**TECHNICAL SPECIFICATION FOR THE PURCHASE OF SERVERS AND NETWORK EQUIPMENT**

1. **General requirements.**
   1. The procurement shall consist of **data centre blade-type servers, SAN switches and switching cables (hereinafter - 'the Goods')** with the required parameters set out in Table 1 and Table 2.
   2. **The work** to be procured shall be the **installation and configuration of the Goods (hereinafter - "the Works")**, the requirements of which are set out in Table 3. The Works shall be carried out in Vilnius and Kaunas, subject to adjustment during the implementation of the Contract.
   3. Goods must be presented new and unused, in the original manufacturer's packaging.
   4. The Goods must be covered by the manufacturer's warranty for at least 5 years from the date of signing of the acceptance/delivery act, with work to be carried out at the location of the equipment in Lithuania.
   5. All Goods must be brand new, unused and delivered in its original factory packaging. Factory refurbished "renewed", "refurbished", "remarked" components are not allowed.
   6. The hardware components (processor, memory, disks, adapters, power supply, etc.) that make up the servers must be fully assembled at the manufacturer's factory and bear the server manufacturer's trademarks.
   7. All equipment proposed for the solution must be certified by one or more manufacturers for joint operation (please provide information to support this).
   8. The proposed server platform shall allow third-party orchestration products to configure, manage and monitor the proposed server platform, servers and I/O modules using APIs (RedFish, Ansible, Puppet, Terraform).
   9. The proposed equipment must comply with the EU Directive 2019/424 Ecodesign for Servers, which sets strict standards for energy efficiency, packaging materials, circular economy, and environmental impact reduction.
   10. All packaging of the Goods left after delivery and installation of the Goods shall be disposed of in accordance with the applicable legislation of the Republic of Lithuania and the environmental protection requirements, at the Supplier's expense. Secondary and tertiary packaging in which the Goods are supplied shall be considered recyclable packaging in accordance with the provisions of the Environmental Pollution Tax Law of the Republic of Lithuania. The Supplier undertakes to collect and reuse or recycle the packaging. The Supplier shall provide with the Goods a document proving that secondary and tertiary packaging (if used) is recyclable.
   11. The energy consumption requirements of the goods are no worse than Energy Star 3 (or equivalent) certification. Information on certification is available on the [www.eu-energystar.org](http://www.eu-energystar.org) website or in the documentation of computer manufacturers. Provide proof of compliance or links to the relevant website.
   12. The manufacturer of servers and SAN switches is obliged to ensure compliance with the European Union RoHS (Restriction of Hazardous Substances) Directives (2002/95/EC (RoHS 1), 2011/65/EU (RoHS 2), 2015/863 (RoHS 2 amendment)), which prohibit the use of environmentally hazardous substances and substances hazardous to human health in production (e.g. mercury, cadmium, lead, hexavalent chromium, as well as flame retardants). The supplier shall provide evidence of compliance with the RoHS requirements: a copy of the manufacturer's declaration of conformity or a link to the manufacturer's website.
   13. The hardware shall operate without malfunction at a temperature between +10 ºC and +30 ºC in the room where the hardware is installed and at a relative humidity of 70% or less (unless otherwise specified).
   14. The Goods shall be delivered to the Purchasing Entity no later than 14 weeks from the date of entry into force of the Contract at in Vilnius and Kaunas. The delivery address will be specified during the implementation of the contract. The Works shall be completed within 1 month from the date of delivery.
   15. The Goods must be accompanied by detailed descriptions of technical parameters in Lithuanian and/or English.
   16. When submitting a tender, the supplier must fill in the column „Compliance with requirements“, indicating the specific size/value, function, performance or characteristic of the proposed goods, and marking the page or other reference in the tender where, in the descriptions of the goods or in any other technical documentation, this parameter, function, performance or characteristic is indicated to confirm the conformity of the proposed goods with the requirements of the technical specifications.
2. In order to demonstrate compliance with the requirements set out in Table 4, the supplier must complete the column "Compliance with requirements " and provide:
   1. where the person who maintains and supports the equipment concerned, the manufacturer or the person controlling it is a legal person, a copy of the instruments of incorporation of the legal person, certified by the head of the legal person, an extract from the register of legal persons, including the history of the legal person, or relevant documents from a Member State or a third country;
   2. if the person who carries out the maintenance and support of the equipment concerned, the manufacturer or the person who controls him is a natural person, a copy of his identity document (ID card or passport), a copy of the document certifying his authorisation to engage in the relevant economic activity (e.g. a business licence, a self-employed person's certificate, etc.), and a certificate of his declared residence or the relevant documentation from a Member State or third country.

