# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Supply of hardware for functioning of New Computerized Transit System (NCTS) p 1 / 22**

**Publication reference:**EuropeAid/139357/IH/SUP/ME

**Columns 1-2 should be completed by the Contracting Authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the Contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the Contracting Authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words “compliant” or “yes” are not sufficient)
* Column 4 allows the tenderer to make comments onitsproposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offered specifications.

**Unless otherwise specified, the requirements in these Technical Specifications are presented as a minimum standard which the offered goods must meetin order to be compliant. Tenderers may not submit a variant solution for the items required in these Technical Specifications.When brand names are used in the technical specifications, they are “used in descriptive purposes only” since there is no other comprehensive description possible.**

1. **GENERAL** 
   1. **Description of the project**

The subject of the contract shall be supply, delivery, unloading, installation, testing, putting into operation of IT equipment and training (for the relevant items) as prescribed in the technical specifications.

* 1. **Technical requirements**
  2. All equipment shall be provided complete with the necessary accessories and/or parts such as to ensure that the unit is capable of operating to the required technical specifications. All specifications details listed for each item are the minimum requirements. Any features superior to the minimum specifications or additional features offered should be clearly identified in the Tenderer’s offer
  3. The items provided should not be hybrids and should be a registered brand name
  4. The offered equipment must be new and unused
  5. Equipment which allows upgrading of capacities shall be provided in such a way that upgrades can be performed by installing additional capacity without discarding the already installed capacities
  6. The Contractor shall provide documentation - user’s operation and maintenance manuals, which shall be in such detail as will enable the users to operate, maintain and adjust all parts of the supplies. All operating and maintenance manuals shall be in English or Montenegrin Language
  7. The bidders are obliged to specify the conditions of the environment necessary for the proper operation of the equipment. If special conditions are required, they must be specified in detail.

The tenderer must submit documentary evidence (brochures, technical data sheets etc.) of the technical compliance of his offer.

**1.3. Delivery address**

All supplies must be delivered to the following address:

The Customs Administration, Bulevar Oktobarske revolucije 128, 81000 Podgorica

**APPENDIX:** Description of the existing IT system in the Customs Administration

| **1.**  **Item Number** | **2.**  **Specifications Required** | **3.**  **SpecificationsOffered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation Committee’s notes** |
| --- | --- | --- | --- | --- |
| **1** | **Storage system -** IBM Storwize v7000 GEN 2 or equivalent**–Quantity: 1** |  |  |  |
| **1.1** | Supports No Single Point of Failure (fully redundant controller units, power supply, ports) |  |  |  |
| **1.2** | The control enclosure of system contains dual redundant controllers, each with a 10-core 2.2 GHz processor with 32 GB or 64 GB of cache. |  |  |  |
| **1.3** | System has minimum 20 Cores per control enclosure and 80 per clustered system |  |  |  |
| **1.4** | System has following cache memory (cache per control enclosure/clustered system): 64 GB, 128 or 256 GB/up to 1,024 GB |  |  |  |
| **1.5** | Has possibility to provide FC, iSCSI, FCoE connections for SAN environment. |  |  |  |
| **1.6** | Supports flexible host interface options include 16 Gbps Fibre Channel, 1 Gbps iSCSI, and 10 Gbps iSCSI or Fibre Channel over Ethernet. |  |  |  |
