

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

**Contract title:** EU support for supply of equipment to IDDEEA

**Publication reference:** EuropeAid/140229/DH/SUP/BA

Tender number: EC/BiH/TEN/19/002

**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 on its proposed 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.

### 1. Minimum requirements and supporting documentation

- Tenderers are required to demonstrate that the offered specifications are responsive to the Tender Dossier requirements identifying model, manufacturer and country of origin of each individual item in their Technical Offer providing necessary documentation (catalogues, guides, brochures, manuals, booklets, etc.) with detailed technical specifications for all items being offered thus enabling the Contracting Authority to verify the information provided in the offer.
- Technical specifications described in column 2, Table Annex III: The Contractor's technical offer, are the **minimum** requirements. Tenderer may offer better specs, with improved, additional or new features, but must not provide offer not strictly complying with the minimum requirements.
- Notes, remarks, ref to documentation in column 4, Table Annex III: The Contractor's technical offer **should clearly indicate title of the supporting document**, so that evaluators can see the exact configuration.

### 2. Completeness of the supply

- Supply delivery, including installation, integration and final customization must include all needed accessories required for the supplies to be presented for provisional acceptance fully installed, operational and ready for use.
- Accessories, fixing, fittings, connections, joints, links, extensions, modules, software and legal licenses as well as documentation used during delivery, installation, integration and customization before provisional acceptance must therefore be anticipated and calculated into the offer.
- It shall be the sole responsibility of the Tenderer to ensure that all pre-requisites for the completeness of the supply delivery are met before its commencement.

### 3. Supply delivery

- The locations of delivery are provided in the table under section 4. The exact locality for each piece of equipment will be agreed with the beneficiaries at the time of the commencement of the delivery.
- The Tenderer must provide the necessary measures to prevent any damage during delivery stages. If any damage occurs during delivery the Tenderer must appropriately rectify it.

- Each single requirement that describes the specific item feature as well as all requirements describing overall item features have to be considered as describing feature(s) that have to come already pre-installed with or embedded within the item, meaning that they cannot be additionally nor externally added.

#### 4. Places of Delivery

Equipment and software have to be delivered, as follows:

No.	Location	Abbr.	Address	Note
1	The Agency for Identification Documents, Registers and Data Exchange, B&H.	IDDEEA, BIH	Kralja Petra I Karađorđevića 83A, 78000 Banja Luka, BiH	All equipment to be delivered

**Lot 1: Embossing press for licence plates and Hot stamping machine**

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
1.1.  4	<b>Embossing press for licence plates:</b> <ul style="list-style-type: none"> <li>• Embossing time maximum 5 s</li> <li>• Capacity, minimum 350 plates per hour</li> <li>• Embossing power, minimum 35 T (350 kN)</li> <li>• Power or control voltage 230 V/50Hz</li> <li>• Power consumption maximum 1,5 kW</li> <li>• Weight maximum 500 kg</li> <li>• Dimensions, maximum: 1960x1100x820 [mm]</li> <li>• Monitor touch panel (integrated in the machine with software for embossing process control – show preview of the next plate to emboss with the registration number)</li> <li>• RFID NFC readers for clapper dies recognition</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Clapper dies with RFID NFC tags: each clapper die has unique NFC tag, press allows to emboss license plate only when all clapper dies are in right order and on right positions</li> <li>Barcode reader: to emboss license plate each one has to have specified, unique barcode</li> <li>Card reader: access control to embossing press via logging operators to system using contactless card reader</li> <li>Signal tower: three colour signal tower: green, yellow and red (or other three colours) to signalize state of embossing press</li> <li>Clapper dies rack</li> <li>222 pieces appropriate clapper dies with NFC tags and tools compatible with Embossing press specified above and for each dimension of BiH license plates. Dimensions of the BiH licence plates are the following               <ol style="list-style-type: none"> <li>520x110 mm drawer:                   <ul style="list-style-type: none"> <li>(letters) 14 pcs,</li> <li>(numbers) 60 pcs “-“ 1 pcs</li> <li>Positioning tool 1 pcs</li> </ul> </li> </ol> </li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>b) 340x200 mm drawer: Top line:     (letters) 14 pcs,     (numbers) 20 pcs,     Positioning tool 1 pcs</p> <p>c) 240x130 mm drawer: Top line:     (letters) 14 pcs     (numbers) 20 pcs     Positioning tool 1 pcs</p> <p>Bottom line:     (numbers) 60 pcs     (letters) 14 pcs     “-“ 1 pcs     Positioning tool 1 pcs</p> <ul style="list-style-type: none"> <li>• Training for min. 6 persons and implementation with the system at place of delivery</li> <li>• License plates ordering software for the system with all Licence included and in compatibility with item 1.1.</li> <li>• Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
1.2.  2	<b>Hot stamping machine:</b> <ul style="list-style-type: none"> <li>• Maximum foiling width (working width) 125 mm</li> <li>• One-minute paint speed: min. 4 plates per minute</li> <li>• Minimum capacity: 350 plates per hour (length 520mm, width 110 mm of license plates)</li> <li>• Overheating protection, Yes</li> <li>• The operating temperature for standard hot stamping foils min. 170° to 220°C</li> <li>• Temperature adjustable in step of 1°C</li> <li>• Heating up time, &lt; 8 minutes</li> <li>• Power supply ~ 230 V, 50 Hz</li> <li>• Spare parts: <ul style="list-style-type: none"> <li>- rubber roller 1 piece,</li> <li>- Heating lamp 2 piece</li> </ul> </li> <li>• Installation, User and Service manuals in English must be included with the supply</li> </ul> Warranty: 1 year			

