, RFC 2475 RFC 2597 and RFC 2598 or equivalent standards to achieve functionality. N1-IT03 shall take approval from NMRCL during the design stage before implementing QOS features .	
	Switch should support eight hardware queues per port.	

<b>6. Security Features</b>	
	Switch should be having Ingress ACL - 1024 or better which shall be scalable to achieve functionality requirement
	Should support Multitenancy for secure traffic isolation with Virtual Router/ Device context or equivalent that allows multiple instances of user created control plane to co-exist within the same switch & router at the same time without overlap, enabling sharing of virtual Router/ switch across business units as individual entity. Each Virtual Router / Device Content will be isolated entity and should not be able to talk to each other within the same box
	Should Support mechanism for detection of anomalous protocol behavior and auto triggering of executable preventive action within the switch. Should support Protocol based anomaly detection. If required necessary addon component for threat detection should be quoted
	Should support SSH and SFTP or equivalent protocols with encryption/authentication. It is to be ensured compatibility of file transfer capabilities with SSH server(s).
	Should support Serial RS232 port ,OOB ethernet management port and USB or External Compact Flash slot
	Support features / protocol to measure Latency between devices to pinpoint slow traffic paths
	Should support scheduled archiving / uploading of configuration and system log to a central server
	Switch should support ASIC based Flow monitoring like SFLOW/Netflow/IPFIX
	Should support ability to restart individual CPU process like SNMP,SFTP, SSH etc in case of process crash without the need to reboot the entire switch.
	Should support command customization & scripting with TCL or Python or Ruby
	Should be manageable by SSH,RMON, SNMP, XML and HTTP/s
<b>7.Data Center</b>	
	Should support SDN open stack Architecture for fast DC provisioning
	Should be able to associate policy profile in context to individual VM. Policies should automatically flow across the switches following the VM movement.
<b>8. Warranty and Certification</b>	
	Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot
	Switch should be compliant to following certifications and Safety Regulation : NEBS Level 3, UL 60950, EN 60825-1+A2:2001, CISPR 22: 2006 Ed 5.2, Class A (International Emissions), EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 61000-4-6:2005 Conducted Immunity,MEF9 and MEF14 or equivalent better standards to achieve functionality.
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

## 2. Technical Specification of Server Farm Switch

<b>Server Farm Switch</b>		
<b>Preferred Make: Cisco / Extreme / juniper / HP/ Alcatel Lucent / Dell/Huawei</b>		
<b>Sr. No.</b>	<b>Generic Requirements</b>	<b>Compliance (Y/N)</b>
<b>1. Switch Architecture and Performance</b>		
	Switch should have 264 gbps or better. Contractor shall submit design to NMRCL for approval	
	Switch should be equipped with minimum 1 GHZ CPU , 1GB RAM and 4 GB Flash	
	Should support low latency mode to achieve 2 Microsecond or less data transfer port to port and Layer 2 multipath to multiple Peer switches in a STP free architecture	
	Redundant PSU (both AC and DC supported) and FanTray. Should be hot swappable	
	Should support Openflow v1.0 or higher for SDN to ensure a Vendor neutral architecture	
	0°C to 45°C operating temperature and 10% to 90% relative humidity	
<b>2. Required Port Densities</b>		
	Switch should have minimum 48 x 1G/10G BaseT and 4 x 10G SFP + / XFP fiber ports. Scalable to support at least 2 x 40G in future	
<b>3. Layer 2 features</b>		
	802.1Q VLAN on all ports with support for 4000 concurrent VLANs, and 802.1AK or equivalent for dynamic VLAN propagation	
	Support for minimum 48K MAC addresses or better	
	Support for MSTP, PVST+ , RSTP	
	Should support Private VLAN, VLAN Aggregation, and 802.1v or equivalent protocols .	
	Must support Layer2 Ping and Layer 2 Internet Control Message Protocol (ICMP) packets for connectivity and Fault Management or equivalent standard protocol to achieve the functionality	
	Must support multicast protocols such as IGMP snooping and other applicable standards to achieve the functionality.	
	Should support snmp and syslog Notification for MAC addition, deletion and movement across ports	
<b>4. Layer 3 features</b>		
	Support for IP Unicast (static, RIPv2) or better routing protocols from day 1	
	Support MVR and upgradeable to Support PIM	
	Should support policy based routing in hardware	
<b>5. Quality of Service (QoS) Features</b>		
	Quality of Service (QoS) Features: Should support Diffserv –RFC 2474, RFC 2475 RFC 2597 and RFC 2598 or equivalent standards to achieve functionality. N1-IT03 shall take approval from NMRCL during the design stage before implementing QOS features.	
	Switch should support eight hardware queues per port.	
<b>6. Security Features</b>		
	Switch should be having Ingress ACL - 1024 or better which shall be scalable to achieve functionality requirement .	

	Should support Multitenancy for secure traffic isolation with Virtual Router/ Device context or equivalent that allows multiple instances of user created control plane to co-exist within the same switch & router at the same time without overlap, enabling sharing of virtual Router/ switch across business units as individual entity. Each Virtual Router / Device Context will be isolated entity and should not be able to talk to each other within the same box	
	Should Support mechanism for detection of anomalous protocol behaviour and auto triggering of executable preventive action within the switch. Should support Protocol based anomaly detection. If required necessary add-on component for threat detection should be quoted	
	Should support SSH and SFTP or equivalent protocols with encryption/authentication. It is to be ensured compatibility of file transfer capabilities with SSH server(s).	
<b>7. Management Features</b>		
	Should support Serial RS232 port ,OOB ethernet management port and USB or External Compact Flash slot	
	Support features / protocol to measure Latency between devices to pinpoint slow traffic paths	
	Should support scheduled archiving / uploading of configuration and system log to a central server	
	Switch should support ASIC based Flow monitoring like SFLOW/Netflow/IPFIX	
	Should support ability to restart individual CPU process like snmp , ssh , stp etc in case of process crash without the need to reboot the entire switch.	
	Should be manageable by SSH,RMON, SNMP, XML and HTTP/s	
<b>8. Warranty and Certification</b>		
	Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	
	Switch should be compliant to following certifications and Safety Regulation : NEBS Level 3, UL 60950, EN 60825-1+A2:2001, CISPR 22: 2006 Ed 5.2, Class A (International Emissions), EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A, IEC/EN 61000-4-6:2005 Conducted Immunity,MEF9 and MEF14 or equivalent better standards to achieve functionality .	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

### 3. Technical Specification of 24 Port Gigabyte Access Switch

<b>24 Port Gigabyte Access Switch - Preferred Make: Cisco / Extreme / juniper / HP/ Alcatel Lucent/ Dell/Huawei</b>		
<b>Sr. No.</b>	<b>Generic Requirements</b>	<b>Compliance (Y/N)</b>
<b>1. Interface requirements</b>		
	Minimum of 24 ports 10/100/1000 Base T and 4x 10G SFP+ ports	
	1 Console Port, USB Port / External Flash	
	Support stacking for minimum upto 4 switches with minimum 32 Gbps stacking with scalability to design and functional requirement.	

	Have Redundant Power Supply support and fan to adjust to varying weather conditions in campus	
<b>2. Design &amp; Performance</b>		
	Each switch should have minimum 128 Gbps or more with non-blocking architecture and Forwarding rate of 95 Mpps	
	Switch should be equipped with minimum 1 GHZ CPU , 1GB RAM and 4 GB Flash.	
	Should have LED indicator for per port status , FAN, PSU and Management Status	
	0°C to 45°C operating temperature and 10% to 90% relative humidity	
	Hardware and software configuration have for IPv6 from day one	
<b>3. Switching / Routing</b>		
	Should have 16 K MAC Address, 1 K active VLAN	
	Should support 10 K ARP entries	
	802.1D spanning Tree and PVST+, 802.1w, 802.1s , Should have BPDU Guard or equivalent feature on edge port to auto disable port for a configurable time period to if an accidental loop occurs in the network	
	Should support aggregating and load balancing of traffic to two or more peer switches within same VLAN	
	Should support G.8032 standard based or equivalent protocol for ring backbone	
	Should have Port based VLAN, MAC based VLAN, private VLAN and 802.1 AK for dynamic VLAN propagation	
	Should have Local, Remote and multisession port mirroring (minimum 4 session)	
	Support Standard based protocols for lossless transport of real time data with dynamic QOS reservation.	
	Should have 8 Hardware QOS Queues per port	
	Should have traffic rate limiting with Configurable bandwidth granularity of 8 KBps	
	Should have Link Layer Discovery Protocol (802.1ab) to allow recognition of third party network devices and LLDP MED for auto configuration	
	Should have MAC address tracking and notification for mac address addition , delete or movement in the Network	
	Should support policy based routing and switching	
	Should have basic dynamic routing protocols like RIP from day 1 and be upgradeable to OSPF , PIM , VRRP	
	Should have Configurable multicast session limit per port	
<b>4. Security</b>		
	Local authentication database for RADIUS Authentication for 802.1x login	
	Should have MAC security – Lockdown & Limit and MAC address tracking with syslog & snmp notification	
	Should support SSH and SFTP or equivalent protocols with encryption/authentication. It is to be ensured compatibility of file transfer capabilities with SSH server(s).	
	Should have dynamic arp inspection , DHCP snooping, Private VLAN, SYN attack protection, GARP protection	
	Should have ASIC based traffic flow analysis based on Netflow/ sFlow/ Ipflix	
	Should have minimum 1 K ACL entry support and Time Based ACL	

<b>5. Management</b>		
	Should have scheduled archiving / uploading of configuration and system log to a central server	
	Should support inbuilt DHCP server and Client for quick configuration of endpoints and switch	
	Telnet server , ssh server, Ping and trace route over Ipv6	
	Must support Layer2 Ping and Layer 2 Internet Control Message Protocol (ICMP) packets for connectivity and Fault Management or equivalent standard protocol to achieve the functionality	
	Web, Console and CLI management	
	Dual firmware and configuration rollback	
	Should be SDN capable with Open stack support and Open Flow API support, Should support enhancement of transmission selection to support allocation of bandwidth amongst traffic classes , for the same IEEE P 802.1 Q or equivalent standard can be accepted .	
	Browser based bandwidth monitoring NMS may be used for this purpose	
	Should support Energy Efficient Ethernet 802.3az	
<b>4. Warranty &amp; Certification</b>		
	Model should have safety and standards certifications as below : IEC61000-4-6:2008/EN61000-4-6:2009, IEC61000-4-8:2009/EN61000-4-8:2010 , EN55011:2009+A1:2010, EN 55022:2010 Class A, CISPR 22:2008 Class A, CISPR24:2010ClassA, Radiated Immunity 10V/m,80-960MHz,CriteriaA, UL60950-1 2ndEd, CE 2.0 Compliant	
	Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

#### 4. Technical Specification of 48 Port Gigabyte Access Switch

<b>48 Port Gig Switch - Preferred Make: Cisco / Extreme / juniper / HP /Alcatel Lucent/ Dell/Huawei</b>		
<b>Sr. No.</b>	<b>Generic Requirements</b>	<b>Compliance (Y/N)</b>
<b>1. Interface requirements</b>		
	Minimum of 48 ports 10/100/1000 Base T and 4x 10G SFP+ ports	
	1 Console Port, USB Port / External Flash	
	Support stacking for minimum upto 4 switches with minimum 32 Gbps stacking with scalability to design and functional requirement.	
	Have Redundant Power Supply support and fan to adjust to varying weather conditions in campus.	
<b>2. Design &amp; Performance</b>		
	Each switch should have minimum 176 Gbps or more with non blocking architecture and Forwarding rate of 130 Mpps	
	Switch should be equipped with minimum 1 GHZ CPU , 1GB RAM and 4 GB Flash	
	Should have LED indicator for per port status , FAN, PSU and	

	Management Status	
	0°C to 45°C operating temperature and 10% to 90% relative humidity	
	Hardware and software configuration have for IPv6 from day one	
<b>3. Switching / Routing</b>		
	Should have 16 K MAC Address, 1 K active VLAN	
	Should support 10 K ARP entries	
	802.1D spanning Tree and PVST+, 802.1w, 802.1s , Should have BPDU Guard or equivalent feature on edge port to auto disable port for a configurable time period to if an accidental loop occurs in the network	
	Should support aggregating and load balancing of traffic to two or more peer switches within same VLAN	
	Should support G.8032 standard based or Equivalent protocol for ring backbone	
	802.1Q VLAN on all ports with support for 4000 concurrent VLANs, and 802.1AK or equivalent for dynamic VLAN propagation	
	Should have Local, Remote and multisession port mirroring (minimum 4 session)	
	Support Standard based protocols for lossless transport of real time data with dynamic QOS reservation.	
	Should have 8 Hardware QOS Queues per port	
	Should have traffic rate limiting with Configurable bandwidth granularity of 8 KBps	
	Should have Link Layer Discovery Protocol (802.1ab) to allow recognition of third party network devices and LLDP MED for auto configuration	
	Should have MAC address tracking and notification for mac address addition , delete or movement in the Network	
	Should support policy based routing and switching	
	Should have basic dynamic routing protocols	
	Should have Configurable multicast session limit per port	
<b>4. Security</b>		
	Local authentication database for RADIUS Authentication for 802.1x login	
	Should have MAC security – Lockdown & Limit and MAC address tracking with syslog & snmp notification	
	Should support SSH and SFTP or equivalent protocols with encryption/authentication. It is to be ensured compatibility of file transfer capabilities with SSH server(s).	
	Should have dynamic arp inspection , DHCP snooping, Private VLAN, SYN attack protection, GARP protection	
	Should have ASIC based traffic flow analysis based on Netflow/ sFlow/ Ipfix	
	Should have minimum 1 K ACL entry support and Time Based ACL	
<b>5. Management</b>		
	Should have scheduled archiving / uploading of configuration and system log to a central server	
	Should support inbuilt DHCP server and Client for quick configuration of endpoints and switch	
	Telnet server , SSH server, Ping and traceroute over Ipv6	
	Must support Layer2 Ping and Layer 2 Internet Control Message Protocol (ICMP) packets for connectivity and Fault Management.	