| **1.7** | Supports SSD, SAS and SAS\_NL HDDs in the same expansion unit and possibility to accommodate both 2.5" and 3.5" drives. |  |  |  |
| **1.8** | Control enclosures of system supports three models of expansion enclosures with 24 2.5-inch, 12 3.5-inch, and high-density enclosure with up to 92 3.5-inch or 2.5-inch drives. |  |  |  |
| **1.9** | System control enclosure supports minimum 20 expansion enclosures or eight high-density enclosures attached using high-performance 12 Gbps SAS |  |  |  |
| **1.10** | System supports minimum 760 HD drives without using virtualization or clustering mechanisms.  Supports clustering in case of extra scalability is needed. The minimum scalability requested in this configuration is 3,040 HD drives and minimum 32 PB of total capacity. |  |  |  |
| **1.11** | System supports following drives:  3.5-inch disk drives: 4 TB, 6 TB, 8 TB and 10 TB 7.2k nearline SAS disk;  2.5-inch disk drives: 600 GB and 900 GB 15k SAS drive, 600 GB, 900 GB, 1.2 TB, and 1.8 TB 10k SAS disk, 2 TB 7.2k nearline SAS disk  2.5-inch flash drives: 400 GB, 800 GB, 1.6 TB, 1.92 TB, 3.2 TB, 3.84 TB, 7.68 TB and 15.36 TB |  |  |  |
| **1.12** | Minimum 3x800GB, SSD 2.5" drives |  |  |  |
| **1.13** | Minimum 21x1.2TB, SAS 10K rpm 2.5" drives |  |  |  |
| **1.14** | Minimum 12x8 TB, NL SAS 7.2K rpm 2.5" drives |  |  |  |
| **1.15** | Supports following RAID levels: 0,1,5,6, 10 |  |  |  |
| **1.16** | On board internal storage capacity virtualization functionality |  |  |  |
| **1.17** | Supports automatic tiering technology and to be provided on the SSD and HDD drives without any other external device. This feature is provided in the proposed solution licensed for entire capacity available in the storage system. |  |  |  |
| **1.18** | Provides Thin Provisioning technology in the storage system without any other external device. This feature is provided in the proposed solution licensed for entire capacity available in the storage system |  |  |  |
| **1.19** | Able, with additional license, to provide virtualization of other storage systems without using any other external device or appliance |  |  |  |
| **1.20** | Certified for the following operating systems: Microsoft Windows, VMware ESX, Linux, IBM AIX, HP-UX, SUN Solaris |  |  |  |
| **1.21** | Has software for management thru WEB, CLI interface or dedicated management application |  |  |  |
| **1.22** | Delivered with minimum 8 FC cable at least 5 m long with LC connectors multimode needed for installation |  |  |  |
| **1.23** | Has function to replace controller units, power supply, and drives without interrupting system operation. |  |  |  |
| **1.24** | Supports remote data synchronisation and data replication with existing IBM Storwize v7000 GEN 1 storage system. This feature is provided in the proposed solution licensed for entire capacity available in the storage system. |  |  |  |
| **1.25** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions.  Three-year commercial warranty for hardware and software applications. |  |  |  |
| **2** | **Blade Chassis -** Lenovo FLEX System Enterprise chassis or equivalent **- Quantity – 1** |  |  |  |
| **2.1** | Height: Max 10U, rack mounted |  |  |  |
| **2.2** | Capacity: Up to 14 servers standard width, support for dual, four and eight socket servers in the chassis |  |  |  |
| **2.3** | Power: Six redundant, hot swap 2500W power supplies, 80 PLUS Platinum, N+1 or N+N redundancy |  |  |  |
| **2.4** | Cooling: Redundant fans built in for full chassis capacity |  |  |  |
| **2.5** | Management:  Two redundant modules for chassis and components management  Security policy management, role-based access control, TPM 2.0 support  Network server for management is 1Gb/s  Software for management with following functionalities:  discovery, inventory, monitoring, firmware updates, firmware compliance, configuration management, bare metal operating system image deployment (VMWare, RedHat, Windows)  Integration with VMWare vCenter and Microsoft System Center  Support for mobile (Android and iOS) management application |  |  |  |
