

TECHNICAL SPECIFICATIONS

ITEM#1 Hyper-Converged Infrastructure

1. Scope of Work SOW
2. Virtualization Management
3. Virtualization Hypervisor
4. Storage virtualization
5. Network Virtualization
6. Backup Functions
7. DR Functions
1. Scope of Work SOW:
Must include Deployment and Migration Services by OEM.
scope of migration will be shared but LESCO with OEM to calculate number of physical servers and virtual machines.
Must Quote the licenses of HCI for 20 sockets
Must Include Onsite Training of 03 Participants by OEM.
Must Quote 05 Years 24/7 Software Technical Support Services backed by OEM.
2. Virtualization Management:
a. Proposed Solution must provide High Availability / Redundancy for Virtualization Management Platform.
b. Proposed Solution Must be compatible with any brand/Generation of Intel (x86) Architecture Processors.
d. Virtualization management system nodes provide active and standby redundancy to ensure the availability of the platform.
e. The virtualization platform has a built-in virtualization system health evaluation model.
f. Proposed Solution must support to create and manage local Users with Role Based Access and Permission Control.
g. Proposed Solution must Support Management for Existing Virtual Machines on VMware Platform for single window management.
h. The solution able to support draw topology and power on the VMs and Virtual Switch based on the draw diagram in the HCI Management GUI. This is for IT administrator easy to maintain the HCI cluster.
i. The visual real-time monitoring center provides a unified visual monitoring and management center for the failure of HCI of the overall software and hardware, reducing the operation and maintenance difficulty and workload. The visual real-time monitoring center can provide hardware reliability (including CPU, memory, disk, physical network card and raid card), system reliability (including cluster host, distributed storage, cluster network configuration status and cluster resource overload state), service reliability (including Disaster Recovery, cluster reliability HA, DRS, AI based Predictive DRS, virtual machine operation status and virtual machine backup) these three-levels real-time monitoring and hierarchical display. The operation and maintenance personnel can directly view the overall operation of the cluster and can quickly diagnose the health status of the cluster.
j. Monitor the hardware platform including power supply, fan, temperature sensor, CPU, memory, hard disk and other hardware platform information of HCI.
k. Proposed Solution must provide Web Browser based Management Console.
l. Proposed Solution must provide complete visibility and centralized management / control of the Virtualization Platform
m. Proposed Solution must provide capability to scale up to minimum of 64 nodes or better.
n. Support to analyze the usage of historical resources of virtual machine, host etc up to 1-year historical data or better
Support resource capacity prediction service, built-in time series model, management platform to automatically realize data prediction, provide users with easy-to-use data prediction service, the service supports display the storage capacity resource usage. Based on AI Machine learning algorithms, predict and analyze early warning time points to help users do resource expansion, cost budgets, etc., and improve business reliability.
p. Must support live migration between existing HCI solution and the proposed HCI solution.

3. <u>Virtualization Hypervisor:</u>
a) Proposed Solution should be highly redundant providing capability for the VMs to restart on another node in case of any Node failure in the Cluster.
b) Proposed Solution must provide VM Snapshot capability to revert back to previous point in time in case a failure or system error occurs.
c) Proposed Solution must provide VM Clone capability for creating cloned instances from source VM for testing or any other purposes.
d) Provides virtual machine snapshot function, supports setting manual and periodic snapshots. must support consistent snapshots for (Add multiple virtual machines to the consistency group to implement consistent snapshots and restore of the whole group of virtual machines)
e) Supports clustering of multiple physical servers and can perform dynamic resource scheduling based on CPU and memory utilization.
f) Supports setting read and write limits for virtual machine disk IOPS and I / O rates.
g) Virtualization software has a built-in backup module, which enables full and incremental backup of virtual machines without the need to install backup software separately. It has no impact on business operations during backup, and supports scheduled backup (hourly, daily, weekly) settings.
h) Proposed Solution must support mounting of storage using Industry's common storage protocols including iSCSI, FC, Network File Sharing (NFS).
i) Proposed Solution must provide VM vMotion/live migration capability to live migrate VMs to any nodes in the Cluster without any downtime.
j) Proposed Solution must provide the capability to hot-add resources including vCPUs and Memory.
k) Proposed Solution must provide automated Resource Scheduling and Load Balancing capability for balanced performance on all nodes across the cluster.
l) Proposed Solution must provide Distributed Switch capability to configure and administer switching for the entire Cluster.
m) Proposed Solution must support virtual machine USB mapping across physical hosts; you can perform virtual machine USB mapping operations.
o) Proposed Solution must support Host CPU & Memory Overcommitment Ratio Control.
P) Hyper-convergence must support proactive HA function (Means VMs on sub-healthy hosts will automatically hot migrated to healthy hosts without any manual intervention) Users can flexibly choose the response method for sub-healthy hosts. Must also support AI based Predictive DRS.
q) The proposed hypervisor must support agentless VM-level backup by integrating with Veeam and NetBackup.
4. <u>Storage Virtualization:</u>
a) Proposed Solution must provide SSD based Read Caching to improve the performance of the I/O.
b) Proposed Solution must provide Automated Data Rebuilding capability to restore redundancy in case of any Disk or Node Failure.
c) The Striped data multi copy mechanism is adopted to ensure the data reliability. The redundancy mode of RAID1 is not allowed. Independent hot spare is not needed in the storage node.
d) Supports 2~3 copies
e) Three nodes support the deployment of three copies. It is not allowed to add additional hard disks (groups), capacity, or nodes to satisfy the replication strategy. Make full use of the resources of each disk and each node.
f) Flexible requirements for redundancy strategy: A group of hard disk pools (groups) can support both 2-copy and 3-copy strategies to maximize the use of disk capacity. There is no need to use additional disk groups to carry two different strategies, which greatly reduces customer costs.
g) Data balance requirements: It is required to balance the data.
Supports disk replacement wizard, provides a graphical and wizard-based interface, supports hot-swappable replacement of hard disks, and brings more efficient maintainability
5. <u>Network Virtualization:</u>
a) Must support NFV functions with the same Vendor and the NFV should be integrated in the same console as proposed hypervisor.
b) Proposed Solution must provide capability to display Network Traffic Flow.