	Web, Console and CLI management	
	Dual firmware and configuration rollback	
	Should be SDN capable with Open stack support and Open Flow API support, Should support enhancement of transmission selection to support allocation of bandwidth amongst traffic classes , for the same IEEE P 802.1 Q or equivalent standard may be accepted	
	Browser based bandwidth monitoring. NMS may be used for this purpose.	
	Should support Energy Efficient Ethernet 802.3az	
<b>6. Warranty &amp; Certification</b>		
	Model should have safety and standards certifications as below : IEC61000-4-6:2008/EN61000-4-6:2009, IEC61000-4-8:2009/EN61000-4-8:2010 , EN55011:2009+A1:2010, EN 55022:2010 Class A, CISPR 22:2008 Class A, CISPR24:2010ClassA, Radiated Immunity 10V/m,80-960MHz,CriteriaA, UL60950-1 2ndEd, CE 2.0 Compliant	
	Switch should be covered by 24 x 7 TAC support with India Toll Free number and NBD RMA directly from OEM India Depot	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

### 5. Technical Specification of Wireless LAN Controller

<b>Wireless LAN Controller ____</b>	<b>Compliance</b>
<b>Preferred Make: Cisco / Extreme / HP/ Alcatel Lucent/ Dell/Huawei</b>	<b>Yes/No</b>
<b>Hardware</b>	
Hardware Appliance Populated with 50 number of AP licenses from day 1 and scalable to support Scalable to support up to 120 AP per controller	
4 X 1G Interfaces	
Temperature 0 to 45 degC Humidity 10% to 90%, non-condensing	
It should be deployed in a way that connected wireless users should not face any outage and new users should be able to join in even if the connection to the controller goes down or controller gets rebooted. Redundancy between controllers should be ensured. If additional controller is required for this then the same should be quoted.	
<b>Architecture</b>	
The system architecture should provide all of these topologies	
1. Routed at controller: The WLAN controller may acts like a L3 router forwarding the WLAN traffic into the LAN	
2. Bridged at controller: The WLAN controller acts as a L2 Switch forwarding the WLAN traffic into the LAN using specific VLANs	
3. Bridged at Access Point: WLAN traffic is forwarded directly at the LAN Entry port of the AP using specific VLANs.	
4. All offered access point models must be able to support these topologies simultaneously.	
5. The system must be able to change the topologies for each client after authorization	
6. Each authentication session must be controlled by:	
7. individual access rule sets	
8. VLAN Assignment	

9. Qos per User or application with bandwidth limitation in and outbound	
10. Security architecture compliant to IEEE 802.1x for WLAN Clients	
11. Radius-Support with Pre Authentication and Pairwise Master Key (PMK) Caching providing roaming transition < 50 ms or as per IEEE 802.11 I standard	
12. The controller architecture allows meshing of multiple controllers.	
13. VPN, Video and VoIP support with Fast Roaming and minimum five Qos Profiles for L2/L3	
14. Call Admission Control (CAC) controlled approval of new voice streams	
15. Multicast limitation per Wi-Fi service set, Bonjour support	
16. Supports QBSS (Providing actual load situations to the client to enable intelligent roaming)	
17. Supports UAPSD (Unscheduled Automatic Power Save Delivery)	
18. Flexible Client Access to enhance throughput of 802.11n clients	
19. Supports native integration with Location-Based-Services (EKAHAU , Aeroscout)	
20. Supports Energy Save Mode to reduce the AP's power consumption while no client is associated	
21. Supports Band Preference to move clients into the less used 5GHz band.	
22. Supports Link Aggregation for load balancing and redundancy	
<b>Availability</b>	
· High availability with LAN using OSPF or EIGRP dynamic routing	
· If one controller fails, the backup must be capable of covering all APs	
· Access Points are capable to operate when controller fails (local L2-Bridging)	
· When the primary RADIUS server becomes unavailable, the WLC will failover to the next active backup RADIUS server	
<b>Configuration</b>	
· Wizard for guided basic setup, high availability and WLAN services	
· AP configuration and operation in L2 and L3 topologies	
· MAC-Blacklist/Whitelist	
· Support of Rulesets per User,SSID, Interface and AP in all topology variations.	
· Support Application Signatures and defining of L7 rulesets to block applications ( eg Facebook / Youtube / Vimeo / Email ) per user and per user group	
· Opportunistic Key Caching (OKC) for secure and fast roaming	
· Supports Wireless Distribution System (WDS) or equivalent methodology	
· Supports Dynamic Meshing to establish load balanced WDS structures or equivalent methodology	
· Supports WIPS functionality with Countermeasures for Internal and External Honeypots	
· Rogue Access point Detection and Prevention	
<b>Diagnostic Tools</b>	
Ability to generate Network Use statistics per user with application visibility using netflow or equivalent	
Client Association, client statistics	
WLAN and LAN interface statistics	
· Reports can be accessed via GUI and exported via HTML and accessed via SNMPv2	

· Administrative access must be secured via RADIUS.	
· Controller independent management of Interference detection per channel, automatic channel switch , interference reaction and channel release after interference situation is cleared	
· Detection and compensation of insufficient coverage or AP failure by automatic power control.	
<b>Management</b>	
· Full management of all featur s via: Webinterface (HTTP/HTT Ps), SNMP V1, V2.c,V3, CLI (Telnet / SSH)	
· IPv4 and v6 support	
· Supports encrypted communication between AP and controller using IPSEC, IKEv2, AES and Diffie-Hellman protocols.	
· Packet Encapsulation via CAPWAP or equivalent Tunneling Protocol.	
· New APs must be approved by the admin before integration.	
· Suport definition of virtual network services with several RADIUS based authentication methods and rule sets	
· Site specific assignment of APs, network services and rulesets	
· Inter WLAN-Client Traffic blocking option.	
· Supports routed IP subnet with separate DHCP service	
· Optional support of 3rd party AP via dedicated port.	
· Integration in unified LAN/WAN Management with patch management, automatic config backup/restore and ruleset roll-out	
· Supports 802.11 real time capture in wireshark format	
· Supports RFC-3580 tunnel-id adaption into filter rule sets or equivalent methodology is desired	
<b>Guest portal</b>	
· Integrated Guest access System:	
- customizable log in page	
- Ticket-Templates	
- local account management	
- Ticket administration portal	
· Guest access via Captive Portal authentication and limited access for unauthorized clients - Walled Garden	
· HTML-Editor for portal customization	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

## 6. Technical Specification of Wireless Access Point

Wireless Access Point	Compliance Yes/No
Access Point (AP) with two independent radio units 802.11 a/b/g/n/ac and External Antennae Operating temperature 0 to 45 deg C, Humidity 10%-90%	
802.11ac: Features: BPSK, QPSK, 16QAM, 64QAM, 256QAM with OFDM Support Packet aggregation: A-MPDU, A-MSDU 802.11ac Very High-Throughput (VHT): VHT20/40/80 Advanced Features: LDPC, STBC, Maximum Likelihood (ML) Detection 802.11n: BPSK, QPSK, 16QAM, 64QAM with OFDM	
3x3 MiMO , Minimum 3 X Spatial Steam & minimum 75K packet per second on wired 2.4-GHz (600 Mbps max) and 5-GHz (1.3 Gbps max) or better radios, each with 3x3 MIMO and three integrated antennas	
2x 10/100/1000 BaseTX Ethernet Port configurable in Active / Passive or Aggregated with LACP , dedicated Console Port	
Supports MCS schemes 0-23 and receiver sensitivity of -92 DBM or better	
Supports Transmit-Beam forming for high reliability and performance for voice / video / data	
Multicast to unicast Conversion as per standard.	
Real time RF management of interference detection per channel, automatic channel switch, interference reaction and channel release after interference situation is cleared	
Must support optional manual TX power setup in 3db steps per frequency band (in increment of 0.5 dB ) or better .	
Roaming and minimum five Qos Profiles according to IEEE 802.11e or equivalent. Pre standard Legacy applications and clients must be also prioritized.	
Packet Encapsulation via standard tunneling protocol to achieve Functionality	
Supports min. 16 SSID per AP	
Identification, containment and control for protocols like Bonjour, LLNMR, UPnP	
Onboard Encryption supports Wired Equivalent Privacy (WEP), WPA (WiFi Protected Access) and WPA2 (IEEE 802.11i,AES), IPSec, IKEv2 or equivalent standards . In case of alternate standards N1 IT 03 shall take approval from NMRCL during design	
Security architecture compliant to IEEE 802.1x for WLAN Clients	
Radius-Support with Pre Authentication and Pairwise Master Key (PMK) Caching providing roaming transition < 80 ms or better ,Support for Opportunistic Key Caching	
Support of X.509 Certificates	
Supports VoWLAN with SVP,WMM, 802.11e	
Supports L2 -L3 & L4 Access lists on the AP	
User based and Rule based Rate limit SSID based Traffic prioritization	
L7 application based Rules to detect and control Application rules	
Supports layer3 roaming day 1	
Supports feature set and power save mode of VoWLAN devices	
Supports optimized roaming by defined disassociation of VoWLAN devices based on bandwidth thresholds.	

Supports branch office mode: APs can act controller independent as local Bridges with up to 4K VLAN IDs	
IEEE 802.11h DFS and TPC Support	
Supports CLI management and also Management via WLC	
Simultaneous bridging at AP or equivalent standard and tunnelling into the controller and the same SSID	
Supports mesh capability and Dynamic Mesh creation	
Supports IPv6	
Detects and classifies RF interference (Spectrum Analysis & Fingerprinting of interfering frequencies such a bluetooth, microwave etc) without impact to packet	
Integrated WIDS and WIPS function without impact to packet forwarding	
Client Load Balancing between AP's	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution intended functionality shall be achieved. It shall be discretion of NMRCCL to approve the solution</b>	

<b>Indoor Access Point with integrated Antennae</b>	Compliance Yes/No
Access Point (AP) with two independent radio units 802.11 a/b/g/n/ac and External Antennae Operating temperature 0 to 45 deg C, Humidity 10%-90%	
802.11ac: Features: BPSK, QPSK, 16QAM, 64QAM, 256QAM with OFDM Support Packet aggregation: A-MPDU, A-MSDU 802.11ac Very High-Throughput (VHT): VHT20/40/80 Advanced Features: LDPC, STBC, Maximum Likelihood (ML) Detection 802.11n: BPSK, QPSK, 16QAM, 64QAM with OFDM	
2.4-GHz (600 Mbps max) and 5-GHz (1.3 Gbps max) or better radios, each with 3x3 MIMO and three integrated antennas	
2x 10/100/1000 BaseTX Ethernet Port configurable in Active / Passive or Aggregated with LACP , dedicated Console Port	
Supports MCS schemes 0-23 and receiver sensitivity of -92 DBM or better	
Supports Transmit-Beamforming for high reliability and performance for voice / video / data Multicast to unicast Conversion on AP	
Real time RF management of interference detection per channel, automatic channel switch, interference reaction and channel release after interference situation is cleared	
Must support optional manual TX power setup in 3db steps per frequency band (in increment of 0.5 dB ) or better .	
Roaming and minimum five Qos Profiles according to IEEE 802.11e or equivalent. Pre standard Legacy applications and clients must be also prioritized.	
Packet Encapsulation via standard tunneling protocol to achieve the functionality	
Supports min. 16 SSID per AP	
Identification, containment and control for protocols like Bonjour, LLNMR, UPnP	
Onboard Encryption supports Wired Equivalent Privacy (WEP), WPA (WiFi Protected Access) and WPA2 (IEEE 802.11i, AES), IPSec, IKEv2	
Security architecture compliant to IEEE 802.1x for WLAN Clients	

Radius-Support with Pre Authentication and Pairwise Master Key (PMK) Caching providing roaming transition < 80 ms or better ,Support for Opportunistic Key Caching	
Support of X.509 Certificates	
Supports VoWLAN with SVP,WMM, 802.11e	
Supports L2 -L3 & L4 Access lists on the AP	
User based and Rule based Rate limit SSID based Traffic prioritization	
L7 application based Rules to detect and control Application rules	
Netflow support for traffic analysis or equivalent.	
Supports Layer3 roaming day 1	
Supports feature set and power save mode of VoWLAN devices	
Supports optimized roaming by defined disassociation of VoWLAN devices based on bandwidth thresholds.	
Supports branch office mode: APs can act controller independant as local Bridges with up to 4K	
IEEE 802.11h DFS and TPC Support	
Supports CLI management and also Management via WLC	
Simultaneous bridging at AP and tunnelling into the controller an the same SSID	
Supports mesh capability and Dynamic Mesh creation or equivalent	
Supports IPv6	
Detects and classifies RF interference (Spectrum Analysis & Fingerprinting of interfering frequencies such a bluetooth, microwave etc) without impact to packet forwarding	
Integrated WIDS and WIPS function without impact to packet forwarding	
Client Load Balancing between AP's	
Airtime fairness	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

### 7. NAC / Identity Services for Network Visibility

**Vendor should provide a NAC solution meeting the following requirements as a minimum:**

<b>Management and Monitoring</b>	<b>Compliance Yes/ No</b>
Must be from same OEM as wired and wireless and provide centralized management that should be able to manage all network components	
Must be able to support minimum 50 IP nodes, 250 Wireless AP and scalable to double the current capacity	
Must provide a utility to view and select MIB objects from a tree-based representation	
Must have SNMP MIB compile capability to integrate any 3rd party snmp compliant device	
Must allow for graphing or viewing in table format and multiple OIDs that are user selectable.	
Must be able to create correlated topology based on LLDP , SNMP , L2 and L3 protocol connectivity hierarchy	
Must allow system-level operations such as device discovery, event management, logging and application maintenance to be performed centrally.	
Must provide the capabilities to modify, filter, and create your own flexible views of the network.	
Must allow scheduled events or tasks that the user can perform behind the scenes or schedule an event for another time in the future.	
Must provide a system wide deployment of VLAN configuration and monitoring capabilities.	
Must support RADIUS and LDAP Authentication for users of the application. N1 TI03 may propose equivalent application to achieve functionality to NMRCL for review and approval	
Must be able to define policies to rate-limit bandwidth, throttle the rate of new network connections, prioritize based on Layer 2 or Layer 3 QoS mechanisms, apply packet tags, isolate/quarantine a particular port or VLAN, and/or trigger pre-defined actions.	
Must provide a tool to search and locate the physical location of connected devices and end users, quickly and easily.	
Must allow IT administrators to easily define a number of pre-configured network policies, and designate select personnel to activate/deactivate these policies as appropriate	
Must provide an audit trail (event log) of changes done	
Must provide a detailed inventory of products organized by device type.	
Must provide the ability to track attributes such as serial number, asset tag, date and time of configuration saves, firmware version, and file size.	
Must be able to provide a centralized history of firmware and configuration changes and other inventory management operations made to a device.	
Must be able to generate valuable, in-depth capacity reports of used and unused resources for network inventory planning purposes.	
Must support the ability to download firmware and boot PROM images to single or multiple devices simultaneously.	
Must be able to schedule routine device configuration back-ups.	
Must be able to download text-based (ASCII format) configuration templates to one or more devices.	
Must provide a interface with troubleshooting and monitoring tools ( Ping / Traceroute, SSH, Telnet, Http/s )	
Ability to do Flow analysis (sflow / Netflow / jFlow)	