Annex 1 to the Technical Specification

**Table 1. Parameters for Goods (Data Centre 1)**

**Table 1a: Blade chassis requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of servers supported in pcs. | Not less than 21 units. An adequate number of blade chassis shall be provided to ensure the specified number of servers supported. |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model: |  | Specify the exact model of the device |
| 1.3 | Key characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Power sources: | Each of the server receptacles shall be equipped with at least four hot-plug ~230 V 50 Hz power supplies with at least 96 % efficiency (Titanium) at 50 % load. It shall support N, N+1, N+2, N+N protection. The failure of one of the power supplies shall not affect the operation of the servers. The power supplies shall have sufficient power to fill the capacity of the servers with the servers proposed in Table 1b. |  |
| 1.5 | Cooling: | Each of the sever receptacles shall have at least four "hot-plug" duplicate cooling fans. The cooling capacity of the cooling fans shall be sufficient to fully fill the server cache with the servers proposed in Table 1b. |  |
| 1.6 | Control modules: | The blade chassis shall have integrated or external High Availability (HA) management modules. |  |
| 1.7 | I/O modules: | Duplicated LAN (Ethernet) and SAN (Fibre channel) network modules shall be provided for duplicated interconnection with the Purchasing Entity's existing LAN and the SAN switches to be purchased in Table 1c. There shall be a minimum of 2 units of 25G SFP28 LAN interfaces and a minimum of 2 units of 32G FC SAN interfaces per I/O module for each I/O module of the server cache. If the I/O or management modules of the servers centralised for all server hosts, then they shall have a minimum of 2 units of 100G LAN QSFP28 interfaces and 4 units of 32G FC SAN interfaces for each management module in the server hosts for connection to the Purchasing Entity's existing LAN switches and to the SAN switches to be purchased in Table 1c. |  |
| 1.8 | Equipment: | All necessary connecting cables, plug-in media modules, fasteners for the connection and installation of the equipment in the server racks of the contracting entity, power supply, LAN and SAN networks shall be provided.  The connectors for the power cables must be type C13-C14 or C19-C20 (the exact quantities of cables by type will be coordinated with the Contracting Authority during the preparatory work for equipment installation).  The server containers will be installed in server cabinets side by side, with the switches of the existing infrastructure up to 15 m away from the cabinets (the exact length depends on the proposed equipment and will be agreed before the installation of the equipment in the server cabinets). |  |
| 1.9 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.10 | Warranty requirements: | The server receptacle is covered by the manufacturer's 5-year warranty (24x7), with a maximum response time of 4 hours. Servicing of the equipment shall be carried out at the installation sites in Vilnius and Kaunas, the address to be specified during the implementation of the contract. All of the above requirements must be guaranteed by the manufacturer of the server receptacle. It shall be possible to check the level and validity of the warranty on the website of the equipment manufacturer. |  |

