

## 1. Scop

Scopul elaborării prezentului Caiet de Sarcini constă în definirea cerințelor tehnice, funcționale, operaționale și de securitate pentru proiectarea, furnizarea, implementarea și punerea în funcțiune a infrastructurii unui centru de date (Data Center), destinat asigurării funcționării continue, sigure și scalabile a sistemelor informaționale critice ale entității.

Documentul are drept obiectiv:

- stabilirea parametrilor tehnici minimi și obligatorii pentru infrastructura IT (servere, stocare, rețea, virtualizare, backup);
- definirea cerințelor privind disponibilitatea, redundanța și continuitatea operațională;
- descrierea cerințelor de securitate fizică și cibernetică;
- stabilirea condițiilor de interoperabilitate cu infrastructura existentă;
- definirea cerințelor privind monitorizarea, administrarea și mentenanța sistemelor;
- asigurarea conformității cu standardele și bunele practici aplicabile în domeniul centrelor de date.

Prezentul Caiet de Sarcini constituie baza tehnică pentru inițierea procedurii de achiziție și evaluarea ofertelor, în vederea selectării unei soluții care să corespundă necesităților operaționale actuale și viitoare ale entității.

<b>Nº</b>	<b>Marfa</b>	<b>Cantitatea buc.</b>
1.	<b>Infrastructura Servere pentru computing</b>	<b>6</b>
2.	<b>Sistem de stocare All Flash</b>	<b>2</b>
3.	<b>Sistem de stocare Backup</b>	<b>1</b>
4.	<b>Switch Ethernet pentru rețea de datacentru</b>	<b>4</b>
5.	<b>Switch Fibre Channel pentru rețea de datacentru</b>	<b>4</b>
6.	<b>Soft de virtualizare</b>	<b>1</b>

## 2. Caracteristici tehnice

<b>Infrastructura Centrului de Date</b>				
<b>Cod CPV</b>	<b>Denumirea bunurilor/serviciilor</b>	<b>Un. de masura</b>	<b>Cantitate</b>	<b>Specificarea tehnică deplină solicitată de către autoritatea contractantă</b>
<b>COMPARTIMENTUL SERVERE</b>				
<b>30232110-8</b>	<b>Infrastructura Servere pentru computing</b>	<b>buc</b>	<b>6</b>	Computing Server with following configuration: International well-known brand. Form-factor - Rack-mount max. 2U 2 x CPU min. 2.5GHz, max. 3.6GHz for all cores, min. 32Cores, min. 280MB cache, DDR5 RAM, 512GB DDR5-6400 RDIMM (8 x 64GB) installed, min. 32 slots available for RAM. Raid Controller with Raid 1 support. Boot disks min. 2 x 480GB NVMe SSD, used for hypervisor. Network card: 2 x 10/25Gb Intelligent Ethernet, RoCEv2, NVMe over TCP/VXLAN/VLAN offload support, 2x

				<p>cables Active Optical Cable 10/25Gb SFP28 3 meters included.</p> <p>Fibre Channel HBA card: 2 x 32Gb SFP+ ports, NVM over FC/iSCSI FC, multipath, NPIV, AES-256 encryption, 2 x 32Gb SFP+ short-wave transceivers included.</p> <p>Security: hardware TPM Module 2.0 included.</p> <p>Up to 3 x 16 PCI Express 5.0 and 2 x OCP slots.</p> <p>Fans: Redundant hot-swap fans.</p> <p>Power Supply, Redundancy: 2 x min. 1600W, Platinum Efficiency, min 94%, hot swap. Power cords included.</p> <p>Dedicated management ethernet port, console port, min 2 x USB 3.0 ports.</p> <p>Management: Remote KVM for each server, centralized management for all servers from a single dashboard, updates (including firmware) policies, security policies, operation automation and orchestration with license included.</p> <p>Certifications: FIPS140-2 or FIPS140-3.</p> <p>Warranty: 3 years for software updates, hardware replacement on-site, support 24/24. Equipment must be registered at vendor support portal and attached to company profile for at least future access to support renewals, updates, notification, recommendations.</p>
<b>COMPARTIMENTUL STOCARE ŞI BACKUP</b>				
30232110-8	Sistem de stocare All Flash	set	1	<p>2 x Primary Storages with following configuration:</p> <p>International well-known brand.</p> <p>All Flash Storage System, NVMe.</p> <p>Dual controller, with high availability and automatic failover.</p> <p>Chassis, 2U rackmount: dual controller and min. 24 x NVMe disk slots.</p> <p>Architecture: scalable and resilient architecture, clustered controllers with non-disruptive failover in case of failure or component updates.</p> <p>Supported types of disks: NVMe SSD TLC, NVMe SSD QLC.</p> <p>Disk included: min. 12 x 3.84TB NVMe SED disks, hot swap.</p> <p>Host ports per controller: min. 4 x 10/25Gb Ethernet with support of NVMe over TCP with 4 x 25Gb SFP28 SR 100m modules included; min. 4 x 32Gb Fibre Channel ports with 4 x 32Gb SFP+ short-wave modules included.</p> <p>Cache size per controller: min. 256GB.</p> <p>Extendable up to 2PB raw space.</p> <p>Extension disk shelves: up to 2 shelves over 2 x 100Gb NVMe over Fabric back-</p>