| **2.6** | Ethernet modules:  Two redundant Layer 2/3 1Gb internal Ethernet switches  Support for RIP v1/v2, BGP-4, IGMP, OSPF v2, ACLs  VLAN-based, MAC-based, and IP based access control lists  Radius, TACACS+ and LDAP authentication and authorization  Aggregated throughput min. 176 Gbps, support for min. 1024 VLANs  100%-line rate, Jumbo frame support 9216  Support for QoS, switch partitioning (SPAR)  Total number of active ports per module (internal and external) min. 52 ports (28x internal 1 GbE ports, 20x external 1 GbE ports and 4x external 1GbE/10 GbE ports ) |  |  |  |
| **2.7** | Fibre channel modules:  Two redundant 16Gbit FC switches  Features included: Full fabric, Access Gateway, Advanced zoning,  Enhanced Group Management, Adaptive Networking  Media Supported: 16/8/4Gbps and 8/4/2Gbps Fibre Channel LC-style pluggable (SFP+) SWL (850 nm); data rate auto-sensing; hot pluggable;  end-to-end optics and link validation  Active ports: min. 12, expandable to at least 48 total ports  Included. 4 x 16Gb SFP+ modules per switch |  |  |  |
| **2.8** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **2.9** | Three-year commercial warranty. |  |  |  |
| **3.** | **Servers for blade chassis –**Lenovo FLEX system Server x240or equivalent –**Quantity: 5** |  |  |  |
| **3.1** | Processor :  Number of Processors: two  Processor 2 x (2.2GHz/12-core/105W) |  |  |  |
| **3.2** | Memory: 320GB TruDDR4 2400 MHz RDIMM, supported max capacity 1.5 TB RAM, 24 slots for memory DIMMs, support for memory mirroring and memory rank sparing |  |  |  |
| **3.3** | Systems management: Integrated systems management processor for communication with chassis management module, PFA on processors, memory, drives, voltage regulators, RAID controllers |  |  |  |
| **3.4** | Network adapter: 4 x port 1 GbitEthernet adapter |  |  |  |
| **3.5** | HBA adapter: 2 x port 16Gb fibre channel |  |  |  |
| **3.6** | Installed drives: 2 x 240GB SSD |  |  |  |
| **3.7** | Security: TPM module 1.2 |  |  |  |
| **3.8** | Supported operating systems: Windows 2016 Server, RedHat Enterprise Linux 7, Suse Linux Enterprise 12, VMWare ESX 6 |  |  |  |
| **3.9** | Compatible with existing chassis which is in use in MCA data centre (IBM Flex System Enterprise Chassis, Machine type 8721) |  |  |  |
| **3.10** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **3.11** | Three-year commercial warranty. |  |  |  |
| **4.** | **Backup server – Quantity: 1** |  |  |  |
| **4.1** | Form : Rackmount, Height 1U |  |  |  |
| **4.2** | Processor :  Number of Processors: two  Processor 2 x (2.1GHz/8-core/85W) |  |  |  |
| **4.3** | Memory: 16GB TruDDR4, supported max capacity 1.5 TB RAM, 24 slots for memory DIMMs, support for memory mirroring and memory rank sparing |  |  |  |
| **4.4** | Network adapter: 4 x port 1 Gbit ethernet adapter |  |  |  |
| **4.5** | HBA adapter: 2 x port 16Gb fibre channel |  |  |  |
| **4.6** | Installed drives: 3 x 1TB 7,2 NL SATA |  |  |  |
| **4.7** | Power: Redundant power supply |  |  |  |
| **4.8** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **4.9** | Three-year commercial warranty. |  |  |  |
| **5** | **Tape library – Quantity: 1** |  |  |  |
| **5.1** | Rack-mount tape library 2U form factor |  |  |  |
| **5.2** | Supports LTO Ultrium 7, 6 and 5 tape drive.  System supports data synchronisation and data replication with existing Tape Library PowerVault TL2000 LTO5. |  |  |  |
| **5.3** | Support up to two half-high tape drives |  |  |  |
| **5.4** | Number of cartridge slots: 24 tape cartridges |  |  |  |
| **5.5** | Support for path-failover with additional licence |  |  |  |
| **5.6** | Support for Transparent LTO Encryption |  |  |  |
| **5.7** | Total backup capacity:  LTO7: Up to 144 TB native; up to 360 TB compressed (with 2.5:1 compression)  LTO6: Up to 60 TB native; up to 150 TB compressed (with 2.5:1 compression)  LTO5: Up to 36 TB native; up to 72 TB compressed (with 2:1 compression) |  |  |  |
| **5.8** | Drive interfaces:  8 Gbps Fibre Channel  6 Gbps SAS interface |  |  |  |