Must provide wireless analytics like RSSI value per client, Wireless Bandwidth and User Roaming history	
Must be able to interact with network security devices and push template based automated response to security events and thus remediating real time threats . This functionality to be achieved based on open applicable standards .	
Must be scalable to provide open XML APIs for integration with third party applications / Cloud Connect if necessary with additional licenses	
Must be scalable to add additional plugin modules to enhance capacity of the system to do security monitoring , NAC , Application Detection , Latency measurement , BYOD	
Should be able to integrate with all makes of manageable network devices which are capable of supporting open standards based protocols required for NAC operation	
Solution should be with preinstalled OS or dedicated hardware Appliance	
Must provide Network Access Control, BYOD service, Guest Management with Captive Portal in a single pane of glass for the entire infrastructure including Wireless and devices for minimum of	
Solution should support upto 1000 devices and scalable to 2000 Devices	
Should be provided with 1 + 1 Redundancy for Layer 2 deployment mode that provides high-availability and eliminates single point of failure	
Solution should be deployable in a distributed mode with different units for Different Locations for ease of management, Authorization and Policy Control. All individual Units should be integrated to one central Control Unit with hierarchical management access	
Solution must utilize standards-based authentication mechanisms enabling non-intelligent devices the ability to connect to the network and receive the proper network services.	
Should be able to gather Detailed identity and access information with OS and it is desirable to have device fingerprinting for at least 25 different types of OS.	
Interactive topology maps to locate the end system s per network connectivity	
Support event logging of Device Access and Activity Time Stamp	
Device search functionality by attributes such as user name / OS type / IP- MAC address / System Name	
Must support automated onboarding and self registration of network and mobile devices. Should not require installation of additional external application to bind specific device to services.Must also offer the option of sponsorship capabilities to validate guest registration without involvement of IT staff.	
Must Support location based Registration portals to redirect Users entering through common SSID to different portals for different Network Zones	
Must be able to vulnerability assessment to expose points of penetration for the endpoints	
Must support automated context based policy provisioning of network services for mobile devices	
Must provide comprehensive visibility into all managed mobile devices in the infrastructure.	
Must provide a vendor agnostic integration architecture that can support a variety of MDM platforms	
Must provide integration services with 3rd Party End point integrity check softwares.	
Must provide interoperability with Microsoft NAP and Trusted Computing Croup TNC.	
Solution must support User Validation as well as device Validation for two factor security against an AD or LDAP database1	
Must provide open XML APIs for integration with third party applications.	
Must support the ability to monitor end-system events and view the health results from an end-system's latest assessment scan.	
Must provide easy-to-use dashboards and detailed views of the health of the end systems attached or trying to attach to the network.	



Must provide the ability for analysts to be able to easily tailor the dashboard views to present the information in their preferred format.	
Must be able to generate reports as PDF files.	
Should be capable of reporting for historical and real-time data. Should be equipped with Custom report designer to meet the needs of specific data attributes and periodic email of the same to relevant Administrative team.	
IPv6 support for implementation in networks with IPv6 end systems.	
Support Management Access Authentication and Authorization for Network Device Access	
Support Manipulation of Radius Attributes for Authentication as well as Radius Accept	
Support integration with multiple LDAP / AD and Radius servers	
Should tight integration with the NMS OEM to integrate and display the user identity information in context to the Network Devices they are connected via.	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

### 8. Technical and Functional Specifications of UTM

Sr. No.	Generic Requirements	Compliance (Y/N)
<b>Physical attributes</b>		
1	The proposed vendor must have a track record of continuous improvement in threat detection (IPS) and must have successfully completed NSS Labs' NGFW Methodology v6.0 testing with a minimum exploit blocking rate of 99%	
2	Network security appliance should support "Stateful" policy inspection technology. It should also have application intelligence for commonly used TCP/IP protocols like telnet, ftp etc.	
<b>Interfaces</b>		
3	8 x GE RJ45 inbuilt interfaces & 8 x 1GE SFP interface slots & 2x 10GE SFP+ Slots populated with 2x 10GE SFP+ Short Range Transreceivers from day one	
4	The Appliance should have 1xUSB and 1xConsole Ports	
<b>Performance and Availability</b>		
5	The Firewall should be on ASIC Based architecture with minimum 24 Gbps of Firewall throughput, 5,500,000 concurrent sessions, and 270,000 new sessions per second support from day one and Firewall Latency should not be more than 3µs	
6	Minimum IPS throughput 7 Gbps	
7	IPSec VPN throughput: minimum 14 Gbps	
8	Simultaneous IPSec VPN tunnels: 10,000	
9	Should have 1000 SSL VPN peer support from day one	
10	The solution should have minimum 8GB of RAM & 16GB of flash memory from day one	
11	The solution should support minimum 10 Virtual Firewalls from day one	
<b>Routing Protocols</b>		
12	Should support Static Routes & Policy Based Routing	
13	Should support dynamic routing protocol like RIP, OSPF, BGP, ISIS	
<b>Protocols</b>		
14	TCP/IP, PPTP	

15	RTP/ L2TP	
16	IPSec / GRE, DES, 3DES, AES	
17	PPPoE	
18	FTP, HTTP, HTTPS	
19	SNMP, SMTP	
20	DHCP, DNS	
21	IPv6-enabled inspection services for applications based on HTTP, FTP, SMTP, ICMP, TCP, and UDP	
22	Allows secure deployment of next-generation IPv6 networks, as well as hybrid environments that require simultaneous, dual stack support of IPv4 and IPv6	
<b>Other support</b>		
23	Network Address Translation (NAT) shall be configurable as 1:1, 1: many, many: 1, many: many, flexible NAT (overlapping IPs). Reverse NAT shall be supported.	
24	The proposed system should have integrated Enterprise-class Web Content Filtering solution with database which should have at least 45 million rated websites and 75+ categories without external solution, devices or hardware modules.	
25	Should support features like Anti-Virus,IPS,Web-Filtering, Application-Control, Gateway DLP, Web Application Firewall from day one	
26	The product must supports Layer-7 based UTM/Firewall virtualization, and all UTM features should be supported in each virtual firewall like Threat Prevention, IPS, Web filter, Application Control, content filtering etc.	
27	Should support LDAP, RADIUS, Windows AD, PKI based Authentication & should have integrated 2-Factor Authentication server support.	
28	Should have a built-in Signature and Anomaly based IPS engine with minimum 10000+ IPS Signature support from day one on the same unit & also the IPS should have DDoS and DoS anomaly detection and protection mechanism with threshold configuration.	
29	The solution should have inbuilt server load balancing functionality from day one	
30	Should have integrated Application control solution & Should have identification support for at least 3000+ applications and the identification should be regardless of ports. The applications need to be predefined on the box.	
31	The Firewall should have integrated solution for VPN and there should be no user based licensing for SSL VPN &IPSec VPN as well	
32	The solution should have the flexibility to write security policies based on IP Address & User Name & Endpoint Operating System	
<b>QoS</b>		
33	QoS features like traffic prioritization, differentiated services,. Should support for QoS features for defining the QoS policies.	
<b>Management &amp; Reporting</b>		
34	Support for Built-in Management Software for simple, secure remote management of the security appliances through integrated, Web-based GUI, SSH, Console Port etc.	
35	Should support SNMPv1, SNMPv2, SNMPv3	

36	Should capable to provide a convenient method for alerting administrators when critical events are encountered, by sending e-mail alert messages to administrator defined e-mail addresses	
37	Reporting solution should be provided in a separate appliance with minimum 1 TB of usable storage capacity and extensive logging & reporting for all the security functionalities offered, quarantining of blocked or infected files should be supported, should provide graphical summary reports & customized reports as well	
<b>Certification</b>		
38	Appliance shall be ICSA certified for Firewall, IPSec VPN, SSL VPN, IPS, AV security functionalities	
39	Product OEM should have its own Technical assistance centre (should not be outsourced) in India	
40	OEM should be in Leaders quadrant of Gartner's – in UTM Magic Quadrant for the last three year.	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

### 9. Technical Specifications for NMS (Network Management Software)

Technical Specification	Compliance (Yes / No)
<b>General Features</b>	
The solution should be scalable to monitor & manage more than 50000 devices and minimum 3 reference case studies should be provided	
The solution should be capable of running in Linux platform with open source database as backend	
Solution should be available as Commercial-Off-The-Shelf (COTS) software	
Solution proposed should have option to offer as service on subscription basis	
Both IPv4 and IPv6 supported for monitoring	
Multiple and Multilevel Grouping Support	
Provides the complete flexible presentation layer to satisfy any complex need by doing the configuration itself instead of any additional customization.	
Provide option to form the multiple folder level grouping depends on the various operation needs like actual network deployment structure, based on the location of the devices, based on the department of the devices and based on the customer usage etc...	
Creation of new groups should be as simple as creating the folders	
provides the option to create N level subfolders depends on the need without any restriction	
Minimum of three different level of grouping for the devices should be supported and provide the option to increase the grouping based on the need without affecting the existing grouping structure	
Provides the option to create the grouping based on the service offered to customer and map all the devices involved in the specific service till the component / resource level	
Should able to measure the Service level availability, downtime, SLA computation by considering all the devices and resources involved the in the service instead of individual device or resources depended.	

Provides a user specific dashboards and views in web UI	
Provision to define the tables structure/number of table/position of tables in the view and the statistics that needs to be displayed in the dashboards and reports	
Provides the refresh rate of each configured view and the statistical time scale of the data displayed in the view	
Provides a combination of event, site or node based configuration	
Provision to define the font size use in the view	
Provision to use any possible statistic defined the system	
Provides multiple thresholds configuration option for each statistic defined	
Logically define views without changing the actual deployment	
Provision to view domain specific views without changing the actual deployment	
Provides graphical representation of the logical views	
Provides the option to create any number of new views depends on the requirement and assist with the template to copy and modify the existing views	
Specific Configuration till the component / resource level	
Provides the option to configure the Poll interval, Threshold, Alerts, Reports and Dash boards based grouping for devices level and resources level.	
provides the option to do the modification of above details from group level as bulk also till resource level for specific change	
Provides the option to export the views into PDF, Word, Excel, HTML etc. formats depends on the need.	
Role and grouping level based viewing and user management	
Able to allow each account to have specific type of toolbar according to the administrator's requirement and each account can only see/manage list of equipment's allowed in the specific group, device or even resource level	
Able to provide setup type of display format and toolbar as he/she requires for each user account/ profile.	
Able to provide setup of the default page viewed (home page) when the user logs in	
Shall be able to restrict the view of the NMS system based on the kind and configuration of the user	
Able to restrict the users to see only few locations which are under their control instead of looking all the locations.	
Provides the option to choose the logical viewable authorized view in each group for each user.	
Provides the option to have the portal account to the end customers with restricted views limits to their specific infrastructure	
Should support the automatic dynamic threshold configuration with given duration for alarms and alerting.	
Dynamic threshold settings should provide the option to make change in threshold configuration or provide only the suggestion.	
Dynamic threshold should detect anomalies in the network and avoid the usual alarms and alarm flooding.	
Should be completely web based for any purpose instead of client based tools to be installed for the specific configurations.	
It should allow the user to make the Service Group.	
User should able to select any component from different devices like Network interface & device availability from network devices and DB service availability from DB server then Web Service availability from Web Server etc... to configure the Service Group.	
The overall service availability should be calculated against the service group instead of individual devices or the components.	

