



ADDENDUM - SDN Solution Requirement

Gem Bid No: GEM/2024/B/4508521

Sl no.	Items	Description	Compliance Yes / No	Cross Ref.
1.	Definition	- Proposed fabric must be the Clos network topology architecture defined using Spine, Leaf switches with VXLAN overlay and EVPN standards. - Fabric should have following functionalities to be achieved: - Flexibility: Should allow workload mobility anywhere in the DC, across the Data Centre sites - Resiliency: The proposed fabric should be able to sustain multiple link and device (Leaf & Spine), Controller failures - Performance: The proposed fabric should be able to use full cross- sectional bandwidth (any-to-any) across all provisioned uplink ports using equal cost multi-pathing. - Operations: Solution should provide flow analytics using hop by hop latency and packet drop info for specific flows, which helps identify, locate and root-cause data path issues across fabric architecture. - Multi-Data Center design: The proposed architecture should provide a single pane for provisioning, monitoring, and management to deploy stretched policies across multiple Data Centers. - All relevant licenses for all the features and scale should be quoted along with switch and all these licenses and features should be available from Day 1. - The leaf-spine network fabric must be capable to provide latest network virtualization technologies to provide seamless movement of any type of user across the network. - Leaf spine fabric must have fully distributed architecture without any centralized data plane, control plane and management plane processing on single device.		



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		5. The leaf-spine fabric must support distributed anycast gateway, Active-active EVPN multihoming		
2.	Hardware and Interface Requirement	1. Leaf switches to Spine connectivity should be through uplink port using line rate of 100 Gbps or better 2. All switches including Spine and leafs should be of line rate including access ports and uplink ports. All the interfaces should be non-blocking. 3. Fabric should support scale up and scale out without any service disruption. 4. Fabric must support minimum of 02 leaf switches 5. Fabric must support minimum of 02 spine switches and scale up to 06 spine switches without any design change.		
3.	Fabric General features	1. Fabric must support various Hypervisor encapsulation including VXLAN and VLAN natively without any additional hardware / software or design change. 2. Fabric must support VXLAN Switching/Bridging and VXLAN Routing. 3. Fabric must integrate with different Hypervisor Managers viz. Vmware vCenter, Kubernetes, Redhat Openshift and manage virtualise networking from the single pane of Glass - Fabric Controller/SDN Controller for visibility of VM/Container at the controller level. 4. Fabric must integrate with all proposed L4 - L7 Physical and virtual appliances using single pane of glass i.e. Fabric Controller or SDN Controller. 5. Fabric must provide deeper visibility in terms of latency and packet drops between any two endpoints on the fabric. 6. Solution should provide L2 & L3 extension across multiple sites/ Data Centres. 7. Fabric must act as single distributed layer 2 switch, Layer 3 router and Stateless/stateful distributed firewall or rule / flow based filtering device.		
4.	Fabric Security Features	1. Fabric must have zero trust policy model for directly connected systems or hosts in order to protect against any kind of attacks like Unauthorized Access, Man - in - the - middle –		



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		attack, Replay Attack, Denial of Service and to protect against Data exfiltration. 2. Fabric must provide RBAC policies and support AAA using Local User authentication, External RADIUS, External TACACS+, External LDAP and External AD. 3. Fabric /SDN controller should support micro-segmentation rules and policies for workloads connected to DC fabric for east-west traffic. It must also support micro-segmentation based on VM attributes / IP based zoning. 4. Fabric must support Micro Segmentation for the Virtualized and Non - Virtualized environment (Bare metal and Container). 5. Fabric must act as a State-less/stateful distributed firewall or rule / flow based filtering device with the logging capability. 6. Fabric must be capable of inserting physical and virtual L4 - L7 (FW, LB, IPS) services dynamically between multiple segment using policy-based traffic redirect. 7. The solution should provide visibility of bugs and CVEs that are impacting the installed network devices. It should also show deviation from provisioned config and image as part of the compliance. 8.		
5.	Cloud Ready & Integration with proposed cloud solution	1. Fabric architecture must support seamless network and security extension to the proposed cloud solution, multiple cloud as well. Centralized controller is able to provide seamless connectivity within proposed cloud solution, across clouds and on premise to cloud. 2. Centralized controller must provide traffic segmentation within proposed cloud solution, across clouds and On premise DC as well. There should be seamless extension of policy / segment in case workload movements between clouds or on premise to cloud 3. Centralized controller must provide complete network visibility into proposed cloud environment. 4. The SDN controller has to be integrated with the proposed cloud solution and all the required features of the SDN controller has to be demonstrated up on integration with the cloud solution. 5. The solution should support user definable work flows to carry out multiple network-wide changes		



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		with Support for automated execution and conditional checks.		
		6.		
6.	Fabric Management	1. Fabric must provide Centralized Management Appliance or SDN Controller - Single pane of glass for managing, monitoring and provisioning the entire Fabric within Data Centre & across all Data Centers. 2. The solution should have capability for automated topology discovery 3. Fabric must Auto discover all the Spine and Leaf switches and auto provision them based on the Fabric policy using Centralized Management appliance or SDN Controller. 4. Centralized management appliance or SDN Controller should not participate in Data plane and control plane traffic path of the fabric and a network device must continue to forward packet in case it loses connectivity to the manager. 5. Centralized management appliance or SDN Controller must provide Anomaly and Advisory reports for compliance and audit. 6. Solution should be able to store historical data to provide anomalies and trending information of each resource (environment, configuration & operational) and graphical representation of parameters to help debug. 7. Solution should provide an automated mechanism to find configuration deviations, security risks & non-compliances against segmentation rules by assessing current configuration, network security policies and generate alert for any deviation to provide assurance. 8. Management and monitoring of the Data Center Network must be provided through GUI centrally 9. All network Devices including leaf switches, Spine Switch should be automatically provisioned minimizing human effort and human errors with network wide configuration deployment. 10. The solution should provide scale out capability with centralized management to receive SPAN traffic on 100G ports directly connected from each leaf switch, do packet operations like header (VXLAN, GRE, ERSPAN, GENEVE) striping, packet truncation, PTP timestamping, masking of confidential data within packet through regex and packet deduplication before the traffic is sent out and load-balanced to other tools like NDR, SIEM,		