| **5.9** | Data transfer rate (2 drives):  LTO7: Up to 600 MB/s native; up to 1.5 GB/s compressed (with 2.5:1 compression)  LTO6: Up to 320 MB/s native; up to 800 MB/s compressed (with 2.5:1 compression)  LTO5: Up to 280 MB/s native; up to 560 MB/s compressed (with 2:1 compression) |  |  |  |
| **5.10** | 2 x LTO 6 FC tape drives included |  |  |  |
| **5.11** | 20 x LTO 6 data cartridges included |  |  |  |
| **5.12** | 2 x cleaning cartages included |  |  |  |
| **5.13** | All necessary cables included |  |  |  |
| **5.14** | Management interfaces:  Operator panel  1x 10/100 Mb Ethernet port (UTP, RJ-45) for remote management: Web-based GUI;  SNMP and email notifications |  |  |  |
| **5.15** | Tape Drives supports reading existing LTO Ultrium 4 Data Cartridges. |  |  |  |
| **5.16** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **5.17** | Three-year commercial warranty. |  |  |  |
| **6** | **SERVER FIREWALL DEVICE -**Juniper SRX345or equivalent -  **Quantity: 2** |  |  |  |
| **6.1** | Memory: 4GM DRAM |  |  |  |
| **6.2** | Flash: 8 GB |  |  |  |
| **6.3** | Integrated power supply, rack mount device |  |  |  |
| **6.4** | Firewall IP throughput (IMIX type) 1600 Mbps minimum |  |  |  |
| **6.5** | Application secure firewall throughput: min. 1600 Mbps |  |  |  |
| **6.6** | Maximum concurrent sessions (IPv4 or IPv6) min. 375000 |  |  |  |
| **6.7** | Concurrent sessions per second 15.000 minimum |  |  |  |
| **6.8** | Unrestricted number of internal users |  |  |  |
| **6.9** | IPSEC VPN throughput (1400B traffic type) minimum 780Mbps |  |  |  |
| **6.10** | IPS (intrusion prevention system) throughput 590 Mbps |  |  |  |
| **6.11** | IPS sessions minimum 64000 |  |  |  |
| **6.12** | IPSEC tunnels minimum 2000 |  |  |  |
| **6.13** | Fixed I/O: 8 x 10/100/1000BaseTX Ethernet ports minimum, 8 x SFP ports minimum |  |  |  |
| **6.14** | Support for E1 and E3 through module addition |  |  |  |
| **6.15** | USB 2 support |  |  |  |
| **6.16** | IPsec VPN tunnels min. 2040 |  |  |  |
| **6.17** | IPsec VPN throughput (large packets):min. 800 Mbps |  |  |  |
| **6.18** | Support for MD-5, SHA-1 and SHA-2 (AES, DES, 3DES, SHA-256, SHA-384, and SHA-512) authentication,support for IKEv1 and IKEv2, support Auto VAN and Group VAN, support for Route Base VPN, support for RSA and ECDHE chippers |  |  |  |
| **6.19** | Remote access VPN support |  |  |  |
| **6.20** | Routing (Packet Mode 1518B traffic) PPS – 5500Mbps, Flow based routing support, Multicast support |  |  |  |
| **6.21** | Routing table size (RIB) minimum IPv4 1.000.000 routes |  |  |  |
| **6.22** | OSPF: full OSPF and OSPF v3 support |  |  |  |
| **6.23** | Static routing support |  |  |  |
| **6.24** | BGP: BGP support, BGP routing reflector supported |  |  |  |
| **6.25** | MPLS support: RSVP, LDP, L2/L3 MPLS VPN, pseudo wires, VPLS support |  |  |  |
| **6.26** | IPv6 support, IPv6 routing included, OSPFv3 minimum, IPv6 VPN support |  |  |  |
| **6.27** | Min 64 security zones supported |  |  |  |
| **6.28** | Virtual router support, minimum 127 VR supported |  |  |  |
| **6.29** | Support for 3000 VLANs minimum |  |  |  |
| **6.30** | Operational temperature: 0° to 40° C |  |  |  |
| **6.31** | Non-operational temperature: -20° to 70° C |  |  |  |
| **6.32** | QoS and VoIP support; Guaranteed bandwidth; Maximum bandwidth; DiffServ; H.323, MGCP, SCCP, SIP ALG supported; NAT for VoIP protocols |  |  |  |
| **6.33** | Management: full functional CLI (ssh, console), WebUI (HTTPS) |  |  |  |
| **6.34** | General support: NAT, PAT support; bridge groups support; L2 mode support (transparent firewall, L2 switching); L3 mode support (route) |  |  |  |
| **6.35** | DoS and DDoS protection, SYN cookie protection, Zone-based IP spoofing, TCP reassembly for fragmented packet protection, DoS and DDoS protection (Layer 3 and Layer 4) |  |  |  |
| **6.36** | Active/active failover configuration support; active/passive failover support; ASCII configuration support, Rescue configuration support, configuration rollback support, image rollback support, configuration synchronization, firewall session synchronization, In-Service Software Upgrade (ISSU), IP monitoring with route and interface failover |  |  |  |