User should be able to configure their own formula for the service availability, downtime, health etc...	
The proposed solution should have minimum one local customer reference	
<b>Fault &amp; Performance Management</b>	
Discovery has to work intelligently by identifying the device in the network by the given IP range and categorize into network devices and servers with vendor and model details.	
Detect & highlight faults (abnormal situations) occurring anywhere within the network	
Allows the user to configure thresholds to highlight abnormal situations	
Provides threshold detection function to manage the environment proactively	
Provides Filtering, De-duplication, Holding, Suppression and Correlation capability to let user focus on the critical event that affects the business and business processes	
Provides multi-level (preferably six level ) Severity definition, will handle events automatically and inform the designated person as per operational requirement.	
Provides event configuration where any selected node once being monitored goes down, an alert/event is generated and will be shown on the alarms browser	
Proactively monitors the health & performance of the network	
Displays status of network equipment's / servers/ PCs up to interface level of the equipment	
Collect and process specific data to provide the user with the effectiveness of the system, processor, network interface, process and memory of a Windows NT/2000 terminal, workstation, or server	
Allows the user to measure the Server's performance matrix like CPU, disk, memory utilization and number of concurrent connection and hence assist the user in achieving minimum downtime	
Displays utilization of CPU, memory and disk of servers/PC and equipment's within the network	
Provide special views to highlight the performance details of each device	
Provide user configurable thresholds for fault definitions of each resource	
Filters monitoring data based on the node, resource type, IP address, Time Scale etc.	
Provide views based on the Average, worst and threshold based values	
Provide separate views for network devices & servers	
Collects SNMP information, providing reports on network utilization and the health of various network devices like routers and switches independent of any vendor	
Monitors all traffic from various interfaces of the network device	
Provides traffic Utilization based on individual interface level, nodes level or based on the group by location, branch, departments etc... as an Avg, Min and Max bandwidth, utilization, throughput or any custom monitoring parameters.	
Provides Throughput In/Out for each available interface of the network device	
Provide trend reports from dashboards displaying monitoring data	
Provision to change the polling interval to any frequency depending on the priority till the individual component / resource level like each interface might have the different polling interval in the same device based of the criticality and importance of service customer	
Provision to disable and enable the polling of specific type of devices	
Disable should support individual component or resource level depends on the operation needs for maintenance etc..	
Displays traffic of individual VLANs	

Create multiple dashboards to reflect traffic for various sites / locations with the option of Avg, Min, Max and Sum across all the devices in the site, in the network	
Provision to group the nodes being monitored into specific sites	
Manage distributed, heterogeneous systems - Windows, UNIX & LINUX, including VMWARE ESX from a single management station.	
Provides time based statistic display	
Monitor the following parameters in servers : Virtual and physical memory statistics, Paging and swap statistics, Operating System, Memory, Logical disk, Physical disk, Processor, Paging file, IP statistics, ICMP statistics, Network interface traffic, Cache	
Provides the ability to compare multiple reports using detach option	
Provides alarm suppression withhold time and aid in prevention of flooding	
<b>Notifications/Alerts</b>	
Sends alert via E-mail, SMS, Execute Batch file, SNMP Trap, XML notification, Pop-up window and Audio alert	
Provide metrics with threshold can also be specified that once it is reached, a notification can also occur	
Provide Alarms Suppression capabilities so that any duplicated events can be tracked to provide just a single event notification	
Supports a flexible and dynamic set of threshold alerts, which can be based on port utilization or availability, memory, disk, CPU utilization or any custom specific monitored parameters	
Provide a notification mechanism that allows administrator to define what notification channel to be used in different time of days, and able to trigger multiple notifications to alert multiple person and actions	
Provide escalation and acknowledgement function to provide the mechanism to ensure alternative personnel will be alerted when there is a critical situation and acknowledgement mechanism for generated alerts	
Set and generate different alerts for Poor performance from target devices/server related errors and timeouts	
<b>Reporting</b>	
Provision for change/customization of fields and time interval	
Export file in the format of HTML, PDF, Excel and CSV	
Provide standard reports that display current status of nodes and interfaces	
Reports could be viewed on daily graph (5 minute average), weekly graph (1 hour average minute average), monthly graph (1 hour average) and yearly graph (1 day average)	
In the same time, it should allow the user to choose the different resolution to generate report	
Provides a tool for generating reports that summarize the daily and monthly data kept in the database	
Provides a tool which analyzes collected data with a variety of different reporting functions	
Automatically generate daily reports that provide a summary of the network as well as custom Reports and that are automatically sent by email at a pre-defined schedule to any recipient	
Allows end-users to browse all reports using any web browser like Internet Explorer, Mozilla Firefox, Google Chrome etc. without the need to install any report specific software	
Automatically generate reports that provide a usage summary of the top 1, 4, 10 or 20	

grouping, devices and resources level	
Provide report on single or multiple statistical split based on the operation need as option during the configuration	
Provide correlation report between all major network devices to determine if there is any degradation in these devices	
Provide online and offline reports that allow the user to view the present usage of their devices	
Collect Microsoft Windows NT and Windows 2000 server and above statistics information based on Microsoft Windows Management Instrumentation (WMI)	
Provides a combination of reports in a single simple view, a time selection in the report, default view type in the reports with proper control over the resource names, access control in the reports created, ability to move from one report to another in a single click	
Provides easy mechanism to change the graph type for easy comparison, to reuse an existing report and to modify and save it as a new report	
Provide methods to send the reports by email to specific user or any specified hard-disk destination	
Provide methods to send specific UI pages of the software to users by email	
Provides 90+ out of the box standard graphical reports with statistical information and with option of customizing and configuring new reports without any limitation in number of reports	
provides the option to choose the data points in each reports like raw, summarized intervals	
Provides the option to get the required report as an all hours, business and non-business hours for detailed analysis	
All the reports can be exported to PDF, Word, Excel and HTML etc... format from the client connected system itself instead of server	
<b>Data Processing</b>	
Regularly forward, store and update into a single repository using industry-standard relational database software	
Stores data for a minimum duration of time configurable by the user, default is 1 year	
Provides summarized value of the data being stored in the database and whose time span is more than 1 hour	
Flexibility to store the Raw polled points to summarized data reduction based on the storage availability without any restriction.	
<b>Diagnostics</b>	
Significantly reduce the potential of generating unwanted, non-business critical, alert floods that are symptomatic of many systems management tools by alerting based on a problem identified for an end-to-end, business transaction	
Identifies the root cause of any IT problem detected and filters out irrelevant information to let the user concentrate on solving the problem	
Provide user to define the health index, and based on the criteria setting, user can quickly to spot out what resources required attention even before trigger the threshold	
Supports instant diagnosis of the node status through Ping, Telnet and SNMPwalk	
Support Real-Time report generation for checking continuous reachability of target device	
Provides easy single click diagnostic of devices in a alarm state	
Store comments on typical alarms, these comments can be provided by the administrator	
Provide user friendly messages, providing details of the reason of the problem	

Provision to remove specific type of alarms	
<b>Discovery</b>	
Automatically learn devices that supports SNMP, HTTP, Ping, SMTP, POP3, WMI, PDC, SSH and Telnet along with any required protocol to communicate to the devices.	
Provision to learn the deployment/removal of network devices down to interface level which facilitates systems configuration, significantly saving setup time	
Periodically refreshes the screen and reports the progress of the auto discovery process. The number of IP addresses completed and number of valid IP addresses is shown	
Able to discover any nodes which has IP and are SNMP enabled	
Able to support Equivalent protocols to discover connections between devices and NDP.	
<b>Map Topology</b>	
Display physical map so that the management station can display connection of equipment's being monitored	
Display status information anytime, anywhere via a Web browser, in the form of either a drill-down hierarchical tree of tables or a Topology map	
Provision to learn the different segments within an infrastructure, and systematically map them into an integrated topology map	
Automatically learn IP Networks and their segments, LANs, hosts, switches, routers, firewalls etc. and to establish the connections and to correlate	
Displays in a logical connection pattern on a map showing the connectivity and relationships	
Provision to search specific folder or resources in a view, map to specific background for each level of the network, upload and change icons of devices/background of the network layers	
Provides a drill down view, different time scale of important statistics, user friendly names for the devices using alias names	
Searches specific folder or resources in a view	
Provision to draw new connection between two devices	
Show the status of the connections based on the dependent connections and the utilization of the links by displaying connection with different width	
Display option on each device to perform device specific operations	
Provides user based access	
Automatically populate tree view for single view of entire network infrastructure	
<b>Network Diagram Builder</b>	
Provides provision to draw & map user specific network diagram	
The tool should have Integrated Web based feature to build Network Diagram, No separate client window to configure network Diagram	
Drag & Drop based Network Diagram builder	
Dynamically Upload Images, Customizable objects to support multiple vendors	
Every Network diagram can be able to access by authorized user	
Tool should be able to define Primary & back up line connection, so if primary line fails it should switch over to backup line & notify to administrator	
<b>Multiple Vendor Support</b>	
Support switches from popular vendors and new vendors could be integrated by downloading the specific MIB	
Through API integration, basic auto-discovery and auto-learning capabilities could be extended to support special devices	



Support new devices by compiling corresponding SNMP MIBS using simple text based configuration files	
Gives the operator ability to perform customized analysis on SNMP Raw Data to provide user friendly data to the operators through custom configuration files which can be easily modified by the customers	
Should be adoptable to any IP devices based on the protocol the supported by the new device	
<b>Centralized Management</b>	
Support GUI (Graphical User Interface)	
Provision to access the management station via Web interface	
Can be accessed remotely for configuration and maintenance purposes	
Administers the entire monitoring solution from a single, administrative console accessible via HTTP/HTTPS	
Centrally manage different parameters and values to set the Error, Warning, and Good thresholds of each measurement	
Creates measurement and alert templates that can globally configure common metrics over multiple monitoring profiles and monitoring locations	
Provision to view/control the process and to monitor the status of all remote sites	
Debug the logs of the remote process	
Cover geographically distributed networks through multi-level scalable distributed deployment architecture	
Provides the option to do the Recursive Maintenance configuration, Business and Non Business hour configuration.	
<b>Network Device Configuration Management</b>	
Download current running configuration file from the network devices	
Allows scheduling of automatic download of the configuration file from the network devices	
Alert user on any changes made to the current running configuration file of any monitored device	
Provide a web base and intuitive user interface that showcases the list of devices whose configuration file got changed with option to highlight the changes	
Maintain / store the configuration files of all the monitored devices for reference	
Support base-lining of specific version of the running configuration file of each device	
Support comparison of different versions of the configuration file of a device and comparison of the configuration files across devices	
Showcase the differences among the configuration files into useful categories like added/changed/removed through intuitive UI	
Support loading of a predefined configuration file on to a specific device	
<b>QOS Monitoring (IP SLA/RPM)</b>	
Monitor QoS based on specific parameters and QoS parameters for various devices	
Measure & monitor the following QoS parameters. Latency, Packet Loss, Probes, Packets, Delay, MOS, Jitter, 00RTT (Round-Trip-Time).	
Create multiple dashboards to highlight specific parameters / devices	
Create various reports based on QoS parameters	
Detect quality deterioration by tracking QoS parameters	
Should be open to monitor any additional statistics / parameters for the specific need based on the feasibility	
<b>Flow Monitoring</b>	
The flow collection module should support a distributed architecture	

Able to support multiple Flow technologies like Netflow, sFlow, Jflow, Netstream, IPFIX etc.	
Flow module should help in analyzing root cause of congestion in the network based on host / IP address, application, protocol etc.	
Solution should support Netflow versions 1, 5, 6, 7 and 9	
Solution should support sFlow versions 2, 4 and 5	
Solution should be capable of collecting & storing '100%' flow data and not only sampling flow data	
Solution should have a network map highlighting utilization of all flow exporting devices	
Solution should have a network map depicting link connectivity between different flow exporting devices	
Links on the map should be clickable to further show the report on traffic information for any particular connection	
On-click map reports should provide flow data based on utilization, protocols, applications, IP addresses etc.	
Map links should be color-coded to highlight utilization thresholds	
Map should have an option to use Metro Network Map as background	
Solution should be able to baseline network traffic to detect any abnormal changes in network traffic	
It should be possible to associate the network traffic to the hosts / IP addresses in the network	
It should be possible to set thresholds on network traffic bandwidth & utilization parameters	
Alerts should be generated when thresholds are breached & should have email export options	
In case of a network threat the tool should have capability to provide IT teams the level of deep visibility needed to quickly uncover malware, scope a compromise, and contain the infection before it spreads and causes further damage	
Tool should use global threat intelligence to strengthen network defenses	
Tool should be capable to identify DNS abuse, command and control traffic, and data theft	
Tool should provide a lattice of irregular flow detection capabilities	
It should use proprietary methods combined with globally collected domain reputation lists to determine if advanced, unknown malware evaded front-line defenses	
Tool should help to pinpoint exactly when an end system was compromised, as well as which other systems may have been affected by the malware's lateral movement through your network	
Solution should have the ability and scalability to collect and analyze Flow from Flow enabled devices without interrupting network/application traffic	
Solution Flow generation capabilities should be capable to handle 100 Mbps to 10gbps interface connections	
Solution should have ability to obtain visibility of key applications and Services within the network	
It is able to detect DDOS attacks, DNS hits, NULL scans, SYN violations, FIN violations, P2P etc.	
The traffic monitoring application should proactively analyze flow data to gather and consolidate real time information that allows for faster troubleshooting and less downtime	
It should provide flow data highlighting top applications, top host to host conversations, most utilized interfaces, top protocols, most visited domain names,	

busiest subnets, IP reputation lookups, etc.	
Solution should support enterprise-wide visibility into the behavior of hosts, including a baseline and then any abnormal behavior and flow based monitoring to services and network infrastructure	
solution should provide a full visibility of traffic path across the network with flow visualization	
Solution should be capable of providing an end to end path of the flow through the layer 3 topology	
Solution should have the capability to obtain network trends such as traffic volumes at different times & Traffic baselines in order to profile and understand traffic flows, patterns, and to aid network analysis and troubleshooting of network performance related issues	
Solution should have the capability to provide an easy to use and understand report of the geographic utilization and access of the network as well as security and bandwidth consumption information such as throughput going via a link or switch	
Solution should have the ability to provide audit trail for all network communication flows/flow discovery within and in/out of the given network zone to support investigations into data exposure including hosts exfiltration more data including encrypted data than normal	
Solution should have the ability to utilize a maintained threat information feed(s) to aid detection of emerging / zero day threat and real-time reporting and analysis of network flow data	
Solution should be capable of prioritizing the devices which pose the largest threats to the network	
Solution should have the ability to map security policies, perform audits and detect and report policy violations and non-compliant flows and alarm when these policies are violated	
Solution should have the ability to filter and remove duplicate flows from multiple NetFlow Sources	
Solution should have the capability to support NetFlow Stitching	
Solution should provide easily customizable reports without the need for understanding query languages or the use of an external query tool	
Solution should deploy a method to identify and organize (i.e. Keep it in a separate domain) device by location, IP Address and function	
Solution should support a visual tracker of the propagation of malware across the network to identify the route of the malware and identify the victims	
Solution should support a Cyber Threats Dashboard showing the security posture of the network with a simple way to find root cause events such as Policy Compliance, Traffic Spikes, Worm Activity and user activity in both real time and in historical context	
Solution should support methods for accessing User Identity Information such as LDAP and a method to correlate user to host	
Solution should provide traffic reports for Firewall rule creation and auditing	
Solution should support easy to use workflow for incident investigation.	
Solution should support role based access	
Solution should be capable of storing all flow records in 1-minute intervals	
Solution should have a strong flow storage capability to store data upto more than 10 years	
<b>Syslog Monitoring</b>	
Collect & display syslog's from network devices, servers, desktops etc.	