				<p>end ports. At least 2 back-end ports per controller should be included.</p> <p>Storage protocols included: NVMe over TCP, NVMe over FC, Block (at least iSCSI, FC), NAS (at least NFSv4).</p> <p>Storage features included: storage space efficiency mechanisms (data deduplication and compression), thin provisioning, LUN/Volume resize, LUN/Volume clone, LUN/Volume QoS, Active-Active Metro cluster for at least NVMe over FC, NVMe over TCP and Block protocols, replication (synchronous and asynchronous), antiransomware in-line protection for at least block volumes with alerting to external SIEM or monitoring system. All features must be covered with licenses.</p> <p>Redundancy: dual controller, redundant fans, power supply, management.</p> <p>Management and monitoring: Monitoring and management solution included for day one operation and activity, providing at least: performance indicators (latency, IOPS, throughput) for storage node, disks, cache, host ports, volumes/shares, alerts, proactive actions.</p> <p>Certifications: FIPS140-2 or FIPS140-3.</p> <p>Warranty: 3 years for software updates, hardware replacement on-site, vendor support 24/24 with 15 mins call back and 4 hours on-site arrival. Equipment must be registered at the vendor support portal and attached to the company profile for at least future access to support renewals, updates, notification, recommendations.</p>
30232110-8	Sistem de stocare Backup	buc	1	<p>Backup Storage with following configuration:</p> <p>International well-known brand.</p> <p>Chassis, 2U rackmount: min. 12 x3.5" SATA disk slots.</p> <p>Supported types of disks: SATA SSD, SATA HDD.</p> <p>Extendable up to 36 disks by using expansion units.</p> <p>RAM for OS and cache: min. 32GB.</p> <p>Disk included: min. 12 x 14TB SATA disks, 512MB cache, NAS series, hot swap.</p> <p>Included 2 x M.2/SATA/SAS/NVMe 500GB SSD disks for acceleration.</p> <p>Network ports: min. 2 x 10Gb SFP+ Ethernet, 4 x 1Gb RJ45, LACP/VLAN support,</p> <p>HBA ports: min. 2 x 16Gb SFP+ Fibre Channel ports with 2 x 16Gb SFP+ short-wave transceivers included.</p> <p>Min 2 x Back-end expansion ports for expansion units.</p>

				<p>Min 2 x expansion slots for additional cards: LAN, SSD Cache.</p> <p>Redundant power supplies with power cords included.</p> <p>Raid 1,5,6,10 support.</p> <p>Up to 200TB single volume size.</p> <p>Encryption of volumes with AES-256.</p> <p>Storage protocols included: Block (at least iSCSI) and NAS (at least NFSv4, SMB).</p> <p>Integration with existing Backup platform Veeam Backup via NFS, SMB, iSCSI, FC.</p> <p>Warranty: 3 years for software updates, hardware replacement on-site, vendor support.</p>
<b>COMPARTIMENTUL REȚEA ȘI CONECTIVITATE</b>				
30232110-8	Switch Ethernet pentru rețea de datacentru	buc	4	<p>Data Center network switch</p> <p>International well-known brand.</p> <p>Chassis: rackmount chassis 19" with included rackmount kit.</p> <p>Architecture: redundant, non-blocking ports, low latency performance with L2 and advanced L3 routing protocols included.</p> <p>Ports: min. 48x10/25Gb SFP28 ports, 6x40/100Gb QSFP28 ports.</p> <p>Included SFP: min. 24x10/25Gb SFP28 LR 10km modules, min. 8x10/25Gb SFP28 SR 100m modules, min. 2x100Gb QSFP28 LR 10km module, min. 2x100Gb QSFP28 AOC 3m module.</p> <p>Performance: min. 3.6Tbps, min 1.2Bpps, lossless ethernet.</p> <p>Routing: min. 1 000 000 IPv4 routes.</p> <p>Packet buffer: min. 40MB</p> <p>Included features: Routing (BGP, OSPF, IS-IS) overlay (VXLAN EVPN)</p> <p>VLAN tagg. (802.1Q),LACP; Trunking; STP, RSTP, MSTP; Link Aggregation, vPC or equivalent; MACSec (AES-256) on all ports included; UDLD, DCBX, RoCEv2, QoS.</p> <p>Licenses: perpetual.</p> <p>Management: dedicated console port, 1x100/1000Base-T out-of-band</p> <p>Redundancy: (1+1) hot swappable PSU, FANs (N+1).</p> <p>Certifications: FIPS140-2 or FIPS140-3.</p> <p>Warranty: 3 years for software updates, hardware replacement Next Business Day, vendor support. Equipment must be registered at vendor support portal and attached to company profile for at least future access to support renewals, updates, notification, recommendations., certificat CE/ISO</p>