**Table 1b: Requirements for servers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of servers in pcs. | 17 |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model |  | Specify the exact model of the device |
| 1.3 | Main characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Processor architecture: | A workstation capable of hosting at least 2 Intel® Xeon® Scalable processors. It shall be an x86 architecture processor supporting 64-bit operating systems and applications, hardware-level virtualisation instructions, Hyper - Threading technology or equivalent, AVX-512 instructions.  Announcement date for the processor no earlier than 2023 Q3. |  |
| 1.5 | Processor performance: | Processor performance: shall be at least 680 units in the SPECrate2017\_int\_base test and at least 825 units in the SPECrate2017\_fp\_base test for a dual processor system. The results shall be made publicly available on <https://www.spec.org> and shall be included in the proposal. The performance results provided must be measured by the proposed workstation manufacturer for any workstation model with the proposed material processor. |  |
| 1.6 | Number of processors: | No more than 2 units per server. Not less than 24 and not more than 32 cores per processor. |  |
| 1.7 | Operational memory: | At least 2048GB per server, DDR5 RDIMM 5600MT/s memory.  Memory modules shall be of equal capacity and evenly distributed in the slots.  Advanced ECC support. |  |
| 1.8 | Hypervisor controller and disks: | The Hypervisor Controller shall be compatible with VMware ESXi 7 or later, compatibility available at <https://www.vmware.com/resources/compatibility/>; compatible with Red Hat Enterprise Linux 8.6, Red Hat OpenShift Container Platform 4.11, Red Hat OpenStack Platform 17.0, Red Hat Virtualization 4.4 or later, compatibility available at <https://catalog.redhat.com/hardware/system>; compatible with Windows Server 2019 or later, compatibility available at <https://www.windowsservercatalog.com>.  The deployment shall include a SATA, SAS or NVME controller, support RAID 1, with a minimum of 2 units of the appropriate media type, each with a capacity of at least 480 GB. |  |
| 1.9 | Server chassis requirements | A blade server to be installed in the blade chassis proposed in Table 1a. |  |
| 1.10 | Grid panels: | It shall provide a minimum of 25 Gb Ethernet and 32 Gb FC connectivity to each of the I/O modules in Table 1a of the Server Cache. May be a unified adapter supporting Ethernet, FC and management with a minimum speed of 100 Gb for connection to each of the I/O modules in Table 1a of the server cache. |  |
| 1.11 | Video controller: | Must be integrated. |  |
| 1.12 | Power sources: | Server catering shall be provided by the server cache. |  |
| 1.13 | Cooling: | Cooling of the server shall be provided by the server storage tank. |  |
| 1.14 | Management system: | There shall be a management controller independent of the OS. The Ethernet connection shall be secured with a 128-bit key (SSL or TLS). The management controller shall support a remote management console with ODD. The management controller shall receive and log messages about deviations in the performance of the CPU, memory, disk controller, disks and other parts of the server system. It shall support the sending of automatic notification of system failures by e-mail (SMTP), sending data to the monitoring system (SNMP V3 or higher). The management controller shall support firmware updates of the server components.  KVM over IP functionality shall be available (graphical interface independent of the operating system, virtual graphical console, management of virtual local CD-ROM devices).  All licences required for full remote control functionality of the server must be provided.  The software shall be capable of centralised administration of all the proposed servers. The software shall integrate with VMware vCenter, monitor, manage and centrally update all servers, and support rapid server installation using templates.  All software offered must be valid for at least 5 years. |  |
| 1.15 | Equipment: | All necessary connecting cables, connectors, fasteners and means for connecting and installing the equipment in the server receptacle proposed in Table 1a shall be provided. |  |
| 1.16 | Security: | Must have digitally signed firmware, Secure BIOS Recovery, System Lock Down, or equivalent functionality that restricts users' rights to change workstation settings, Chassis Intrusion Detection, Hardware Roots of Trust. |  |
| 1.17 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.18 | Encoding: | TPM 2 safety chip. |  |
| 1.19 | Warranty requirements: | The sever is covered by a manufacturer's warranty of 5 years (24x7) and a maximum response time of 4 hours. The equipment shall be serviced at the installation sites in Vilnius and Kaunas, the address to be specified during the implementation of the contract. Replacement of hard disks, memory and processor if there is a Prefailure Warranty. All of the above must be guaranteed by the manufacturer of the server. It shall be possible to check the level and validity of the warranty on the equipment manufacturer's website. Defective drives must be retained by the Purchasing Entity (Keep Your Drive). |  |