| **6.37** | Application security support through software license upgrade (Application Tracking, Application FW, Application base Routing, Application base QoS) |  |  |  |
| **6.38** | IDP capabilities support through software license upgrade |  |  |  |
| **6.39** | Content security services supported by license upgrade (with activation code): Antivirus, Antispam, URL filtering (internal and external) |  |  |  |
| **6.40** | Service for Advanced threat detection, prevention and blocking of zero-day attacks supported through software licence upgrade |  |  |  |
| **6.41** | Capable to create L2 tunnels with existing server firewall which are in use in datacentre of Customs Administration (devices Juniper SRX240) |  |  |  |
| **6.42** | Official device registration on manufacturer’s web site for free software and firmware updates for a period of at least 1 year |  |  |  |
| **6.43** | Official manufacturer support for minimum 1 year |  |  |  |
| **6.44** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **6.45** | Two-year commercial warranty. |  |  |  |
| **7** | **PERIMETER FIREWALL DEVICE –** Juniper SRX340or equivalent-**Quantity: 2** |  |  |  |
| **7.1** | Memory: 4GM DRAM |  |  |  |
| **7.2** | Flash: 8 GB |  |  |  |
| **7.3** | Integrated power supply, rack mount device |  |  |  |
| **7.4** | Firewall IP throughput (IMIX type) 1100 Mbps minimum |  |  |  |
| **7.5** | Application secure firewall throughput: min. 1000 Mbps |  |  |  |
| **7.6** | Maximum concurrent sessions (IPv4 or IPv6) min. 256000 |  |  |  |
| **7.7** | Concurrent sessions per second 10.000 minimum |  |  |  |
| **7.8** | Unrestricted number of internal users |  |  |  |
| **7.9** | IPSEC VPN throughput (1400B traffic type) minimum 600Mbps |  |  |  |
| **7.10** | IPS (intrusion prevention system) throughput 400 Mbps |  |  |  |
| **7.11** | IPS sessions minimum 64000 |  |  |  |
| **7.12** | IPSEC tunnels minimum 1020 |  |  |  |
| **7.13** | Fixed I/O: 8 x 10/100/1000BaseTX Ethernet ports minimum, 8 x SFP ports minimum |  |  |  |
| **7.14** | Support for E1 and E3 through module addition |  |  |  |
| **7.15** | USB 2 support |  |  |  |
| **7.16** | IPsec VPN tunnels min. 1020 |  |  |  |
| **7.17** | IPsec VPN throughput (large packets):min. 600 Mbps |  |  |  |
| **7.18** | Support for MD-5, SHA-1 and SHA-2 (AES, DES, 3DES, SHA-256, SHA-384, and SHA-512) authentication,support for IKEv1 and IKEv2, support Auto VAN and Group VAN, support for Route Base VPN, support for RSA and ECDHE chippers |  |  |  |
| **7.19** | Remote access VPN support |  |  |  |
| **7.20** | Routing (Packet Mode 1518B traffic) PPS – 3000Mbps, Flow based routing support, Multicast support |  |  |  |
| **7.21** | Routing table size (RIB) minimum IPv4 1.000.000 routes |  |  |  |
| **7.22** | OSPF: full OSPF and OSPF v3 support |  |  |  |
| **7.23** | Static routing support |  |  |  |
| **7.24** | BGP: BGP support, BGP routing reflector supported |  |  |  |
| **7.25** | MPLS support: RSVP, LDP, L2/L3 MPLS VPN, pseudo wires, VPLS support |  |  |  |
| **7.26** | IPv6 support, IPv6 routing included, OSPFv3 minimum, IPv6 VPN support |  |  |  |
| **7.27** | Min 64 security zones supported |  |  |  |
| **7.28** | Virtual router support, minimum 64 VR supported |  |  |  |
| **7.29** | Support for 2000 VLANs minimum |  |  |  |
| **7.30** | Operational temperature: 0° to 40° C |  |  |  |
| **7.31** | Non-operational temperature: -20° to 70° C |  |  |  |
| **7.32** | QoS and VoIP support; Guaranteed bandwidth; Maximum bandwidth; DiffServ; H.323, MGCP, SCCP, SIP ALG supported; NAT for VoIP protocols |  |  |  |
| **7.33** | Management: full functional CLI (ssh, console), WebUI (HTTPS) |  |  |  |
| **7.34** | General support: NAT, PAT support; bridge groups support; L2 mode support (transparent firewall, L2 switching); L3 mode support (route) |  |  |  |
| **7.35** | DoS and DDoS protection, SYN cookie protection, Zone-based IP spoofing, TCP reassembly for fragmented packet protection, DoS and DDoS protection (Layer 3 and Layer 4) |  |  |  |