30232110-8	Switch Fibre Channel pentru rețea de datacentru	buc	4	Storage Area Network (SAN) Fibre Channel switch
				International well-known brand.
				Chassis: rackmount chassis 19" with included rackmount kit.
				Architecture: redundant, non-blocking ports, low latency performance.
				Ports: min. 24x64Gb SFP+ ports, at least 8 ports should be with the activated license.
				Included SFP: min. 8 x 32Gb or 64Gb SFP+ short-wave transceivers, min 1 x 64Gb SFP+ long-wave 10km transceiver. All transceivers should be original and certified by switch vendor.
				Included features: AES-256 in-flight hardware encryption, NVMe over FC, NPV, VSAN, ISL, FEC, QoS.
				Licenses: min 3 years of subscription for all requested features.
				Management: dedicated console port, 1x100/1000Base-T out-of-band
				Redundancy: (1+1) hot swappable PSU, FANs (N+1).
				Certifications: FIPS140-2 or FIPS140-3.
Warranty: 5 years for software updates, hardware replacement Next Business Day, vendor support. Equipment must be registered at vendor support portal and attached to company profile for at least future access to support renewals, updates, notification, recommendations., certificat CE/ISO				
<b>COMPARTIMENTUL SOFT</b>				
30232110-8	Soft de virtualizare	buc	1	The Virtualization software should be of bare-metal type and support hardware-based virtualization on CPU's of the proposed computing servers.
				The Virtualization software should be certified by vendor for running on the proposed servers.
				The Virtualization software should support the following Guest operating systems: Windows Server 2016, 2019, 2022, 2025; SUSE Linux, Ubuntu Linux, Red Hat Enterprise Linux, CentOS Linux, Microsoft Windows 11 Pro.
				The virtualization software should support proposed Primary Storage Metro cluster via at least NVMe over FC protocol.
				The virtualization software should support datastores on external storage via iSCSI, FC, NFSv4.
				The management console of the virtualization system should support High Availability mode in active-passive or active-active mode.

				<p>The virtualization software should support the following features: Virtual Machine HA, Virtual Machine Live migration, Distributed Switch, Distributed Resource Scheduler, VM snapshots, vTPM2.0.</p> <p>The virtualization software should support migration of a running Virtual Machines from one Host to another with zero downtime.</p> <p>The virtualization software should support execution of scripts (shell, bash, powershell, etc) during the VM provisioning or maintenance.</p> <p>The virtualization software should support migration of a running Virtual Machines from one datastore to another with zero downtime.</p> <p>The virtualization software should natively support the creating of storage-based snapshots of VMs on the Primary Storage Metro cluster.</p> <p>The virtualization software should be natively intergated with esxisting Veeam Backup software.</p> <p>The virtualization software should support Multi-factor Authentication and integration with Microsoft Windows Active Directory.</p> <p>The virtualization software should be licensed for all CPU cores or sockets installed in proposed computing servers. The license should be perpetual with 3 years support from vendor or subscription-based with included license for at least 5 years. Vendor support should have the SLA 24/7/365.</p>
<b>COMPARTIMENTUL LUCRĂRI ŞI SERVICII ASOCIATE</b>				
	<b>Lucrări de instalare şi configurare echipamente</b>	<b>set</b>	<b>1</b>	<p>Instalarea fizică a echipamentelor în rack-uri, conectarea alimentării electrice, etichetarea echipamentelor şi a cablurilor, configurarea serverelor şi a sistemului centralizat de management şi monitorizare a serverelor, configurarea primary storage în regim de metro cluster, configurarea sistemului de virtualizare, configurarea echipamentelor de reţea şi conectarea acestora la reţeaua aeroportului, configurarea unei fabrici VXLAN, VLAN, OSPF, BGP EVPN şi a regulilor de filtrare a traficului de reţea, configurarea a doua fabrici independente Fibre Channel, migrarea maşinilor virtuale si fizice din infrastructura existentă a aeroportului, configurarea sistemului de backup şi conectarea acestuia la hipervizor şi storage, testarea diferitelor scenarii de toleranţă la defect ale centrului de date.</p>

	<b>Instruire personal IT</b>	<b>ore</b>	<b>20</b>	Instruire tehnică pentru personal IT privind administrarea, monitorizarea și mentenanța platformei, certificat de participare.
	<b>Suport tehnic post-implementare</b>	<b>luni</b>	<b>12</b>	Suport la distanță/telefonic pentru întrebări, troubleshooting, consultanță, intervenții locale în caz de urgență timp de 12 luni după livrare în regim 24/24, inclus în garanție.

1. Statut de partener oficial în Republica Moldova al fiecărui producător al componentelor soluției oferite.
2. Autorizare de la fiecare producător al componentelor soluției oferite (MAF).
3. Min 1 proiect realizat în ultimii 3 ani cu produse similare, de complexitate similară și suma nu mai puțin decât 70% ale ofertei prezentate.