**Table 1c: Requirements for SAN switches**

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| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of SAN switches in pcs. | 2 |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model: |  | Specify the exact model of the device |
| 1.3 | Main characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Installation: | Mounted in a standard 19" server rack.  No more than 1U high.  All necessary mounting hardware for installation in a standard 19" server cabinet shall be provided. |  |
| 1.5 | Power sources: | Duplicate, hot swap. |  |
| 1.6 | Cooling: | Duplicate, hot swap. Cooling direction is from the back of the switch towards the front (towards the switch interfaces (towards ports). |  |
| 1.7 | Port type and speed: | At least 32 Gbps, *Fibre Channel* type. |  |
| 1.8 | Number of ports: | At least 24 activated ports. |  |
| 1.9 | SFP modules: | SFP+ optical converters shall be provided for all activated ports: type SW, supporting speeds of 32, 16 and 8 Gbps. |  |
| 1.10 | Software: | Supplied with software to create logical *zoning zones*.  In addition, *ISL Trunking* or equivalent licences must be provided for all activated ports. |  |
| 1.11 | Management: | There shall be a separate dedicated 100/1000BASE-T and RS-232 serial interface. CLI, SNMP, TACACS+ shall be supported. All necessary software for monitoring and management of the switches shall be provided. |  |
| 1.12 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.13 | Warranty requirements: | SAN switches are backed by a manufacturer's warranty of 5 years (24x7) and a maximum response time of 4 hours. Equipment servicing shall be carried out at the installation sites in Vilnius and Kaunas, the address to be specified during the contract implementation. Replacement of hard disks, memory and processor if there has been a "Prefailure Warranty" warning of possible failure. All of the above must be guaranteed by the manufacturer of the SAN switches. It shall be possible to check the level and validity of the warranty on the equipment manufacturer's website. |  |

**Table 2. Parameters for Goods (Data Centre No 2)**

**Table 2a: Blade chassis requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of servers supported in pcs. | Not less than 21 units An adequate number of blade chassis shall be provided to ensure the specified number of servers supported. |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model: |  | Specify the exact model of the device |
| 1.3 | Main characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Power sources: | Each of the server receptacles shall be equipped with at least four hot-plug ~230 V 50 Hz power supplies with a minimum of 96 % efficiency (Titanium) at 50 % load. It shall support N, N+1, N+2, N+N protection. The failure of one of the power supplies shall not affect the operation of the servers. The power supplies shall have sufficient power to fill the capacity of the servers with the servers proposed in Table 2b. |  |
| 1.5 | Cooling: | Each of the server receptacles shall have at least four "hot-plug" duplicate cooling fans. The cooling capacity of the cooling fans shall be sufficient to fully fill the server cache with the servers proposed in Table 2b. |  |
| 1.6 | Control modules: | The blade chassis shall have integrated or external High Availability (HA) management modules. |  |
| 1.7 | I/O modules: | Duplicated LAN (Ethernet) and SAN (Fibre channel) network modules shall be provided for duplicated interconnection with the Purchasing Entity's existing LAN and the SAN switches to be purchased in Table 1c. There shall be a minimum of 2 units of 25G SFP28 LAN interfaces and a minimum of 2 units of 32G FC SAN interfaces per I/O module for each I/O module of the server cache. If the I/O or management modules of the servers centralised for all server hosts, then they shall have a minimum of 2 units of 100G LAN QSFP28 interfaces and 4 units of 32G FC SAN interfaces for each management module in the server hosts for connection to the Purchasing Entity's existing LAN switches and to the SAN switches to be purchased in Table 1c. |  |
| 1.8 | Equipment: | All necessary connecting cables, plug-in media modules, fasteners for the connection and installation of the equipment in the server racks of the contracting entity, power supply, LAN and SAN networks shall be provided.  The connectors for the power cables must be type C13-C14 or C19-C20 (the exact quantities of cables by type will be coordinated with the Contracting Authority during the preparatory work for equipment installation).  The server containers will be installed in server cabinets side by side, with the switches of the existing infrastructure up to 15 m away from the cabinets (the exact length depends on the proposed equipment and will be agreed before the installation of the equipment in the server cabinets). |  |
| 1.9 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.10 | Warranty requirements: | The server is covered by a manufacturer's warranty of 5 years (24x7) and a maximum response time of 4 hours. The equipment shall be serviced at the installation sites in Vilnius and Kaunas, the address to be specified during the implementation of the contract. All of the above requirements must be guaranteed by the manufacturer of the server receptacle. It shall be possible to check the level and validity of the warranty on the website of the equipment manufacturer. |  |