c)Proposed Solution must provide complete Network Visualization of Virtual Network.
d)Proposed Solution must provide capability for Network Quality of Service (QOS).
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e) Proposed Solution must include feature and license of Distributed Virtual Switch, Distributed Virtual Router, Distributed Firewalling (Micro-Segmentation).
6. Backup Functions:
a) Built-in backup function must be fully Compatible with Compute Hypervisor
b) Built-in backup function must provide the capability to take full / Incremental level VM Backups.
c) Built-in backup function must provide Automated Scheduling for Backups based on Hourly, Daily, weekly etc. scheduling.
d) Built-in backup function must support to configure Internal Virtual Storage, External SAN or NAS to be Backup repository for Storing Virtual Machine Backups.
e) Built-in backup function must support Industry's common storage protocols such as iSCSI, FC or Network File Sharing (NFS)
f) Built-in backup function will not be limited to specific number of VMs and will support unlimited number of VMs for future scalability.
7. DR Functions:
a) Must have virtual machine-level disaster recovery with configurable RPO, and the RPO value must include license of 5xVMs.
b) The disaster recovery software must has the ability to simulate disaster recovery drills.
c)When the primary site returns to normal, the disaster recovery software supports one-click failback function.
d)The disaster recovery solution must be compatible and support VM level replication to existing HCI solution deployed at LESCO Datacenter.

ITEM#2 Virtual Application Load Balancer

Virtual Application Load Balancer Qty=2
Must be a virtual appliance and supported on the Hypervisor in Item#1(Hyper-Converged Infrastructure)
Must Be Listed in Gartner Magic Quadrant for Application Delivery Controller.
Must Have Minimum 4 Gbps L4/L7 Throughput or more.
Must Include inbound load balance, outbound load balance, DNS proxy.
Must Include Application Aware Server Load Balancing.
Must Include L4/L7 Content-aware switching and load balancing, and being able to be deployed as multiple virtual services for separate applications.
Must Support server smooth on-line and off-line, eliminating server overload by limiting maximum access and maximum concurrent session in server.
Must Support complete health monitoring based on SNMP, ICMP, UDP, TCP, DNS, RADIUS, HTTP, database (MYSQL /MSSQL /Oracle) and customized strategy.
Must Support Passive health checking based on TCP and HTTP and detecting failed server by service flow.
Must Support TCP monitoring for enabling server overload prevention.
Must Support Surge prevention and connection queuing in balancer cache if server is overload.
Must Support Advanced strategy including HTTP request/response rewrite, HTTP/HTTPS request match, automatic page forwarding, page abandoning.
Must Support SSL acceleration, HTTP compression, RAM caching,
TCP connection reuse for speeding user access and reducing hardware
Must Support Enabling sticky sessions by resource IP, Cookie (insert /passive /rewrite) HTTP (Header /Body), RADIUS, SSL Session ID.

Must Support Load balancing for Oracle, PostgreSQL and Mysql database and improving database server resource use.
Must Support Realtime Statistics of Server Node Pools, Applications & Server Downtime.
Must quote 3 Years Complete Features License.
Must quote 3 Years Software Upgrade & 24x7 Technical Support.
Must quote Onsite Configuration & Installation.