Sl. No.	Item	Description	Compliance Y/N	Product
		Annexure to Tender No. 44(10)2017-PUR/T-31 dated 11/07/2017 **for Establishment of Virtual Desktop Infrastructure** **Detailed Specifications**		
1	Platform:-	· 2 U, Hyper Converged Infrastructure Appliance/Block/ Enclosure with 3 Compute Nodes and 1 free bay/slot		
		· Fully Software Defined Infrastructure		
		· HCI Appliance/Block should be a standard product offering from OEM, not custom configured as per specifications from discrete building blocks		
		· Proposed product OEM should be in leaders section of Gartner's Magic Quadrant for Integrated Systems		
		The proposed solution must be on existing desktops with Virtual client booting option and all necessary customisation options available under VDI environment including security, authentication, access rights management etc		
2	Software	· Hypervisor Agnostic Installer		
		· Distributed File System (Native from OEM and not disparate Software products)		
		· Compatible with all leading Virtualization Software		
		· Per Node Controller VM		
		· Single Web interface Central Management for Compute, Network, Storage and Clustering		
		· Central Management interface to be capable of fully interfacing with Virtualization Management Software, regardless of solution size		
		· Web Management interface to support integration with Microsoft Active Directory for user account management		
		· Web Management interface to support uploading of signed certificates		
3	Hardware Specifications per Compute Node/server	As mentioned against each item		
3.1.	CPU/Sockets	Intel Xeon Processor, 2.1 GHz, 8 Core, Broadwell E5 2620v4, 20M Cache x 2 Nos (PER NODE)		
3.2.	Clock Speed	Minimum 2.10 GHz or higher		
3.3.	Main Memory	6 x 16GB DDR4-2400 Memory Module (per node)		

3.4.	Memory feature	Non-Uniform Memory Access (NUMA) Aware technology		
3.5.	Hard Disk Drives	2x 8TB, 3.5" (PER NODE)		
3.6.	Solid State Disks	1 x480GB, 3.5" (PER NODE)		
3.7.	Network Interfaces	10 GbE Dual Base-T Network Adapter (Per node)		
4	Power	Full Redundancy		
5	Cooling	Fans		
6	Cables	Cable 3 metres SFP+ to SFP+, 2 per Node, Power Supply Cables with appropriate terminations		
7	License	· Pro-entitlement or equivalent License for 3 years for Hyper Converged System/Nodes · All required Licenses for Network Interface · Management VMs shall also be made available for 3 years		
8	Single Point - System Support	· 3 Year Basic Support for Hyper Converged System, 24x7 · End to End, L3 through L1 support to be from OEM and not from any third party (even if third party licensed)		
9	Hyper Converged Infra and Native Software Warranty	3 Years		
10	Linear Scale Out	Up to 64 nodes in a cluster		
11	Hyper Converged Infrastructure - Essential Functionalities /Features	· **Hardware and Software to be from the same, single OEM** and not third party licensed/non-licensed · Converged Compute & Storage · Storage across all Appliance Nodes to be clustered and presented as a single, Self Healing Distributed File System to all hypervisor hosts · Native Single File System must support both iSCSI and NFS protocols · Seamless Scale-Out Architecture with zero downtime · Simplified NO-SAN Architecture · Simplified No-RAID, LUN Architecture		

		· SSD integrated File System		
		· Block Level Support for real-time data storage tiering between SSD and HDD disks to maintain optimal performance		
		· Capable of separate Compute and Storage Clusters with multi-cluster management for design flexibility		
		· Maintain a primary copy of active data on the nodes where VMs access them are running, in order to provide high IOPS and low intra-cluster traverse		
		· Capability to assign virtual machines to tier-0 of storage, in order to offer Quality Of Service to specific VMs / Workloads		
		· Identical configuration of Nodes regardless of size of deployment		
		· De-duplication Engine support		
		· Erasure coding support		
		· Replication and DR licensing to be supported without third party Software (when required)		
		· Per VM snapshots and replication		
		· Zero-overhead VM cloning		
		· Dynamic Scalability with Zero downtime		
		· Storage Thin Provisioning		
		· Must have capability to integrate with leading public cloud service providers and have stated roadmap for cross-cloud workload mobility		
		· Automated remote alert diagnostic capability		
		· Upgrades on Nodes to be done centrally, rolling upgrades over zero downtime.		
		· Performance monitoring capabilities		
12	Road Map	Clear Road Map for Product Line		
12	Product End of Life	Precise date to be declared if announced already, if not, Projected EOL date to be furnished		
13	Value Adds	Not covered above may be specifically mentioned with brief details		
		NETWORKING		
Sl. No.	Item	Description		
1	Platform:-	· 2 U, rack-mountable Switch - 16 ports - L3 - managed - stackable (2 Nos)		
		· 10 Gigabit Ethernet, 8 x 10GBase-T + 8 x 10 Gigabit SFP+ (2 Nos)		