Group syslog's based on severity (Critical, Major, Normal, Minor)	
Display Host Device, Event ID, Source, Category, User for each syslog message	
Filter syslog messages based on Timescale	
Display a syslog-specific dashboard	
Send Email / SMS alerts for specific syslog messages	
Provision to sort syslog's based on Event ID, Source, Category, Users & Message	
Provide a user-friendly view for displaying syslog messages	
<b>Monitoring of Infrastructure Services</b>	
IIS / Tomcat / or their equivalent Web server statistics.	
HTTP service, HTTPS service, FTP server statistics, POP/SMTP services, ICMP services	
Database Services – Data Base parameters monitoring such as database tables / table spaces, logs etc.	
<b>Virtualization Monitoring</b>	
Monitor VMWare ESXi servers, Hyper Servers, Xen servers, KVM and all market standard virtualization environment	
Monitor important server parameters like CPU, Memory, Disk Utilization for virtual servers	
Monitor network utilization & bandwidth of virtual servers	
Track number & Speed of CPU cores, number of CPU threads, number of network adapters of virtual servers	
Track resources (memory, CPU, storage) allocated to Guest OS systems running on the VM servers	
Generate health & utilization reports for Physical VM / Hyper servers	
Generate guest OS resource utilization reports for each Physical VM / Hyper servers	
Create multiple dashboards for Virtualization Monitoring highlighting important monitoring parameters	
<b>Service Level Management</b>	
The proposed tools should automatically document problems and interruptions for various IT services offered and integrate with the service level management system for reporting on service level agreements (SLAs).	
Able to provide SLA availability Management thru its generated reports and nodes or even segment's SLA can be tracked daily, weekly or monthly	
Able to proactively monitor the SLA conformance and send alerts through e-mail, SMS, whenever it falls below the specified performance level	
Able to define measurable service indicators that affect the business bottom line, and translate them to binding guarantees from internal or external providers	
Able to supports a flexible SLA definition to address the most complicated requirements such as pre-defined scheduled downtime, mix-and-match of multiple statistics with Boolean operators	
Able to proactively monitors the SLA conformance and alerts the concerned person through email, SMS, Pop up, Batch Script notification whenever it falls below the specified performance level	
Able to measure SLA with excluding public holiday and schedule outage	
Able to compare SLA for different time zone	
Able to measure to compare SLA against performance result on link level	
Able to provide SLA trending analysis	
Able to compare all SLA measurement in ascending or descending order	
Able to define templates for the SLAs and use them across different resources being	

monitored	
Should facilitate the input of service level targets in terms of operational requirements	
Should manage the scheduling of the review cycle and life span of an SLA.	
Should automate service delivery threshold monitoring against defined service agreements	
Should record the actual resolution and Response time against the required as per SLA	
Should facilitate the production of real time graphical service summaries, including identification of threshold breaches.	
Should facilitate the input of service level targets in terms of operational requirements	
Should manage the scheduling of the review cycle and life span of an SLA.	
Should automate service delivery threshold monitoring against defined service agreements	
Should record the actual resolution and Response time against the required as per SLA	
Should facilitate the production of real time graphical service summaries, including identification of threshold breaches.	
Should facilitate the customization of reports to a specific audience	
Service Level Reports to analyze & display service level information for an organization, region, department or business process for e.g. a typical business unit service level report for research and development department should indicate evaluation of the performance of all the systems, routers, LAN/WAN segments, and applications within that department.	
Service should be monitored based on the group of resources / components involved in the specific service offering instead of specific component basis.	
The overall downtime should be calculated based on the service group instead of individual components	
Downtime calculation should consider the backup line as well if available during the branch outage calculation	
<b>Deployment Architecture</b>	
Should support the Flexible and Scalable Deployment Architecture	
Scalability should be available both in vertical and horizontal manner.	
Scalability can be supported by adding additional servers when required instead of changing the existing infrastructure.	
Provide the option to choose the modules belongs to each each instance of the installation.	
Provide the option to keep the Presentation layer separated from the other engines during the deployment	
Provide the option to keep the Correlator Engine separated from the other engines depends on the scale	
Provide the option to keep the Alert / Notification Engine separated from the other engines depends on the scale	
Provide the option to support multiple port for polling and collecting the details in the network other than default port as well.	
Any additional module should be handled thru the License instead of additional package installation and change in the existing environment.	
Should support the High Availability feature without any third party tool requirement for business continuity	
Should able to manage near to zero downtime during failover	
Failover should happen automatically, without any manual intervention.	
<b>Integration Capabilities</b>	

Integration should provide the option in both north as well as south bound integration on each module level.	
Any fault details should be able to send to third party CRM, Customer Portal, UNMS or even EMS if needed using the Trap, XML and even direct database query integration	
Any performance details should be able to send to third party Billing, Customer Portal and Service Assurance tools.	
Any SLA related calculated details should be able to send to third party Service Assurance tools.	
Any Network inventory details should be able to send to third party Customer Portal and UNMS system by two way communication and sync each other	
Ticketing / incidents should be able to integrated with the Customer portal or other portal being used by NMRCL Etc	
Any collected configuration details should be shared with the third party provisioning or EMS systems.	
Provide XML based system to communicate with external software	
Provide system to communicate with external software	
Provide methods to send SNMP traps to external systems	
Provide APIs for database access/ creating custom UI and integrate with the NMS system/to create new notification methods/to create new configuration methods/create new methods for statistical calculations/create scanners to include new devices in the standard discovery/create new poller methods	
Possess highly customizable and extendible framework	
Offers open APIs that facilitate integration with other OSS/EMS systems. API offerings span across scanning and detecting of new types of devices, detecting of new protocols or even vendor-specific protocols.	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

### 10. Technical Specifications for Help Desk System

Service Desk	Compliance (Y/N)
<b>General Requirement</b>	
Solution should be ITILv3 compliant	
Solution should be process driven	
Provide dashboards to display lists, charts and gauges	
Provide Web Interface for users, support staff and customers	
Support for multi customer or groups	
Provide powerful connectivity to other data sources for data import	
Provide Out of the box configuration aligned with ITIL for rapid deployment	
Role based Administration	
Provide customizable interface ( Window or Views and Process)	
Provide email interaction for logging and updating Incident, Service Request, etc.	
Should provide mail to Incident. Customer can mail to service desk operator/ Engineer, that mail can automatically be converted into an incident.	

To ensure high level of data exchange between different modules of Desktop Management and provide seamless integration between Helpdesk and Desktop Management tools – the Asset Management, Software Delivery and Remote Control modules should essentially share the same database.	
The service desk should be from the same product family as the EMS and should be compliant with ITIL standards. It should be integrated feature	
System should be able to provide Email, SMS Notifications	
System should be Multi-tenant in architecture	
System should support REST APIs to integrate with 3rd party systems	
System should be single page application	
<b>Incident Management</b>	
Incident records can be created and changed	
Each incident record has an unique ID	
Time and date will be automatically recorded in the incident record	
Incident records are separated from problem and change request records	
Incident records can be classified according to priority and category	
Incident records contain status information	
Incident records can be linked to Customer/User Information	
Incident records can be linked to configuration items	
Incident records can be linked to the caller	
Incident records can be linked to and routed to support partners	
Incident records can be associated to problem records , Change Records	
Incidents are monitored and tracked against tolerance breach	
Escalation Matrix can be define dynamically for each Incident	
Automatic Incident logging through Event management based on pre-defined rules	
Incident can be linked to another Incident, Parent child relation between Incidents can be able to defined	
Support for notification and escalation on tolerance breach	
Provides management information about the process	
Able to provide predefined templates for easy logging of incidents and change requests.	
Able to provide a partition able knowledge base for both internal and external access by analysts and users	
Able to provide self-service to users to log and update incidents	
Able to provide automatic notification of new, updated, assigned and closed incidents to either/both analyst and user	
Dynamic column can be added to define input fields, It should include the Group Dropdown Hierarchy (If the Value of one drop down changes, other dropdown value should be filtered), the value also can be uploaded through CSV, Access should be provided dynamically on the newly defined columns	
Able to provide a knowledge base with predefined content for commonly used applications, e.g. MS Office	
Knowledge base must be searchable through natural language as well as expressions	
Must be customizable to include additional information that is required to be logged against incidents e.g. first contact closure	
Have a predefined out-of-the-box process for incident management that is compliant with best practice frameworks such as ITIL	
Able to attach a customizable process to incident management	
Able to search similar related incidents that have been previously logged in the system	

Able to have multiple assignments to various groups and analysts	
Able to attach documents to the incident to aid troubleshooting. E.g. error screen shot.	
Able to attach subsequent tasks and notes to the main incident.	
It should have the ability to track work history of calls to facilitate troubleshooting.	
Should be able to create task with in incident to take help from other team members or 3rd party vendors	
It should support tracking of SLA (service level agreements) for call requests within the helpdesk through service types.	
Should be able to define dynamic workflows and process	
Should be able to define dynamic teams, Notification templates	
Allows customization of the workflow to align to business requirement	
Auto assigned incident to the support staff based on pre-defined rules	
Closure category & comments fields should be provided	
It should provide provision for customer surveys to assess their service experience.	
System should support auto assignment of Incident, should consider auto assignment based on shifts, Load, Leave, services etc.	
System should support the Incident Management for Franchise/ 3rd Party vendors	
<b>Knowledgebase Management</b>	
Knowledgebase Management should be integrated with the EMS system	
Have a powerful knowledge management functionality	
Role based, Team Based, User Based Access control on KB articles/FAQ/Information/KE/Solutions etc.	
In FAQ/Solutions type of knowledge , system should allow to add multiple questions/multiple solutions with single knowledge article	
Able to promote knowledge to analysts (Service Desk) and end users (Service Portal)	
Able to suggest advice as Incident, call, processes are being entered	
Provide fully configurable results display	
Able to add knowledge articles Able unlimited searchable fields	
Provide process driven to ensure compliance and quality of knowledge base	
Able automatically capture knowledge from Incidents, Problems, Changes and other processes	
Able provide Dynamic searching from other application areas	
Provide KCS (knowledge centered solutions) compliant	
Save new resolutions created by technicians	
Knowledgebase suggests solutions	
Automatic search of knowledge base	
Should be able to attach files with knowledge articles	
Full text search, Keyword search	
Natural language queries of knowledge base	
List of Common Problems	
Bulletin Board/Hot News	
Browsing knowledgebase without creating incident or problem	
Browse resolutions based on topics	
Web access to knowledge base	
<b>Service Level Management (Service Desk)</b>	
Facilitates the creation and management of an IT service catalog	
Facilitates the development of custom SLA structures	



Service level agreements (SLA) records can be created, changed and deleted	
Able to create Business Hours, Non Critical Business Hours, Non Business Hours, 24x7 SLA, It should support Round the clock SLA Management	
Response time and availability criteria shall be used to determine key thresholds; that managers and technicians can monitor and respond to SLA-based tasks appropriately.	
SLA records contain information on IT provider and customer, services, service levels, etc..	
Multiple escalation points can be created as threshold of the response time	
Able to sort the workload based on the priority of the incident or process.	
Able to send notifications when escalation of the SLA is breached	
Able to automatically assign Incident, Task or Process to other user, group or role when escalation is breached	
Service level agreement records can be linked to incidents, Problem and changes.	
Service level agreement records can be linked to tools for monitoring, measuring and registration of the performance of IT provided services	
<b>Service Catalogue</b>	
System should allow to create service categories, product categories etc.	
System should allow to create service hierarchy	
Should be able to define the workflow to be to deliver the service	
User access control on the service	
Should be able to define SLA to be used per customer basis, should be able to offer different SLA to different customer or same SLA to multiple customer	
Should be able to define the service classifications	
<b>CMDB</b>	
System should allow to add multiple CMDB classes dynamic	
System should allow to create dynamic Item types	
System should allow to create dynamic input custom forms for each Item type	
Able to manage Annual Maintenance Contract (AMC) vendors	
System should allow to create dynamic input custom forms for each Item type	
Should be able to add Items for each Item Type	
Able to manage procurement details for each Items	
Provide summaries based on total number of server, network equipments, OS, Vendor summary etc.	
Provide Expiry notification for AMC dates.	
Should be able to integrate with Customers, Incidents, vendors, Locations	
Should be able to create the relationship with other Item types	
System should support 3rd party Vendors or Franchise Management	
<b>Reports and Dashboards</b>	
Able to allow changing/customization of fields and time interval	
Able to export file in the format of PDF, CSV and Word	
Able to provide standard KPI reports	
Provides SLA reports	
Provide multiple type of graphs, matrix report	
report wizard should allow to add SQL stype report consideration Group by, Order by, Filters etc.	
Private Report features should be available and the visibility should be able to control based on user & Role	
Auto/Schedule report features should be available	

Dashboard should be available based on user role	
Provide easy mechanism to change the graph type for easy comparison	
Provide a set of sample report for the user	
Provide a easy method to reuse an existing report , modify it and save it to a new report	
Provide a mechanism to send reports to specific portal users	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>	

### 11. Technical Specification for Asset and Patch Management

<b>Enterprise System Lifecycle Management</b>	<b>Compliance (Y/N)</b>
<b>Basic Requirements</b>	
Solution should be Hardware appliance or virtual appliance based, plug & play system	
Solution should be web based, open, distributed, scalable, open to third party integration.	
Tool should support multi OS Client Management , It should be able to manage atleast Windows 2003,WinXP,Win7, Win Vista, Win2008/R2,Win 8.1, Win 10, Win 2012 or any new version of windows, RHEL 4.x Onwards, SUSE, Ubuntu, MAC OS X 10.4 onwards, Chrome OS, Unix, Network Devices etc.	
Solution should support All the major multi vendor Endpoints i.e Laptop, Desktop, Servers, Thin Clients, Virtual Machines, Chrome box, Network Devices etc.	
Solution should support Agent Based and Agentless Asset Management	
Tool should have multiple browser support, so that user can access it from any of the browser, it should have support for all major browsers like IE, Chrome, Mozilla, Safari etc.	
The proposed solution should provide end-to-end, comprehensive, modular and integrated management of IT infrastructure components.	
Tool should provide multiple AD/LDAP Server integration support for single sign on	
Tool should provide Multiple Organization support, so that assets can be managed in to distributed and centralized manner.	
Organization Management feature to provide multi-tenancy, multiple department/Multi location assets can be managed from centralize location	
There should be a reference on premise installation for more than 10,000 Nodes/System across multiple regions, multiple location in India.	
System should support auto maintenance feature, if anything goes wrong, system should be able to recover by itself	
Proposed solution must have online community such as Blogs, Forums, Technical Discussion Groups to allow administrator to participate and learn	
Proposed solution must facilitate online training to allow administrator perform on-going technical skill re-learn or update anytime, anywhere without additional cost	
Proposed solution must have documentation and user manual written in English and published online	
Proposed solution must have single point of contact for Software and Hardware related issue	
Anywhere, anytime, any device access for both administrators and end users the mobile app support	
<b>Simple &amp; Secure Administration</b>	