| **7.36** | Active/active failover configuration support; active/passive failover support; ASCII configuration support, Rescue configuration support, configuration rollback support, image rollback support, configuration synchronization, firewall session synchronization, In-Service Software Upgrade (ISSU), IP monitoring with route and interface failover |  |  |  |
| **7.37** | Application security support included: Application Tracking, Application FW, Application base Routing, Application base QoS |  |  |  |
| **7.38** | IDP capabilities support included |  |  |  |
| **7.39** | Content security services included: Antivirus, Antispam, URL filtering (internal and external) |  |  |  |
| **7.40** | Service for Advanced threat detection, prevention and blocking of zero-day attacks included |  |  |  |
| **7.41** | Capable to create L2 tunnels with existing server firewall which are in use in datacentre of Customs Administration (devices Juniper SRX240) |  |  |  |
| **7.42** | Official device registration on manufacturer’s web site for free software and firmware updates for a period of at least 1 year |  |  |  |
| **7.43** | Official manufacturer support for minimum 1 year |  |  |  |
| **7.44** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **7.45** | Two-year commercial warranty. |  |  |  |
| **8** | **L2 SWITCHING SYSTEM  -**Juniper EX2300 or equivalent –**Quantity: 5** |  |  |  |
| **8.1** | L2/L3 switching device |  |  |  |
| **8.2** | Rackable 1U; Flash and Memory: min 512 MB DRAM, 1 GB Flash storage |  |  |  |
| **8.3** | Stackable, up to 4 devices per stack |  |  |  |
| **8.4** | Interfaces: 24 ports 10/100/1000, auto-sense; minimum 4 separate SFP ports; serial console port |  |  |  |
| **8.5** | Data rate minimum 128Gbps |  |  |  |
| **8.6** | Throughput minimum 95 Mbps wire-speed |  |  |  |
| **8.7** | Supported 802.1D, 802.1ab,802.1w and 802.1Q, 802.1p; minimum 1024 VLANs; VLAN stacking support; Port and MAC based VLAN; MC-LAG support |  |  |  |
| **8.8** | Support for DHCP relay; support for SNMP, RMON; Jumbo frame support 9216 bytes; 802.1X support; L2 QoS, L3 QoS |  |  |  |
| **8.9** | Minimum 16000 hardware MAC address per device support |  |  |  |
| **8.10** | InterVLAN routing support; static routing, 4096 IPv4 hardware host routes minimum; RIP support; OSPF support; 1500 ARP entries minimum |  |  |  |
| **8.11** | Port, VLAN and Router based ACL support; MAC limiting 802.1X support |  |  |  |
| **8.12** | Traffic mirroring: port, VLAN or ACL based |  |  |  |
| **8.13** | Link aggregation support LACP |  |  |  |
| **8.14** | Support for RIPv1/v2, OSPFv1/v2, IGMP v1/v2/v3, Protocol Independent Multicast (PIM), IEEE 802.1 Q-in-Q, Bidirectional Forwarding Detection (BFD), Virtual Router Redundancy Protocol (VRRP) and Virtual Router / VRF-Lite with additional licence upgrade |  |  |  |
| **8.15** | Management: Full featured CLI (console, SSH) and web GUI interface |  |  |  |
| **8.16** | Rescue configuration support; rollback support for image and configuration file |  |  |  |
| **8.17** | Environment: Operating temperature range 0–45 °C, relative humidity operating 10% – 85% |  |  |  |
| **8.18** | Official device registration on manufacturer’s web site for free software and firmware updates for a period of at least 1 year |  |  |  |
| **8.19** | Official manufacturer support for minimum 1 year |  |  |  |
| **8.20** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **8.21** | Two-year commercial warranty |  |  |  |
| **9.** | **REMOTE ACCESS SYSTEM  -Quantity: 1** |  |  |  |
| **9.1** | 1U rackable form factor appliance |  |  |  |
| **9.2** | 3 x 1Gbps Ethernet interfaces, 1 dedicated management port |  |  |  |
| **9.3** | Support for 2500 SSL concurrent users, licence for 100 SSL users included |  |  |  |
| **9.4** | 550Mbps VPN SSL/TLS throughput minimum, 2500 concurrent users |  |  |  |
| **9.5** | 8GB RAM minimum, 500GB HDD |  |  |  |
| **9.6** | Centralized management using webUI, serial management interface integrated on devices |  |  |  |