		· High-Performance 10 Gigabit Ethernet, High Reliability and Resiliency, Advance Stacking, Should support SNMP.		
		· Category 5 Ethernet network cable for 10/100 speeds at up to 100m, Category 5e Ethernet network cable for Gigabit speeds at up to 100m.		
		· Category 6a Ethernet network cable for 10 Gig speeds at up to 100m.		
		· TCP/IP, network adapter, and network operating system (such as Microsoft Windows, Linux, or Mac OS X) installed.		
2	Software	· package of routing, switching, internetworking and telecommunications functions integrated into a multitasking operating system.		
		· ACL rules, IPv4 routes (static), IPv6 routes (static), QoS hardware queues, VLANs supported		
		· Should be of most widely leveraged network infrastructure software.		
3	Hardware Specifications per Node	As mentioned against each item		
3.1.	Device Type	Switch - 16 ports - L3 - managed - stackable (Per Switch)		
3.2.	Subtype	10 Gigabit Ethernet (Per Switch)		
3.3.	Ports	8 x 10GBase-T + 8 x 10 Gigabit SFP+ (Per Switch)		
3.4.	SFP	10GBASE-CU SFP+ Cable 1 Meter (Per Switch)		
3.5.	Performance	Forwarding performance (64-byte packet size): 238.08 Mpps Switching capacity: 320 Gbps		
3.6.	Jumbo Frame Support	9000 bytes		
3.7.	Max Units In A Stack	8		
3.8.	Authentication Method	RADIUS, Secure Shell (SSH), TACACS+		
3.9.	RAM	512 MB		
3.10.	Flash Memory	256 MB		
3.11.	MAC Address Table Size	64K entries		
3.12.	Encryption	MD5, SSL		

	Algorithm			
3.13.	Routing Protocol	RIP, IGMPv2, IGMP, VRRP, IGMPv3, static IPv4 routing, static IPv6 routing, MLDv2, MLD, CIDR		
4	Power	Full Redundancy		
4.1	Features	Redundant Power System (RPS) connector		
5	Single Point - System Support	3 years,		
5.1	Service	phone consulting, replacement, web support		
	VDI SOLUTION Software and Licenses			
Sl. No.	Item	Description		
1	Software Licenses	User/Device License (50 Nos)		
2	Services	User/Device License Software Maintenance 1 Year (50 Nos)		
1		**Virtual Desktop / Application**		
		The solution must support Windows based desktop virtualization with the ability to run Windows 7, Windows 8.1 and Windows 10 OS based virtual desktops		
		The solutions must support session based desktop virtualization on windows server operating system with support for Windows server 2008R2, 2012R2 and 2016		
		The solutions must support Application virtualization on windows server operating systems with support for Windows server 2008R2, 2012R2 and 2016		
		The solution must support Linux based desktop virtualization with support for RHEL, Suse and CentOS distributions		
		The solution must support session based desktop virtualization on Linux operating systems with support for RHEL, Suse and CentOS distributions		
		The solution must support Linux based application virtualization with support for RHEL, Suse and CentOS distributions		
		The solution should support redirection for any USB 2, USB 3 and USB-C port based devices used in the organization.		
		The solution should support redirection for any COM port based device used in the organization		