Solution must provide web-based administration via any device (PC, tablet, handheld) using a supported web browser	
Solution must provide native Mobile App that allow users or administrator to connect using mobile device running on Android or IOS	
Solution must provide multi tenancy functions to allow remote site's administrator to view and manage their own device within organization and also facilitate super admin to be able to view and manage all connected devices	
Solution must use secured transmission protocols like Secure Shell (SSH) version 2, Secure File Transfer Protocol (SFTP) and HTTPS are used for all scoped system's maintenance and administration connectivity purposes	
Solution must provide authentication, permissions and administrative rights management through role-based management with read, write and hidden access	
Solution must be able to work with networking customization such as routing tables and subnet access control list	
Solution must support Real-time LDAP or Active Directory integration with incorporating of LDAP groups for labels	
Solution must provide Wake-on-LAN capabilities for after-hours maintenance	
Solution must provide One-click software upgrades	
Solution must be able to Integrate with remote access software to control computer clients remotely to allow administrators to shutdown, restart, hibernate, lock computers	
Solution must use 2048-bit encrypted communication across all protocols and file transmissions	
Solution must provide usage of MD5 checksums for file transmissions and integrity validation	
Solution must provide auditing and tracking of key administration activities by providing logs with time and owner	
<b>IT Inventory &amp; Asset Management</b>	
Solution must provide device network discovery and inventory of all hardware and software connected to your network, including computers, servers, and non-computing network devices. The support platform must include, but not limited to Windows, Mac, Linux, Chrome OS and etc.	
Solution must allow administrator to define custom inventory field and allow custom information to be stored. Custom information is either scan from system or manually input by administrator	
Solution must be able to track asset history from inception to retirement including such details as day to day changes, manual edits and changes to linked assets	
Provides diverse range of asset type customization such as text, number, date, timestamp, currency, multi-select, users etc.	
Solution database must NOT locked down and must be able to access directly by administrator using any ODBC tools for reporting purpose	
It should support Agentless & Agent based Inventory Management	
Solution must support following Windows platforms: Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10	
Solution must support following Mac platforms: OSX 10.6, 10.7, 10.8, 10.9, 10.10, 10.11	
Solution must support following Linux platforms: CentOS, Debian, Fedora, Oracle Enterprise Linux, Red Hat, SUSE, and Ubuntu	
It should have inbuilt agent push tool , so that agent can be pushed by accessing browser itself, It should support AD/LDAP group policy also to push the agents.	
Solution must support the following UNIX platforms: AIX, FreeBSD, HP-UX, Solaris	

Agent installation must be independent software that cannot rely on third party software or plug-ins and has a small footprint which does not impact the system performance	
Agent inventory collection must not be affected by corrupt or restricted access to required data	
Must be able to collect detailed system information without dependency of installed software from vendor	
Solution must provide network discovery and inventory of systems without the requirement of installed software or third party assistance	
Discovery of installed software and services for inventory reporting without the need for vendor installed software or third party assistance	
Solution must support data collection of undiscovered operating systems for the purposes of inventory or asset tracking without the requirement of vendor installed software or third party assistance	
Software metering - monitors and collects software license and usage of every user and devices	
Metering must be done through in-house database not dependent on data collected from environment for the purposes of tracking software usage	
It should fetch the warranty information & the service tag automatically for at least one of the Hardware OEM (i.e Dell, Lenovo, HP, Acer etc.)(Desktop, Laptop, Server) and for other OEM it should be able to manage warranty manually al well.	
It should provide detailed Software inventory , which should include all the installed OS, Software, Services, Startup programs, Process, Patches , Licenses etc.	
Should be able to assign software threat levels to software items	
It should provide inbuilt software catalogue for the provided software , which will help in auto categorization, uncatalogued software, and License Management	
It should provide feature for software metering along with the user usability report of the metered software	
It should have black listing and white listing of the software available from software catalogue, so that admin can control the software	
It should be able to manage the license keys for most windows,MS Office, adobe and other common software	
It should provide the License compliance management, should be able to categorize & track all the licenses used by users, License Expiry tracking, Compliance breach notification, financial tracking etc.	
It should be able to track all the changes happening in hardware and software inventory	
Asset Management should provide option to define asset classes/asset type and the dynamic input form to record the Non discovered assets	
Asset should be linked between other assets, it should be linked with the discovered Inventory clients and Users	
It should have facility to create dynamic rule based smart labels, these smart labels will be based on the Inventory & asset parameters to provide dynamic filtering and logical group creation.	
Multiple smart labels can be applied to one asset and it should be automatic based on smart label rule.	
If assets or User moves, then based on rule the labels should also change automatically, it will help in auto managing the assets	
Allow administrators to deploy custom scripts to detect required Hardware / Software information and Integrate it with the system	
Allow administrators to edit registry entries of selected nodes via the central console	

Manage items throughout their lifecycle. Track software and other items from procurement to deployment, usage, and end of life. Or, track peripherals such as printers, network devices, and phones	
Track purchase orders (POs) by entering each PO as an asset and linking it to the items purchased, received, and distributed	
Should be able to track Non IT assets , there should not be additional license for it, it should support unlimited numbers of non IT, Non IP assets.	
Create and track relationships between assets. Create peer-to-peer and parent-child relationships between assets.	
Should be able to import Assets belongs to different asset classes from 3rd party system	
Should be able to create user defined custom views, based on business rules	
Should be able to create notifications on the assets	
Each and every asset should have integration with ticket system	
While browsing asset detail (IT/Non IT) admin should be able to see corresponding tickets, it will help to check the life cycle of the assets.	
Solution should be able to capture Network device Inventory using SNMP	
<b>Software Distribution</b>	
Should allow administrators to distribute 3rd party software, it should allow process driven software distribution	
Administrator should be able to create multiple replication site and system should allow to distribute software to remote replication site	
Replication should support asynchronous mode of software distribution	
Replication should have Bandwidth management chart to configure bandwidth usage for 24x7 , and allow bandwidth throttling configuration	
Should be able to track complete history of replication activities, should provide feature to Start, Stop, Halt & Interrupt current replication task	
It should allow software installation, uninstallation from centralize console, both interactive & silent installation	
It should allow software installation, uninstallation from Windows, Linux, Mac platform	
It should allow dependent & procedural installation	
Installation can be done to selective nodes or all nodes or label based	
Should allow the order of installation, Snoozing, Pre Installation , Post Installation Message, Max attempts configuration	
Should be able to track complete history of managed installation	
Should provide Wake - On - LAN feature	
<b>Patch Management</b>	
Should be able to subscribe & download the OS security, non-security patches	
Should be able to subscribe & download 3rd party application patches, Antivirus patches	
Should be able to automate complete patch management process	
Should provide the listing of the patches, detail, severity , impact & other detail about of patches	
Should be able to detect, deploy missing patches	
Should be able to Group & provide Labels to the group of patches based on the rules	
Should provide facility to detect & roll back of the patches. It should also have feature to roll back the patches belongs to particular Labels	
Admin can apply patch action policy to all the nodes, selective nodes, of groups of nodes	
Should be able to control Reboot required by patches	
Should be able to Snooze, Pre installation Message, post installation message	
Should be able to schedule patch download, detect, deploy, rollback of the patches	

Should be able to track complete history of patch progress	
Should be able to configure & Run unlimited patching tasks	
Should support offline patching	
Should allow Vulnerability Assessment Test/OVAL Test for windows machines	
It should support automatic management of the Firmware/BIOS/Driver upgrade for atleast any one of the popular Hardware vendors (i.e Dell, HP,Lenovo,Acer etc.)	
<b>Scripting &amp; Policies Management</b>	
Inbuilt wizard based configuration for remote registry policy deployment	
Should provide remote desktop management and should integrate with RDP, VNC, Bomgar, DameWare, Telnet, SSH etc	
Inbuilt configuration policy for desktop settings	
Inbuilt configuration policy for power management	
Inbuilt configuration policy for AD configuration	
Inbuilt security policy configuration for IE, Firewall settings	
Inbuilt policy to set up antivirus like Symantec or McAfee settings	
Inbuilt Quarantine Policy, in case of security breach	
Inbuilt disk defragmentation policy	
Inbuilt USB control up to driver level	
Should be able to deploy & monitor custom scripts	
Should be able to create dependent scripts and run the scripts after dependency execution	
Should be able to configure multiple job rules like File or directory exist, or Process running, not running, kill the process or launch the program,unzip file, search file system	
Should be able to deploy the script to all, selective nodes or groups of nodes.	
Should be able to Schedule the scripts	
Should allow Offline scripting	
Should be able to run, track/monitor the current running scripts	
Provisioning configuration for vPro machines	
<b>Notifications/Alerts</b>	
Able to send alert happened via E-mail, Pop-up window	
Notification should be available for all the modules like Software, Hardware inventory, License, Asset, Changes, Patching, Software Management, Scripting , Helpdesk, Process Automation etc.	
<b>Reporting</b>	
Able to allow changing/customization of fields and time interval	
Should provide wizard based, drag and drop based report configuration	
Should support SQL Based reporting	
Predefined reports should be available in the system to track Hardware, Software Inventory, Track Life cycle of the asset, changes, history, Software distribution, Power Management, Patch Reports, Policies Report, Helpdesk reports etc.	
Reports can be user configurable for all the modules like Inventory, Computer, Asset, Patch, Helpdesk etc.	
Should be able to schedule the reports, the generated report can be delivered to the provided mailbox automatically.	
Able to export file in the format of PDF, CSV, XLS,TXT and HTML	
Should be able to filter the reports	
It should have option to create customized views based on filters	

**Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.**

## 12. Technical Specifications for Backup Solution

No	Requirements	Compliance (Yes/No)
	<b>Backup Management Software</b>	
1	All backup/restore administration must be controlled by a centralized master system	
2	The master system must support Windows & Linux	
3	Master system must maintain a database for all backup/restore meta-data <ul style="list-style-type: none"> <li>a. Comprehensive reactive database format.</li> <li>b. Easy to reconstruct against in the unlikely event of corruption.</li> <li>c. Easily protected with an integrated backup and recovery plugin for the database</li> <li>d. Bare Metal Recovery option for the Backup Master system.</li> </ul>	
4	Supported client systems include: Windows, Linux and Mac OS X Platforms	
5	Should be able to manage all master systems from different locations	
6	The software must be based on Graphical User Interface (GUI) so that all backup servers can be managed centrally, regardless of location	
7	The tape format should be open standard MTF for Windows , and CPIO for Unix /Linux for portability and independence.	
8	The software must provide flexibility to backup to different media. These include disk-to-tape, disk-to-disk and interoperability.	
9	The software should be able to automatically duplicate or migrate data from disk to alternative target backup media to prepare for offsite storage	
10	The software should be able to restore from alternative media without restaging through the disk.	
11	The software must have the ability to perform disk-to-disk backup via iSCSI or FC SAN in sharing mode	
12	The proposed backup solution must be able to support raw device backup – on both Windows, Linux and Unix (IBM AIX, Sun Solaris & HP UX)	
13	The proposed backup solution must be able to support consolidated (synthetic) backup – for file system data on all platforms.	
14	The proposed backup solution must be able to encrypt backup data at source – and store with 128-bit or 256 bit encryption with an option to encrypt data while performing duplicate backup jobs from disk to tape.	
15	The proposed backup solution must have user level access control list security function. Each user has different permissions and privileges on the system.	
16	The proposed backup solution should be modular in architecture, allowing for components to be added and removed without requiring the backup system to be shutdown.	
17	Scalable, distributed architecture of Master Server, Media Server and Client, enabling high-performance backup to direct-attached devices or SAN-attached devices without scripting.	
18	Shows real-time backup progress bar.	
19	Feature for reporting on tape utilization, and drive configuration.	

20	Systematic, menu-driven procedures for restoring data to alternate paths or systems to simplify disaster recovery and recovery simulation.	
21	Automatic robotic/tape drive configuration. No scripting required.	
22	Allows multiple heterogeneous servers to be attached to the SAN switch and these servers can dynamically share tape and disk devices in a SAN environment.	
23	Logging information is filterable and can be output into text, HTML, or spreadsheet-usable formats to facilitate the creation of graph and pie chart to enhance the report for storage resource planning.	
24	Ability to configure automated backups for specific days and weeks within a month, while maintaining a simplified methodology for complex date scenarios.	
25	Full backup and restoration capabilities management from remote location.	
26	Network bandwidth compression for management of network utilization to reduce loads when backup occurs during production time.	
27	Support for leading connectivity protocols :- a. SAN iSCSI / FC b. NAS c. Ethernet Technologies 100/1000/10000 BaseT	
28	Must be capable of “block level” backups for Bare Metal Recovery of Physical servers	
29	Should have specific agents to perform “hot” backups on the following databases and applications such as: a) oracle on Windows/Linux b) Informix on windows/Linux c) Sybase on windows/Linux d) DB2 on windows/Linux e) MS SQL on window f) MySQL on Linux and Windows g) Postgres SQL on Linux and Windows h) Ms Exchange on Windows i) Lotus Notes in Windows/Linux	
30	Should support server independent restore	
31	Must be able to report tape utilization and view drive configuration in multiple views.	
32	Should have reporting capabilities a. Full job completion report. Overview of the full backup jobs that were successful, partially successful and failed for each day b. Full backup data volume report. Overview of the total data volumes that were backed up for each day c. Average tape utilization report. Listing of the average amount of data stored on each media l Storage performance report. Average data throughput	
33	Should meet the following Media Management capabilities a. Allow tape library sharing among media servers b. Allow individual tape drive sharing among media servers and allow for reconfiguration without rebooting media servers Tape drive sharing must support both iSCSI and Fiber based connections.	
34	The software should be capable of performing latent restores on Windows systems.	
35	The software inbuilt reporting tool must has the ability to create customize reports without any additional purchase of another reporting module or 3 <sup>rd</sup> party reporting module	