**Table 2b: Requirements for servers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of servers in pcs. | 15 |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model: |  | Specify the exact model of the device |
| 1.3 | Main characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Processor architecture: | A workstation capable of hosting at least 2 Intel® Xeon® Scalable processors. It shall be an x86 architecture processor supporting 64-bit operating systems and applications, hardware-level virtualisation instructions, Hyper - Threading technology or equivalent, AVX-512 instructions.  Announcement date for the processor no earlier than 2023 Q3. |  |
| 1.5 | Processor performance: | Processor performance: shall be at least 680 units in the SPECrate2017\_int\_base test and at least 825 units in the SPECrate2017\_fp\_base test for a dual processor system. The results shall be made publicly available on <https://www.spec.org> and shall be included in the proposal. The performance results provided must be measured by the proposed workstation manufacturer for any workstation model with the proposed material processor. |  |
| 1.6 | Number of processors: | No more than 2 units per server. Not less than 24 and not more than 32 cores per processor. |  |
| 1.7 | Operational memory: | At least 2048GB per server, DDR5 RDIMM 5600MT/s memory.  Memory modules shall be of equal capacity and evenly distributed in the slots.  Advanced ECC support. |  |
| 1.8 | Hypervisor controller and disks: | The Hypervisor Controller shall be compatible with VMware ESXi 7 or later, compatibility available at <https://www.vmware.com/resources/compatibility/>; compatible with Red Hat Enterprise Linux 8.6, Red Hat OpenShift Container Platform 4.11, Red Hat OpenStack Platform 17.0, Red Hat Virtualization 4.4 or later, compatibility available at <https://catalog.redhat.com/hardware/system>; compatible with Windows Server 2019 or later, compatibility available at <https://www.windowsservercatalog.com/>.  The deployment shall include a SATA, SAS or NVME controller, support RAID 1, with a minimum of 2 units of the appropriate media type, each with a capacity of at least 480 GB. |  |
| 1.9 | Server chassis requirements: | A Blade server to be installed in the blade chassis proposed in Table 1a. |  |
| 1.10 | Network panels: | It shall provide a minimum of 25 Gb Ethernet and 32 Gb FC connectivity to each of the I/O modules in Table 1a of the Server Cache. May be a unified adapter supporting Ethernet, FC and management with a minimum speed of 100 Gb for connection to each of the I/O modules in Table 1a of the server cache. |  |
| 1.11 | Video controller: | Must be integrated. |  |
| 1.12 | Power sources: | Server catering shall be provided by the server cache. |  |
| 1.13 | Cooling: | Cooling of the server shall be provided by the server storage tank. |  |
| 1.14 | Management system: | There shall be a management controller independent of the OS. The Ethernet connection shall be secured with a 128-bit key (SSL or TLS). The management controller shall support a remote management console with ODD. The management controller shall receive and log messages about deviations in the performance of the CPU, memory, disk controller, disks and other parts of the server system. It shall support the sending of automatic notification of system failures by e-mail (SMTP), sending data to the monitoring system (SNMP V3 or higher). The management controller shall support firmware updates of the server components.  KVM over IP functionality shall be available (graphical interface independent of the operating system, virtual graphical console, management of virtual local CD-ROM devices).  All licences required for full remote control functionality of the server must be provided.  The software shall be capable of centralised administration of all the proposed servers. The software shall integrate with VMware vCenter, monitor, manage and centrally update all servers, support fast server installation using templates.  All software offered must be valid for at least 5 years. |  |
| 1.15 | Equipment: | All necessary connecting cables, connectors, fasteners and means for connecting and installing the equipment in the server receptacle proposed in Table 2a shall be provided. |  |
| 1.16 | Security: | Must have digitally signed firmware, Secure BIOS Recovery, System Lock Down, or equivalent functionality that restricts users' rights to change workstation settings, Chassis Intrusion Detection, Hardware Roots of Trust. |  |
| 1.17 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.18 | Encoding: | TPM 2 safety chip. |  |
| 1.19 | Warranty requirements: | The server is covered by a manufacturer's warranty of 5 years (24x7) and a maximum response time of 4 hours. The equipment shall be serviced at the installation sites in Vilnius and Kaunas, the address to be specified during the implementation of the contract. Replacement of hard disks, memory and processor if there is a Prefailure Warranty. All of the above must be guaranteed by the manufacturer of the server. It shall be possible to check the level and validity of the warranty on the equipment manufacturer's website. Defective drives must be retained by the Purchasing Entity (Keep Your Drive). |  |