		The solution should support redirection for any LPT/Parallel port based device used in the organization		
		The solution should support client based as well as clientless access for Linux/windows based desktop/application virtualization		
		The solution must support printing from direct attached printers		
		This solution should support printing from network printers		
		The Solution should support printing from shared printers		
		The solution should support MFD, Laser, Dot-matrix, thermal and ink based printers		
2		**Performance**		
		The time taken to launch and access a virtual desktop should be less than 15 seconds		
		The time to launch and access an virtual application should be less than 10 seconds		
		The users documents and content should be available at all times and it should be stored centrally		
		The solution should allow users to open Heavy workloads in the virtual applications / virtual desktop without impacting experience of other users on the same server		
		The virtual application and desktops on a server should continue to be responsive even if the CPU utilization reaches 100%		
3		**Cloud Support**		
		Solution should support having DR of the setup on Microsoft Azure Public Cloud		
		Solution should support having DR of the setup on Amazon AWS Public Cloud.		
		It should be possible to burst the existing on-premise setup onto Azure or AWS public cloud. i.e. phase 2 of the deployment can happen on the cloud while phase 1 remains on-premise all while maintiaining a single setup from management and reporting perspective		
		It should be possible to deploy and run the entire setup on the cloud. Using the public cloud platform as an infrastructure as a service IaaS		
4		**Application / media support**		
		The solution should be able to optimize the delivery of Microsoft skype without any network hairpinning		
		The solution should be able to optimize delivery of voice using softphones without any network hairpinning		
		The solution should have the ability to offload rendering of video and flash content to endpoint when the endpoint is capable		
		The solution should support all browser based and installer based applications for use in the virtual application and virtual desktops		
		The solution should support all windows as well as Linux based applications and desktops		

5		Content Protection		
		The solution should be able to allow or restrict copy - paste of data from between virtual application/ desktop and the endpoint used to access the environment		
		The solution should have the ability to restrict or allow copy-paste operation of content based on what content is being copy pasted. i.e. separate control for text and separate control for images		
6		Access Control		
		The solutions should authenticate users based on their active directory credentials		
		The solutions should be able to provide access or restrict access to applications based on users AD group membership		
		The solutions should have the ability to provide access to certain applications without any authentication prompt		
7		Management & Reporting		
		The solution should have a separate console for desktop/application virtualization management and user support		
		The consoles should support granular level of control and provide role based access		
		The solution should provide historical reports related to resource utilization of the environment with a minimum lookback of 30 days		
		The solution should be able to identify and measure the responsiveness of the endpoint being used to access the virtual desktop		
		The solutions should be able to provide metrics and reports around time taken by the backend application server to service a request		
		The solution should have the ability to integrate with 3rd party reporting suites for unified reporting		
		The solution proved a unified dashbord for user processes, User Logon and Users network parameters		
8		Network Parameters		
		The solution should take no more than 35kpbs bandwidth per desktop when a virtual desktop is being delivered. Additional WAN optimization devices may be quoted to achieve this.		
		The solution should take no more than 16kpbs bandwidth when a virtual application is being delivered. Additional WAN optimization devices may be quoted to achieve this.		
		The solution should be capable of running on high latency links like VSAT. The solution should run without any challenges on links with latency as high has 1800ms		

		The solution should be capable of handling packet loss and should work without disruption on lines with packet loss as high as 2%		
		The solution should be capable of running on the below networks with zero change in user experience		
		VSAT links with varying latencies		
		MPLS links		
		Broadband connections provided by local ISP		
		Point to point network		
		Telecom service provider network with EDGE and higher connectivity		
		The solution should be able to run in conjunction with IPSEC tunnel in use over the organizations WAN		
		The solution should be compatible with all the network elements currently deployed at the organization.		
9		**Endpoint**		
		The solutions should support Windows, Mac, Linux, IOS, Android and Chrome devices as endpoints		
		The solutions should have clients available for Windows, Mac, Linux, IOS, Android and Chrome devices		
		The solution should support HTML5 based clientless access		
		HTML 5 based clientless access should not require additional network bandwidth when compared to the access via the locally installed the client		
		The solution should provide the same user experience irrespective of the endpoint being used to access the virtual desktop/application		
		The solutions should provide touch based access to virtual desktop and virtual applications when accessed from touch based devices		
		The solutions should support multi-touch functionality seen in phones and tablets		
		The solution should have the ability to dynamically change the user interface based on the input methods available on the endpoint i.e. the UI should be come touch friendly on touch based devices		
10		**Tools for user support**		
		The solution should provide built in tool to take a shadow of the users session without incurring any additional load on the WAN link		