36	Tape media scanning should be quick and easy to perform to rebuild a lost index or re-import a tape with older backup data.	
37	Backup Index /file catalogue should be able to be taken offline and then compressed.	
38	The software must have the ability to provide disaster recovery of Window and Linux operating systems by use of a bare metal recovery technology.	
39	The disaster recovery tool must allow backup of source (Server A) and restore to target server ( Server B) on window and Linux systems.	
40	The size of index or catalogue file must be less than 100 bytes per files/folder/directories that are being backed up.	
41	Able to compress the index files automatically or by policy.	
42	Able to import/scan the indexes using GUI without having to resort to the use of CLI operations.	
43	Ability to integrate with storage NAS snapshot based protection mechanisms by providing control GUI module	
44	Ability to support and manage snap shot based backup, and file based backup “ under one roof “ while maintaining granular file level recovery.	
45	Must support storage protocols such NDMP (version 3 & above). Please provide interoperability matrix with storage appliance firmware/OS release compliance. Specify specific features advantages aligned with the storage vendors	
46	Must be able to utilize Direct Access Restore for NDMP technologies to facilitate single file level restore.	
47	Capable of providing Check –Point Restart for NDMP backup	
48	Support for server virtualization especially VMWare & Hyper-V	
49	Must be integrated with VMware VADP with D2D2T layout. Must be synchronized with VMware VADP for data integrity.	
50	Allows full VMware VADP backup by utilizing LAN, SAN and Hot Add advanced transport mechanisms to optimize data transfer of virtual machine backups.	
51	Must support virtual machine backup online and supports file level VADP backups for virtual machines running Windows.	
52	<p>Must support the following VMware Features for Backup &amp; Restore:</p> <ol style="list-style-type: none"> <li>a. Supports VADP-based online backups</li> <li>b. Creates VSS-based snapshots for application-consistent backups</li> <li>c. Allows CBT-based Full, Incremental, and Differential image-level backups of virtual machines</li> <li>d. Supports backup and restore of Thin Provisioned Disks</li> <li>e. Enables backup and restore of virtual machines within a Virtual Application (vApp)</li> <li>f. Supports Storage vMotion using the vSphere virtual machine locking API</li> <li>g. Reduces backup windows by backing up multiple virtual machines in parallel</li> <li>h. Reduces network and storage requirements for NTFS basic disks with Active Block Mapping (ABM)</li> <li>i. Allows backups and restores of individual virtual disks</li> <li>j. Allows Full, Differential, and Incremental file-level backups of Windows-based virtual machines</li> <li>k. Offers ease of use with point-and-click GUI</li> <li>l. Restores complete virtual machine images or individual files</li> <li>m. Relocates virtual machines to alternate ESX Server</li> <li>n. Allows virtual machine renaming during restore</li> </ol>	

	<ul style="list-style-type: none"> <li>o. Allows file-level restores from image-level backups</li> <li>p. Relocates individual files to alternate directory or virtual machine</li> </ul>	
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**Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.**

### 13. Technical Specification for Active Directory Management Solution

	AD Management Software Specification	Compliance Yes/No
1	Simplify and streamline daily management of Active Directory (users, groups, etc.)	
2	Automate version control and backup of Active Directory and restore objects without taking AD offline	
3	Quickly compare GPO versions and restore GPOs without taking AD offline	
4	Roll back unauthorized AD changes	
5	Confidently and securely delegate AD administration to junior admins	
6	Generate auditing reports of Active Directory activities	
7	Receive alerts of critical AD changes and health issues Save time managing Active Directory	
8	Save money and avoid downtime by quickly recovering from deployment of mistaken GPOs and AD changes	
9	Ensure security and save time by confidently delegating AD management to junior admins	
10	Ensure availability by automating the monitoring of health of Active Directory	
11	Save time by quickly generating audit reports for management or compliance officers	

**Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.**

### 14. Technical Specifications for Hardware Items –High end Servers

Sno	Component	Description	Compliance (Yes/No)
1	Processor	Intel Xeon E5-2697 v4 2.3GHz, 45M Cache, 9.60GT/s QPI, Turbo, HT, 18C/36T (145W) Max Mem 2400MHz	
2	Chipset	C610	
3	Memory	Server to be populated with 8 x 16 RDIMM DDR4, Dual Rank, x8 Data Width	
4	DIMM Slots	Up to 768GB (24 DIMM slots): 4GB/8GB/16GB/32GB DDR4	
5	Memory Property	Advanced ECC memory protection, Memory mirroring or Equivalent	
6	Drives	Up to 16 x 2.5" HDD: SAS, SATA, nearline SAS SSD: SAS, SATA Up to 8 x 3.5" HDD: SAS, SATA, nearline SAS SSD: SAS, SATA	

7	Drive capacity	8 x 600 GB 15K RPM SAS 12Gbps 2.5in Hot-plug Hard Drive	
9	RAID Controller	Integrated hardware RAID controller and should support Raid 0,1, 5 and have 512MB BBWC or Flash Cache	
	Optical Drive	DVD-ROM	
10	Graphics Controller	Minimum 8 MB Memory	
11	Ethernet Ports	4 x 1GbE, 2 x 10+2GbE, 4 x 10GbE NDC	
12	PCI Slots	Up to 7 x PCIe 3.0 plus	
13	Remote Management	<ul style="list-style-type: none"> <li>• Vendor should provide embedded features that help to manage Servers in physical, local and remote environments, operating in-band or out-of-band, with or without a systems management agent.</li> <li>• Should include Power Management, necessary licenses should be included.</li> <li>• Power Management should give historical data for atleast 72 hours.</li> <li>• Should also support IPv6</li> <li>• Should support remote scripted reconfiguration tools.</li> <li>• Should be able to monitor all systems components (BIOS, HBA's, NICs, CNA's).</li> </ul>	
14	Redundant Power Supply	<ul style="list-style-type: none"> <li>• Redundant hot swap power supplies.</li> <li>• Should be at least 92%+ efficient at 100% workload.</li> </ul>	
15	GPU capability	The server should be able to support GPU card in future.	
16	Redundant Cooling Fans	should have hot-swap redundant cooling fans. Fans should automatic adjust speeds depending on the temperature inside the server chassis	
17	Failure Alerting Mechanism	The server should be able to alert impending failures on maximum number of components. The components covered under alerting mechanism should at least include Processors, memory, PCIe slots, VRMs, power supplies, fans, hard disk drives	
18	Cluster Support	Should support High Availability Clustering	
19	Form Factor	2U	
20	Certification	Microsoft Windows 2012 R2 Enterprise Server, Windows 2012, **Any two flavors of Linux/ RHEL.	
21	Server Management	<ul style="list-style-type: none"> <li>• Smart Embedded Systems Management should be able to automate task like discovery deploy monitor and update.</li> <li>• Should not be dependent on agents to for life cycle management.</li> <li>• Should be OS Agnostic.</li> <li>• Should be able to provide Single console to manage Servers.</li> <li>• Power management tool – Single interface to optimize ad control every usage for servers and Racks.</li> <li>• Should be able to integrate to 3rd party management tools.</li> </ul>	
22	Warranty	3 years Comprehensive 24 x 7 Next business day	

23	Vitutilization.	VMware essential Plus should Include or Separate licenses for virtualization. Server in HA mode.	
24	Operating system	Windows Server 2012 R2	
25	HBA	QLogic 2562, Dual Port 8Gb Optical Fibre Channel HBA to connect storage	
26	OEM Market Share	OEM should be in leaders quadrant in latest Gartner Magic Qaudrant in X86 Server platform	
27	Rails	Must be supplied with cable management arms and rails to rack mount the server	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>			

### 15. Technical Specifications for Hardware Items – Storage

SL No	Description	Compliance
1	Operating System & Clustering Support	
	The storage array should support industry-leading Operating System platforms including: Windows Server 2008, Windows server 2012, VM ware, and Linux.	
2	Capacity & Scalability:	
	The Storage Array shall be offered with 15 TB usable capacity after RAID 5 and Raid 10 using 1,2 TB SFF SAS disks.	
3	Cache:	
4	Offered Storage Array shall be given with Minimum of 8 GB cache in a single Controller	
5	Offered storage architecture shall be with Dual Controllers.	
6	No Single point of Failure	
	Offered Storage Array shall be configured in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.	
7	Disk Drive Support:	
	Offered Storage Array shall support 6Gbps dual-ported SAS/SSD/NL_SAS Drives	
8	Raid Support & Virtualization	
	1. Offered Storage Subsystem shall support Raid- 5 , 6, 10	
	2. Offered storage array shall have native virtualization support so that Raid 5 & Raid 10 can be carved out from a logical space instead of dedicating separate physical disks for each application.	
	3. Every supplied disk shall be able to participate into multiple and different raid sets simultaneously.	
	In case vendor doesn't have above functionality, then 50% additional Usable capacity shall be provided for each type of disk to balance out the capacity utilization.	
9	Host Ports & Back-end Ports	
	Offered Storage shall have minimum of 8FC for connectivity to servers running at 8 Gbps speed.	

10	Global Hot Spare	
	Offered Storage Array shall support distributed Global hot Spare for offered Disk drives.	
	Global hot spare shall be configured as per industry practice.	
11	Monitoring	
	1. Storage shall be provided with Performance Management Software.	
12	Thin Provisioning	
	Offered storage array shall be supplied with Thin provisioning	
13	Maintenance Offered storage shall support online non-disruptive firmware upgrade for both Controller and disk drives.	
14	Snapshot	
	The storage array should have support for controller-based snapshots functionality for pointer-based snapshots (At-least 500 copies),	
15	Storage Array Configuration & Management Software	
	Vendor shall provide Storage Array configuration and Management software.	
16	Storage Tiering	
	1, Offer Storage shall support Dynamic Data movement(Tiering) form one RAID set to another RAID set while keeping the application online	
17	Remote Replication	
	The storage array should support hardware based data replication at the array controller level	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

### 16. Technical Specification for Office Printer

Type	Colour Laser Multifunctional Device (Reader/Printer Desktop)		Compliance (Y/N)
Paper Sizes	Cassette 1:	A4, B5, A5, Custom size (139.7 x 182mm to 297 x 215.9mm)	
	Cassette 2:	A3, B4, A4, A4R, B5, B5R, A5R, FLS, F4A and Custom size (139.7 x 182mm to 304.8 x 457.2mm) and Envelopes (COM10 No.10, Monarch,DL)	
	Multi Purpose Tray:	A3, B4, A4, A4R, B5, B5R, A5, A5R, FLS, F4A Custom size (98.4 x 139.7mm to 320 x 457.2mm) and Envelopes (COM10 No.10, Monarch,DL,ISO-C5)	
Resolution	Scan:	600 x 600dpi	
	Copy:	600 x 600dpi	
	Print:	1200 x 1200dpi	
Copy / Print Speed	A4:	25/25ppm	
	A3:	15/15ppm	
Warm-Up Time	From Power On w/o Quick Startup:	34 seconds or less	

	From Power On w/Quick Startup:	10 seconds or less	
	From Sleep Mode:	10 seconds or less	
Multiple Copies / Prints	1 to 999 copies		
Magnification	Copy Ratio:	25 - 400%	
Paper Weight	Cassette:	52 to 220gsm	
	Multi-Purpose Tray:	52 to 256gsm	
Paper Capacity	Cassette 1, 2:	550 sheets x 2 cassettes (80gsm)	
	Multi-Purpose Tray:	100 sheets (80gsm)	
CPU	1.66GHz		
Memory	2GB RAM		
Hard Disk Drive	250 GB		
Interface	Network:	Ethernet 10Base-T / 100Base-TX / 1000Base-T (RJ-45)	
	Others:	USB 2.0 x 2 (Host), USB 2.0 (Device)	
Power Supply	220-240V AC, 50 / 60Hz, 4.0A		
Power Consumption	Max.:	1.5kW or less	
Drum Yield	Black:	75,000	
	Colour - Y,M,C:	50,000	
Supported OS	PCL:	Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10, Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2	
	Adobe PostScript 3:	Windows 7, Windows 8, Windows 10, Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, Mac OS X 10.5.8 and later	
Network Protocol	TCP/IP (LPD / Raw / IPP / IPPS / FTP /WSD / SMB), IPv6, AppleTalk		
Scan Speed (A4, 300 dpi)	Black & White / Colour: 55/55 ipm		
Scan Resolution	100 x 100dpi, 150 x 150dpi, 200 x 100dpi, 200 x 200dpi, 200 x 400dpi, 300 x 300dpi, 400 x 400dpi, 600 x 600dpi		
Destinations	Email / Internet FAX (SMTP), PC (SMB, FTP), iWDM, WebDAV		
Address Book	LDAP, Local (Max. 1800)		
File Format	TIFF, JPEG, PDF, XPS, Compact PDF/XPS, PDF/A-1b, Optimize PDF for Web		

**Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.**

### 17. Technical Specification for Intelligent Jack/Patch Panel

SN	Specification	Requirement	Compliance(Y/N)
1.	Connector Type	RJ45	
2.	Hardware Compatibility	Compatible with RJ45, CAT 6E STP type Compatible with 19 inches Telecom racks	
3.	Ports	Minimum number of ports shall be 24	
4.	Compatibility	Compatible for FTTH/FTTB/CATV, Enterprise Network: POLS, Access Network : Network-Data Center, Enterprise Network: Structure Cabling	

### 18. Technical Specification for Video Conferencing System

SN	Specification	Requirement	Compliance (Y/N)
1	<b>VIDEO</b>	<b>Amended specifications proposed by BOO</b>	
1.1	Signal system	The system should support PAL and should be a point-to-point system with codec, Full High Definition 1080p or better camera with a minimum of 10xzoom, MIC, remote control, cable and power supply.	
1.2	Standards and protocol	H.263, H.264 or better. Encrypted Call should be possible. should be possible when sending or receiving two live video sources e.g. Presenter and Presentation.	
1.3	Resolution	The system should support video resolution from 4CIF (Common Intermediate format), VGA, SVGA, 720P, 1080p @30fps. The PC resolution should be 1080P or better	
1.4	Frame rate	Minimum 30 fps.	
1.5	Band width	Upto 4Mbps point to point on IP	
1.6	Video Inputs	The system should have 2 Video Inputs to connect 1XHD camera and 1 for PC DVI (Digital Video Interface)	
1.7	Video outputs	The system should have 2 video outputs 2XHDMI (High-Definition Multimedia Interface)/DVI for connecting two HD displays:DVI or better. It should be possible to display the main video on one HD screen and the presentation / dual video on the other HD screen.	
1.8	Picture in Picture	Should support picture in picture (PIP)	
2	<b>AUDIO</b>		
2.1	Standards and protocol	G.711,G.722,G.722.1, 64 kbps MPEG-4 AAC-LD or equivalent standards or better shall be supported	