**Table 2c: Requirements for SAN switches**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **Name of component/characteristic** | **Required performance no worse than or equivalent (references to standards/technologies/brands are for guidance only and standards/technologies/brands may be replaced by equivalent ones)** | **Compliance with requirements (proposed characteristic, component model, manufacturing company)** |
| 1. | Number of SAN switches in pcs. | 2 |  |
| 1.1 | Manufacturer: |  | Specify the exact model of the device |
| 1.2 | Name/model: |  | Specify the exact model of the device |
| 1.3 | Key characteristics: | Provide a link to the manufacturer's website, the technical documentation that provides information on the main characteristics of the proposed product and its compliance with the technical specification. |  |
| 1.4 | Installation: | Mounted in a standard 19" server rack.  No more than 1U high.  All necessary mounting hardware for installation in a standard 19" server cabinet shall be provided. |  |
| 1.5 | Power sources: | Duplicate, hot swap. |  |
| 1.6 | Cooling: | Duplicate, hot swap. Cooling direction is from the back of the switch towards the front (towards the switch interfaces (towards ports). |  |
| 1.7 | Port type and speed: | At least 32 Gbps, *Fibre Channel* type. |  |
| 1.8 | Number of ports: | At least 24 activated ports. |  |
| 1.9 | SFP modules: | SFP+ optical converters shall be provided for all activated ports: type SW, supporting speeds of 32, 16 and 8 Gbps. |  |
| 1.10 | Software: | Supplied with software to create logical *zoning zones*.  In addition, *ISL Trunking* or equivalent licences must be provided for all activated ports. |  |
| 1.11 | Management: | There shall be a separate dedicated 100/1000BASE-T and RS-232 serial interface. CLI, SNMP, TACACS+ shall be supported. All necessary software for monitoring and management of the switches shall be provided. |  |
| 1.12 | Product Codes (Part Numbers): | A separate annex must contain the product codes (Part Number), a brief description and the quantities of all component parts. |  |
| 1.13 | Warranty requirements: | SAN switches are backed by a manufacturer's warranty of 5 years (24x7) and a maximum response time of 4 hours. Equipment servicing shall be carried out at the installation sites in Vilnius and Kaunas, the address to be specified during the contract implementation. Replacement of hard disks, memory and processor if there has been a "Prefailure Warranty" warning of possible failure. All of the above must be guaranteed by the manufacturer of the SAN switches. It shall be possible to check the level and validity of the warranty on the equipment manufacturer's website. |  |

**Table 3. Works**

|  |  |  |  |
| --- | --- | --- | --- |
| **Eil. No.** | **The required performance, function, fulfilment or characteristic of a device, product or material** | **Required value, implementation or property of a parameter (units of measure) or function** | **Compliance with requirements** |
|  | **Installation of data centre servers, SAN switches:** | Within 1 month of equipment delivery |  |
|  | Installation in telecommunications cabinets. Installation, connection and marking of power cables, data cables.  Number of Vilnius DC servers in pcs. | 17 |  |
|  | Installation in telecommunications cabinets. Installation, connection and marking of power cables, data cables.  Number of Kaunas DC servers in pcs. | 15 |  |
|  | **Data centre server configuration:** |  |  |
|  | Static IP addresses to be assigned to the control panels of the servers, according to the customer's data, pcs. | 32 |  |
|  | **Data centre SAN switch configuration:** |  |  |
|  | Static IP addresses shall be assigned to the management ports of SAN switches, according to the customer's data, pcs. | 4 |  |

**Table 4. Requirements for the compatibility of the subject of the procurement with national security interests**