		The solution should have the ability to search for session based metrics using the users username		
		The solution should be able to provide detailed metrics around the individual processes running in a users session		
		The solution should provide the ability to centrally kill user process that are causing problems in the users session		
11		Regulatory compliance		
		App components involved in the solution have to be FIPS 140-2 Compliant		
		The solution should have valid Common criteria certificate available for all the components involved		
12		**Deployment**		
		The deployment should be in line with the established best practices for the product and must include the below documentation at minimum		
		High Level design document		
		User profiling document		
		Low level design document		
		Build and deployment Document		
		FAQ document for support staff		
		Run book for commonly needed tasks		
		The deployment should be conducted in the following sequence		
		Project Kick-off		
		User profiling		
		Low level design sign-off		
		UAT and UAT sign-off		
		Software Licenses		
1		SQLSvrStd SNGL SA OLP NL Acdmc-icrosoft®SQLServerStandardEditionSnglSoftwareAssurance Academic OLP 1License NoLevel - 1 Qty		
2		WinRmtDsktpSrvcsCAL 2012 SNGL OLP NL DvcCAL-Microsoft®WinRmtDsktpSvcsCAL 2012 Sngl OLP 1License NoLevelDvcCAL - 50 Nos.		
3		WinPro 10 SNGL Upgrd OLP NL Acdmc-Microsoft®WindowsProfessional 10 Sngl Upgrade Academic OLP 1License NoLevel - 50 Nos.		

Sl. No.	Item	Description		
	Implementation			
Sl. No.	Item	Description		
1	Implementation	End to End Implementation to be done by one supplier.		

Serial No.	Sub Serial. No.	Category	Specifications	Compliance (Yes /No)
1	**Storage and Servers**			
	1		The proposed solution should be hypervisor agnostic and should support hypervisors like VmwareESXi, Microsoft Hyper-V, KVM	
	2		The proposed HCI solution should be 100% software defined and should not use any hardware bases RAID or compression or de-duplication	
	3		The proposed solution HCI should run on industry standard x86 servers and support systems from various vendors.	
	4		The proposed solution independently scale storage and compute as and when needed without any downtime. HCI should support storage only nodes to extend storage capacity as and when needed.	
	5		The proposed HCI solution must have medadata distributed on all nodes in a cluster i.e. each node in the cluster should carry information about data lying across every node in the cluster.	
	6		The proposed solution must have capability to support nodes with different CPU & Memory configurations in the same cluster	
	7		The proposed solution must provide high performance by exposing storage resources (i.e. direct attached SSD and HDD) on the same host as the guest virtual machines making requests.	
	8		The solution must support automated tiering (including RAM cache, flash read/write, HDD read/write). Tiering must occur in real-time and elevate data into the flash and RAM tier based on access patterns.	
	9		Thin provisioning of both storage pool/containers and virtual machine hard disks	
	10		The solution should provide automatic failover for hardware failure.	
	11		The solution should support at least one of these protocols NFS , SMB , ISCSI	
	12		Shall support automated chassis redundancy and survive the failure of entire chassis	