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		etc. All configurations of the solution should be available through GUI. 11. All the network devices and solution components should be manageable and monitored through GUI completely.		
7.	Network Visibility & Analysis	1. Solution should provide network visibility and historical analysis between any two timeframes to identify any issues and changes including user information 2. The solution should provide pre-change analysis of the configuration to highlight any challenges and issues before pushing the configuration within the fabric to reduce the risk of network failures and human errors for a robust change management. 3. Solution should provide instant visibility into any relevant and applicable bugs and security advisories for running hardware and configuration. 4. Solution should provide recommendations on software update & best practices based on installed platforms and running configuration in network practices based on installed platforms and running configuration in network. 5. Centralized management appliance or SDN Controller must communicate to south bound devices using open standard protocols or using Device APIs. 6. The solution should provide real-time monitoring of various parameter of the network device using real-time state streaming telemetry or better technology. 7. The solution should provide real-time monitoring of various parameter of the network device using real-time state streaming telemetry or better technology. 8. The streaming telemetry data from all network devices should be available for historical analysis of past events in time-series format for 2 or more months. 9. The solution is expected to provide real-time monitoring of various network device parameters like CPU, Memory, interface stats (traffic counter, error, discard), MAC table, ARP table, IPv6 ND table, RIB, BGP, capacity parameters (TCAM), file system storage parameters, VXLAN, running config, traffic flow (OpenFLOW / sflow / IPFIX / Netflow), LLDP, buffer utilization per interface, LAG / MLAG /		



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		LACP Stats, Switch environment stats (FAN, Temperature, Power Supply), etc. with streaming telemetry. 10. The solution should be capable to show in real-time congestion hotspots in the network with buffer level utilization info from the network devices. 11. The solution should show real-time & historical analysis of network traffic flows. It should provide analysis of network traffic patterns over months, days, or minutes by drilling down to an individual IP and application. Should support ingestion of at least 5K flows per second. 12. The analytics solution should be capable of performing proactive (machine learning based) analysis and provide anomaly detection with auto baselining and alerts on traffic flow parameters 13. Notification and device events should be available to operator in a manner that are easy to correlate by directly showing them over physical topology for various device and link level metrics. 14. The solution should capture meta data packets like ICMP, ARP, DNS, DHCP, TCP Syn/syn-ack packets to provides deeper analytics, like identifying rogue DHCP/DNS servers, IP/MAC spoofing, new endpoints, most used domain names, etc. 15.		
8.	Redundancy & Availability	1. Centralized management appliance or SDN Controller must run in "N +1" redundancy to provide availability as well as to function during a split-brain scenario. 2. In the event of failure of all Centralised management appliances or SDN Controllers, the fabric must function with the current configuration and without any performance degradation. 3. Centralized management appliance or SDN Controller must provide real-time device inventory and network topology of the fabric. 4. All the infrastructure including hardware and licenses required by fabric controllers to support the listed features and scale, should be provided by the bidder. 5. All the features mentioned in this document shall be available from Day 1. Hardware, Solution Software and licenses should be supplied from Day 1 to support these features. 6. Data Center Network must be fully resilient in all		



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		aspects. It must continue to perform packet forwarding on any single link failure. A single switch failure should not impact forwarding for hosts connected to other switches. The architecture should provide two or more equal cost forwarding paths from switches to core. 7. The solution should provide centralized dashboard to upgrade all the network devices with ease without incurring traffic downtime in network. 8. Solution should provide simplified and quick way of network wide rollback for device configuration and images to revert back changes if required. 9. Any additional hardware, if required to run the dashboard/GUI must be part of the bid and must be provided in HA at both DC and DR		
9.	General requirements, warranty and support	1. Manufacturer Authorization is Required 2. All the required network switches, software, license and support components should be factored as per the specification and should be from same OEM from Day 1. Specifications mentioned are minimum required, OEM/Bidder can quote higher models/specifications. 3. OEM(s) professional Services have to perform complete plan, design, implementation and validation of all components of the solution, OEM professional Services personnel should be on OEM Payroll only. Part Number of the same need to be shown in Technical Bid 4. The proposed solution OEM(s) should have a registered office in India and an India local Technical Assistance center (with an India local number to reach the TAC). 5. TAC support for (Routers, Spine, Leaf, Management Core & Management/OOB Switch) solution must be directly from single OEM. OEM should have 24x7 TAC available over email and Phone. 6. Bidder should submit fully complied solution, any deviation will result in bid rejection and Intentional wrong compliance claims will result in blacklisting of OEM & Bidder for next 3 years 7. The OEM professional services should also provide knowledge transfer and handover training for minimum 2 weeks and OEM certification for 5 members 8. All Quoted Models / Products (Data Center Network Management and Visibility Solution, Routers, Spine, Leaf, Management Core &		



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		Management/OOB Switch) should have support life of 7 years minimum from the Date of installation sign off, same need to be confirmed in signed MAF. 9. OEM/Bidder should have quoted required hardware/VM's/appliance to deploy Data Center Network Management and Visibility Solution in HA. 10. Minimum Qty Required - 1 Solution at DC in HA & 1 Solution at DR in HA		
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