2.2	Features	CD-Quality audio or Equivalent or Higher Instant Adaptation Echo Cancellation or Equivalent or Higher Automatic Gain control (AGC) or Equivalent or Higher Automatic Noise suppression (ANS) or Equivalent or Higher	
2.3	Audio Inputs	The system should have 2 Audio inputs (2XRCA Phone connectors ) or Equivalent or Higher	
2.4	Audio outputs	The system should have 2XRCA Phone or Equivalent or Higher	
2.5	Lip synchronization	Active Lip Synchronization or Equivalent or Higher	
<b>3</b>	<b>NETWORK</b>		
3.1	Features	The system should support IPv4 & IPv6 The system should have features such as QoS / RSVP Standards or equivalent or higher , Packet loss based down speeding TCP/IP, DHCP (Dynamic Host Configuration Protocol), Auto Gatekeeper discovery, Dynamic Layout/lip sync buffering, DTMF (Dual tone multi frequency signaling tone, Date and Time.	
3.2	ITU-T standard	DUAL STREAM:- The system should have capability to support H.239 in both H,323 and SIP mode	
3.3	Network Protocols	The system should have H.323 and SIP capability and interface as minimum .	
3.4	Interfaces	1 LAN / Ethernet - 10/100/1000 Mbps full duplex	
<b>4</b>	<b>CAMERA</b>		
4.1	Image sensor	1/3 CCD / CMOS or better	
4.2	Pan	+/- 75° or more	
4.3	Tilt	+ 10° /- 15 ° or more.	
4.4	Focus	Automatic/ Manual	
4.5	Total field of view	250° or better'	
4.6	Horizontal view angle	65 ° or better	
4.7	Zoom ratio	10x Zoom optical or better	
4.8	Remote Control	IR/ Wireless	
4.9	Microphone	2 x 360° voice pickup microphone or better	
4.10	Administration	The administration of the Video endpoint should be through Web interface using HTTPS/HTTP (Hyper Text Transfer Protocol Secure).	
<b>5</b>	<b>MULTI CONFERENCING UNIT (MCU)</b>		
5.1	Dimension	The MCU must be provided with all the necessary accessories to integrate system in 19” Industrial Rack.	
5.2	Capacity	N ports@ 4Mbps with HD 1080p @ Min 30 fps or better resolution should be supported on the same chassis/module without cascading with rate matching. The maximum number of ports upgradeable/scalable upto 48 ports. (Note	



		- Port capacity “N” to be decided by user department as per there requirement )	
5.3		Optional: The MCU should additionally support with a minimum of ‘ N’ Audio only participants. (Note - “N” to be decided by user department)	
5.4		The MCU should be accompanied with external / internal 2 PRI- ISDN gateway on same chassis or different chassis, Flexible design enables streamlined traffic flow and mass scale for converged IP Networks. (User department can extend the scalability to N PRI internal/external depending upon their requirement. Where N is to be decided by user)	
5.5		The system should 1080p in continuous presence.	
5.6		The MCU must support 2 nos of 10/100/1000 Mbps Ethernet.	
6	Audio support	Audio Codecs G.711, G.722 G.722.1 of better	
7	Video support	Video codec H.263, H.264 or better	
8	Gatekeeper	MCU shall support an embedded/external Gatekeeper for minimum 100 registrations and 50 concurrent calls. 50/100 Management, address book and scheduling tool should have capability to manage minimum 100 devices. MCU shall have the capability to connect the PC/laptop for presentation sharing over LAN/IP network	
9	No of Conferences	MCU should support multiple conferences as per the virtual MCU port capacity with flexible resource Capacity by using N ports. Conferencing highlights personnel layout, auto layout, border for active, speaker indication, lecture and presenting mode, conference profiles.	
10	Continuous presence view	MCU should support 16 Continuous Presence (CP) or better on a single screen.	
11	Interactive keypad	MCU shall have a built- in auto- attendant/ IVR from whom users can select conferences to join or start a new conference. This shall be operated using either DTMF or' FECC (For End and Camera Control).	
12	Dynamic CP layout	The MCU should support dynamic layouts wherein layout should adjust based on the participants joining the calls. MCU shall support Automatic down speeding and packet error loss concealment methods to ensure optimum video, and audio quality. The MCU must provide standards based on method of compensating and correcting for packet loss of media streams.	
13	Chairperson view	It should have chairperson / Administrator view.	
14	Far End Camera Control (FECC) and Volume Control	It should be possible to control far end camera.	

15	H-239 Support	The MCU shall support H.239 ( Sharing content through Video Conferencing).
16	Dial-out capability	Should dial out automatically to all participants, retry dial out conferences to complete call setup and should report specific failures. MCU shall support dual video H.239 and ability to send content also.
17	Dial-in Capability	Should offer robust software driven dial-in and/or dial out capability. MCU shall have in built /external capability to support PC based desktop clients for 12 PC users or more.
18	Security	The MCU should support one level or more of conference password-Chair Person and Participant password.
19	Other Features	<ul style="list-style-type: none"> <li>i. MCU shall provide HD quality in continuous presence to all HD (1080p) endpoints connected and deliver this even if SD or HD end points or port of the conference. The solution shall support standard definition, and high definition in both voices activated and continuous presence mode without loss of functionality or capacity.</li> <li>ii. MCU shall support communication up to 4 Mbps per port using both H.263 and H.264 video</li> <li>iii. MCU shall support conferences that permanently exist but use no resources/port if no. Participants are in the conference. The functionality gives end user the flexibility to Directly join the conference without having to depend or wait for the system administrator/operator.</li> <li>iv. The MCU must support ability to terminate two different non-routable networks, so that video calls from either network can be connected into a single conference without compromising on the security.</li> <li>v. MCU shall provide a built- in web Interface, for configuration and administration.</li> <li>vi. MCU shall support 2 access level/user privileges from administrator to simple guest.</li> <li>vii. MCU shall have a built- in/external address book and built in/ external scheduling.</li> <li>viii. The MCU shall support scheduled conferences and ad-hoc conferencing mode at the same time for all the N ports of the system.</li> <li>ix. MCU shall support a predefined and unique PIN for each conference.</li> <li>x. MCU shall allow users to create conferences on the fly from their end points without the need of Administrator/operator.</li> <li>xi. The MCU shall support a mix of resolution in both voice activated mode and Continuous presence. Each end point shall receive at the maximum of its capacity without reducing the capacity of another.</li> <li>xii. MCU shall be capable of supporting H.323,SIP, and H.235 in the same conference. at any band with resolution.</li> </ul>

20	Centralized Recording	The MCU server either internally or externally should be able to record the ongoing conference on HD 1080P for 2 or more Simultaneously Conference.	
21	Connectivity with existing UCM. (Optional for User Department)	It should support Video Conferencing with other UCM (Unified Communication System) Port capacity can be decided by user department.	
22	Display Unit	Dimension and features of display unit may be decided by user department as per their requirement.	
<b>6</b>	<b>EXTERNAL DEVICES</b>		
6.1	Should have USB port for future usage.		
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>			

### 19. Technical Features for Email Server

SN	Requirement	Compliance(Y/N)
	<b>Minimum features required for E- Mail Server</b>	
1.	Max Mail size limitation in MB per mail - 20 MB	
2.	Max IMAP concurrent connections per IP - 20	
3.	Max POP3 concurrent connections per IP - 25	
4.	Max mails per hour - User based	
5.	No of CC / BCC per mail – 50	
6.	Action on SMTP Load – Inform	
7.	Log Debug support – Available	
8.	Mail Delivery within 1 min efficiency - 95%	
9.	Mail server performance monitoring - 24x7x365	
10	Mail processing capacity Mails/Hr - 500 .	
11	Action on Infected Network Ips - Inform	
12	Recommended Max Mail Box Size MB - 500 MB	
13	SSL for IMAP – Available	
14	POP3 Logins Per hour Per account Per IP - Unlimited	
15	SMTP AUTH ( Mails Per hour ) - 200	
16	Compatible with MS exchange server - latest edition	
17	Compatible with IMAP4	
18	Compatible with Windows Mail , Live Mail , MS Outlook etc .	
19	File formats - RFC 822/MIME, PST Files , MSG Files, MBOX etc .	
20	MS Exchange with 200 Licenses is required for emails. Server should be capable of archiving all incoming and outgoing email correspondence via the Mail Store Proxy Server (SMTP and POP3). The Mail Store Proxy Server should be available to all Mail Store Server. Bidder to design proxy server as per mail server specification to meet above said specification.	
<b>Note: In case of protocol/functionality is not available in proposed model/solution, based on open standard/protocols alternate solution may be submitted for approval with detailed justification for deviation, however intended functionality shall be achieved by approved solution.</b>		

**6.8 NMRCL Locations:**

Nagpur Metro has the following locations where the IT infrastructure has to be designed, planned, created, and maintained. The components include Active and Passive network components, connectivity within the premises and to the primary network that links to the Data Center. The bidder is required to submit a network architecture diagram defining the network topology, active and other passive components like switches, Routers, hubs, access points, etc. cabling requirements at each location and requirements at each location, e.g. enclosed area for installing a network rack, conduits for laying the cables, cooling requirements for the equipment, etc.

S. No.	Location name and address	Location type	Number of users
1.	Metro House(Civil Lines)	Head office	50
2.	Udyog Bhavan(Civil Lines)	Additional office	100
3.	Metro Bhavan New building	Headquarter Building	500
4.	SBI Building office(Civil Lines)	GC + OSO	100
5.	Interchange Station (Sitaburdi)	Station	50
6.	Depot	Depot	20
7.	CPM office	2 per corridor	20 per office
8.	Stations	37	5 users per station
9.	Data Center (DAKC, Navi Mumbai)	Data Center	Servers & Routers location

**Locations**

N-S corridor			
S. No.	Station Name	GPS Coordinate	
		latitude	longitude
Priority Section			
1.	South Airport	21° 4'44.40"N	79° 3'37.82"E
2.	New Airport	21° 3'57.21"N	79° 3'20.16"E
3.	Khapari	21° 2'49.95"N	79° 2'49.58"E
Reach 1			
4	Congress Nagar	21° 7'55.83"N	79° 4'59.91"E
5	Rahate Colony	21° 7'36.18"N	79° 4'31.55"E
6	Ajani Square	21° 7'5.76"N	79° 4'19.70"E
7	Chatrapati Square	21° 6'33.08"N	79° 4'10.71"E

8	Jaiprakash Nagar	21° 6'12.81"N	79° 4'5.35"E
9	Ujwal Nagar	21° 5'47.62"N	79° 3'59.29"E
10	Airport	21° 5'10.50"N	79° 3'49.73"E
Depot	Mihan Depot	21° 2'28.07"N	79° 2'33.09"E
RSS	Munje Chauk (Twin RSS)	21° 8'28.94"N	79° 4'57.52"E
<b>Reach 2</b>			
11	Automotive Square	21°11'15.95"N	79° 7'19.10"E
12	Nari Road	21°10'46.51"N	79° 6'38.67"E
13	Indora Chowk	21°10'25.37"N	79° 6'3.03"E
14	Kadvi Chowk	21°10'7.13"N	79° 5'32.61"E
15	Gaddi Godam Sq	21° 9'40.25"N	79° 5'0.64"E
16	Kasturchand Park	21° 9'15.29"N	79° 4'53.18"E
17	Zero Mile	21° 8'42.84"N	79° 4'50.51"E
18	Sitaburdi(Interchange)	21° 8'28.94"N	79° 4'57.52"E
<b>E-W corridor</b>			
<b>Reach 3</b>			
19	Jhansi Rani Square	21° 8'25.75"N	79° 4'38.53"E
20	Institute Of Engineers	21° 8'18.31"N	79° 4'13.76"E
21	Shankar Nagar Square	21° 8'10.04"N	79° 3'41.55"E
22	LAD Chowk	21° 7'58.12"N	79° 3'17.13"E
23	Dharampeth College	21° 7'43.53"N	79° 2'44.97"E
24	Subhash Nagar	21° 7'23.76"N	79° 2'27.88"E
25	Rachna Ring Road Jn.	21° 7'17.20"N	79° 1'45.10"E
26	Vasdev Nagar	21° 7'8.72"N	79° 1'12.86"E
27	Bansi Nagar	21° 6'56.42"N	79° 0'43.26"E
28	Lokmanya Nagar	21° 6'30.34"N	78°59'52.62"E
Depot	Hingna Depot	21° 6'6.26"N	78°59'37.91"E
OCC	Sitaburdi(Interchage)	21° 8'28.94"N	79° 4'57.52"E
<b>Reach 4</b>			
29	Prajapati Nagar	21° 9'1.33"N	79° 8'57.22"E
30	Vaishno Devi Chowk	21° 8'52.67"N	79° 8'11.49"E
31	Ambedkar Chowk	21° 8'53.88"N	79° 7'46.56"E
32	Telephone Exchange	21° 8'55.54"N	79° 7'5.18"E
33	Chittar Oli Chowk	21° 8'58.64"N	79° 6'37.46"E
34	Agarsen Chowk	21° 9'3.69"N	79° 6'9.77"E

35	Dosar Vaisya Chowk	21° 9'10.45"N	79° 5'41.88"E
36	Nagpur Railway Stn	21° 8'57.43"N	79° 5'24.48"E
37	Sitaburdi(Interchange)	21° 8'29.76"N	79° 4'59.99"E

6.9 ACCESS DATES For provision of Hardware is 30.9.2017 for Metro Bhavan

6.10 Dates for provision of FMS Services

SN	Details	Date	Remarks
1	Metro Bhavan,	From Go-live	
2	Metro house, SBI, Udyog Bhavan & CPM Offices	From Go-live	
3	Reach1	From date of taking over from N1TL01 Contractor	If date of handing over is delayed FMS for the respective reach will advance accordingly
4	Reach3		
5	Reach2		
6	Reach4		