			containing multiple nodes. In a multi-chassis configuration the infrastructure must intelligently distribute data across chassis so no redundant copies of data exist on the same chassis or node.	
	13		Shall support maximum host cluster sizes for VMWare vSphere , Hyper-V and Open KVM	
	14		Support for automated upgrades of storage controllers through management GUI with no downtime or vmotion of virtual machines.	
	15		Support for layer-2 VLAN for networking and integrated VM IP's Management capability	
	16		Distributed caching of virtual machine data providing local read access to vDisks in multi reader situations. This feature must not require any manual configuration and be provided natively at the storage layer.	
	17		Shall distribute data intelligently across all nodes and capacity utilization acorss all nodes has to be uniform at all times.	
	18		Shall be capable of adding additional combined server and storage components with high performance GPU capabilities, seamlessly, with no downtime, to scale performance and capacity on demand.	
	19		Native storage level snapshots with no impact to guest performance or using any additional storage capacity.	
	20		The solution should support Erasure Coding for disk space optimization	
	21		The platform should support encryption at disk level with third party software support	
	22		The platform should support stretch cluster with in 100KM radius with less than 5ms response across site	
	23		The solution have capability to pin desired workload to run in SSD tier to get maximum IOPS for application	
	24		The proposed HCI must natively support File Services (NFS, CIFS & SMB) and file replication across clusters and data centers	
	25		The proposed HCI must support connectivity of 3rd party servers to HCI cluster & use the cluster capacity like a generic storage	
	26		The proposed HCI solution should have built-in self service cloud capability, that allows automatic	
	27		The proposed HCI solution must provide operations management and provide performance, storage, CPU utilization per VM.	

	28		Proposed solution should be out of the box compatible with VMWare Horizon Enterprise or Citrix Virtual Desktop and databases like MS SQL, Oracle. The solution must certified to run SAP and Oracle RAC.	
	29		The proposed solution must support NVM-e SSDs	
	30		The proposed nodes should support 10G SFP+ & Copper connectivity. Each node should support at least 4 x 10G Ports.	
	31		The HCI solution should support One-Click Hypervisor conversion without data destruction or need for backup restoration	
2	**Management**			
	1		Platform must provide management through a web based HTML 5 console. Must provide storage, compute & hypervisor metrics on a per VM level as well as health and monitoring of entire platform. Console must support LDAP/Active Directory integration, SSL. Must provide capability to restrict interactive shell access	
	2		Must support a centralized console that allows viewing and administration of multiple sites and clusters from a single console with single sign-on (SSO)	
	3		Platform must provide connectivity for centralized monitoring via SNMPv3 and email alerting via SMTP.	
	4		The Management platform should be capable of run search queries and perform actions in improving user experience and must have analytics for future prediction along with recommendation remedies.	
3	**Backup**			
	1		Shall be capable of creating instant snapshots of virtual machines and maintaining multiple copies of snapshots & clones	
4	**Data**			
	1		The solution must provide deduplication & compression (configurable as Inline or Post-Process) across All-Flash as well as hybrid nodes	
	2		The solution must support compression & deduplication spanning all storage including RAM, flash and HDD	
	3		Proposed HCI solution should support fault tolerance of 1 node or 2 node failure within a cluster. The solution should support configuration of this feature on per application basis within the cluster.	
5	**DR & Replication**			
	1		Solution must support native VM level replication for various supported Hypervisors without dependency on Hypervisor feature	

	2		The solution should support backup to cloud with leading cloud provider like Amazon, Azure	
	3		The solution should have an integrated backup and disaster recovery solution with deduplication and compression over WAN	
	4		The proposed solution should support multi-site (One to Many & Many to One) replication.	
	5		The proposed HCI solution must natively support cross Hypervisor VM level replication without the use of any third party softwares or application dependency.	
6	Support			
	1		Shall include 24x7x365 infrastructure maintenance and support for all hardware and software components of the proposed solution, including updates and patches as well as technical support available via telephone, email, and web during all hours (24 hours per day, 365 days per year).	
	2		Parts replacement delivery shall include 4-hour delivery	
	3		The solution should have call home capability for remote log collection and proactive support for predictive failure hardware component	

Serial No.	Sub Serial. No.	Category	Specifications	Compliance (Yes /No)
1		**42U Server Mounting Racks Qty: 2**		
	1	**Rack**		
	2		9" Rack with fully perforated steel doors in the front and back,	
	3		AC mains channel, Earth continuity kit, Castors with foot-operated brakes, supporting load	
	4		rating of 1000Kgs and with all Black finish.	
	5		The racks shall house the servers, storage, switches and other items.	
2		**Accessories. For each Rack**		
	1		Power Distribution Units (minimum 2 full-size vertical + 2 horizontal PDUs) with Indian type sockets having input & output current ratings needed for the items housed in each rack	
	2		Sufficient numbers of Cable Managers for each rack	
	3		Tray (1 No.)	
	4		Cooling Fans	