**Lot 2: Video surveillance and access control system**

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
2.1.  8	<b>Camera type 1:</b> <ul style="list-style-type: none"> <li>Image sensor: min. 1/2.8" progressive scan CMOS</li> <li>Lens: M12 mount, Fixed iris, Fixed focus 2.8 mm</li> <li>Day and night: Automatically removable infrared-cut filter</li> <li>Minimum illumination: Color: 0.2 lux at 50 IRE, B/W: 0.04 lux at 50 IRE, 0 lux with IR illumination on</li> <li>Video compression: H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles, Motion JPEG</li> <li>Resolutions: min. 1280x1080</li> <li>Multi-view streaming: Up to 2 individually cropped out view areas in full frame rate</li> <li>Security: Password protection, IP address filtering, HTTPSa encryption, IEEE 802.1Xa network access control, Digest authentication, User access log, Centralized Certificate Management</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Notification min.: email, HTTP, HTTPS and TCP and SNMP trap, Video recording to edge storage, Send video clip</li> <li>• Data streaming: Event data</li> <li>• Casing min.: IP66, IK08-rated, polymer casing</li> <li>• Memory: minimum 512 MB RAM, 256 MB Flash</li> <li>• Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 2,</li> <li>• Connectors: RJ45 10BASE-T/100BASE-TX PoE</li> <li>• Storage: Support for microSD/ microSDHC/ microSDXC card</li> <li>• Video management software compatible with camera type 1</li> <li>• Installation, User and Service manuals in English must be included with the supply</li> <li>• Installation and configuration with testing</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
2.2  62	<b>Camera type 2:</b> <ul style="list-style-type: none"> <li>Image sensor: min. 1/3" progressive scan CMOS</li> <li>Lens: M12 mount, Fixed iris, Fixed focus 2.8 mm, F2.0</li> <li>Horizontal field of view: min.80°</li> <li>Vertical field of view: min. 45°</li> <li>Day and night: Automatically removable infrared-cut filter</li> <li>Resolutions: min. 1280x1080</li> <li>Video streaming: Multiple, individually configurable streams in H.264 and Motion JPEG</li> <li>Security min.: Password protection, IP address filtering, HTTPS encryption, IEEE 802.1Xa network access control, Digest authentication, User access log, Centralized Certificate Management</li> <li>Analytics: Included Video Motion Detection, active tampering alarm</li> <li>Notification: email, HTTP, HTTPS and TCP and SNMP trap, Video recording to edge storage, Send video clip</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Memory: minimum 512 MB RAM, 256 MB Flash</li> <li>• Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 2</li> <li>• Connectors: RJ45 10BASE-T/100BASE-TX PoE</li> <li>• Storage: Support for microSD/ microSDHC/ microSDXC card</li> <li>• Video management software compatible with camera type 2</li> <li>• Installation, User and Service manuals in English must be included with the supply</li> <li>• Installation and configuration with testing</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			