| **9.7** | Simple AAA (authentication, authorization, and accounting) integration with existing systems for authentication/authorisation including Windows AD, LDAP, RADIUS, RSA, SAML, certificate, OTP |  |  |  |
| **9.8** | Support for remote user authentication implementation using a wide range of authentication mechanisms, including hardware token, smart card, soft token, one-time passwords and certificate authentication |  |  |  |
| **9.9** | Dual-transport (SSL + Encapsulating Security Payload) full Layer 3 VPN connectivity with granular access control supported |  |  |  |
| **9.10** | Client/Server proxy application included, for the purpose of secure information transfer. Application must create a "tunnel" from a specific application to a defined destination with support for Windows based devices. |  |  |  |
| **9.11** | The ability to evaluate remote user's device and report any problems before verifying the authenticity. Support for Windows, Mac OS X, Apple iOS, Android, Windows Mobile 6.5 |  |  |  |
| **9.12** | Split-tunnel option supported |  |  |  |
| **9.13** | Existing Unique, integrated, remote access client that allows network access control (NAC) and dynamic VPN options for remote users |  |  |  |
| **9.14** | Clientless core Web support and access to web based application support |  |  |  |
| **9.15** | RDP through HTML5 delivery support |  |  |  |
| **9.16** | Support for L7 web single sign-on using SAML SSO |  |  |  |
| **9.17** | Support for Kerberos Constrained Delegation, Kerberos SSO and support for NT LAN manager |  |  |  |
| **9.18** | Integration of user accounts with LDAP, Win AD etc. supported |  |  |  |
| **9.19** | Cross-platform support for widely used client platforms, minimum Windows, MAC OS X and Linux |  |  |  |
| **9.20** | Cross-platform support for widely used mobile platforms including minimum iOS, Android and Windows mobile |  |  |  |
| **9.21** | Dynamic role mapping support, with dynamic combination of attributes on per-session basis |  |  |  |
| **9.22** | Multiple sessions per user support |  |  |  |
| **9.23** | Support for IPSEC/IKEv2 services, certificates or user/passwords authentification |  |  |  |
| **9.24** | VMWare View Manager support |  |  |  |
| **9.25** | Support for ActiveSync Proxy, up to 5000 concurrent sessions |  |  |  |
| **9.26** | Support for SAM (Secure Application Manager) |  |  |  |
| **9.27** | NC (Network Connect) support |  |  |  |
| **9.28** | Environment: Operational temperature range 0–40 °C |  |  |  |
| **9.29** | Official device registration on the manufacturer's website for the purpose of free software and firmware updates for a period of at least 1 year |  |  |  |
| **9.30** | Manufacturer’s official support for a period of at least 1 year |  |  |  |
| **9.31** | Warranty shall remain valid for 1 year after provisional acceptance, in accordance with Article 32 of the General Conditions. |  |  |  |
| **9.32** | Two-year commercial warranty. |  |  |  |
| **10** | **Training - Quantity: 1** |  |  |  |
| **10.1** | Three working days training for two systems engineers nominated by the beneficiary Customs Administration, after installation of Storage and Server platform at Customs Administration.  Training, as a minimum, must address following topics:   * introduction to the system * utilization and technical handling of the equipment and basic equipment operations * overall usage of software for virtualisation   Training and training materials must be delivered in Montenegrin.Related translation and/or interpretation costs, if any, are borne by the Contractor. |  |  |  |
| **10.2** | Three working days training for two system engineers nominated by the Customs Administration, after installation of network and security devices at Customs Administration current HQ location in Podgorica. Training must include introduction to the system, basic administrator operations and procedures and security policy setting on security devices.  Training and training materials must be delivered in Montenegrin. Related translation and/or interpretation costs, if any, are borne by the Contractor. |  |  |  |