2.3 3	<b>Server:</b> <ul style="list-style-type: none"> <li>• Form factor: 19" rack with rack mounting kit max. 2U</li> <li>• Power supply: 2 hot-plug redundant power supplies (min. 800W each)</li> <li>• Fans: min. 3x2 Redundant, hot plug</li> <li>• Processor: At least 2 installed, 8 core each, Passmark CPU Mark for each processor 10700 or higher</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Memory min: 8 GB, DDR4 2,666 MHz / upgradeable on at least 3TB – total of 24 RAM slots</li> <li>ECC Memory protection</li> <li>6 x HD SATA 6G 10TB 7.2K 512e HOT PL 3.5' BC installed</li> <li>2x SAS 12G 300GB 15K 512e HOT PL 3.5' BC installed</li> <li>LAN controller: min. 4x1 Gbit/s Ethernet (RJ45)</li> <li>FC: Fiber Chanel HBA - 1 x Dual Port 16 Gbps</li> <li>RAID Controller 12Gb/s installed with Support RAID levels 0, 1, 5, 6, 10, 50 and 60</li> <li>Interfaces: min. 4 x USB 3.0, 2x VGA, 1x 1GbE LAN port for management</li> <li>Rack mount kit</li> <li>Optical drive min. 8 x DVD</li> <li>Supported OS: VMWare v Sphere, Microsoft Hyper-V, Microsoft Windows Server, Red Hat® Enterprise Linux, SUSE® Linux Enterprise Server or equivalent</li> <li>Installation and configuration (all accessories should be included in offer)</li> <li>Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
2.4  2	<b>Software for monitoring Video surveillance (Ready of the shelf):</b> <ul style="list-style-type: none"> <li>• Multi server support</li> <li>• Support for minimum 300 cameras per recording server.</li> <li>• Unrestricted number of recording servers per system.</li> <li>• Unrestricted number of users</li> <li>• Dual authorization.</li> <li>• Client software free of charge</li> <li>• Map function</li> <li>• Support for third party application integration.</li> <li>• Built in Video Motion Detection.</li> <li>• Support for min. H.265, H.264, MJPEG.</li> <li>• Support for Microsoft Active Directory</li> <li>• Event rule engine</li> <li>• Software must be fully compatible with items 2.1, 2.2 and 2.3.</li> <li>• Software licenses for 70 cameras (items 2.1 and 2.2), compatible for basic software release</li> <li>• Installation and configuration with testing</li> <li>• Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
2.5  7	<b>Mini desktop PC with Display:</b> <ul style="list-style-type: none"> <li>• Monitor: min 23,6", Display Aspect ratio 16:9, FHD, min. IPS, White LED backlight, Min. 250 cd/m2, Display resolution: min 1920x1080, Display Connectivity: min. 1x video input that will be used to connect to offered PC (if needed, appropriate cable must be included)</li> <li>• CPU: Passmark CPU Mark 7000 or higher (min 4 cores, 6MB cache)</li> <li>• Graphic card: Passmark G3D 1100 or higher</li> <li>• RAM: min. 4 GB DDR4, 2400 SDRAM</li> <li>• Connecting: Gigabit Ethernet or 10/100/1000 Ethernet</li> <li>• HDD: min 1 x 256 GB SSD</li> <li>• Optical storage min.: DVD-Writer</li> <li>• Ports: Min. 5 x USB 2.0, VGA, Audio in/out , Ethernet (RJ-45)</li> <li>• Audio: internal speaker</li> <li>• USB Mouse and Keyboard (B&amp;H)</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Operating System: Must fully support the offered solution and software under item 2.4 and 2.11, 64 bit</li> <li>Warranty: 1 year</li> </ul>			
2.6  4	<b>Switch:</b> <ul style="list-style-type: none"> <li>Capacity in Millions of Packets per Second (mpps) (64-byte packets): Min. 9.00</li> <li>Switching Capacity in Gigabits per Second (Gbps): min 12.0</li> <li>RJ-45 Ports: 24 Fast Ethernet</li> <li>Number of Ports That Support PoE: 24</li> <li>Total System Ports: 24 Fast Ethernet + 4 Gigabit Ethernet</li> <li>Min. 2 Gigabit Ethernet combo + 2 SFP</li> <li>Layer 2 Switching min. Spanning Tree Protocol, Port grouping, VLAN, Voice VLAN, Voice VLAN, Q-in-Q VLAN,</li> <li>Layer 3 min. IPv4 routing, IPv6 routing, Classless Interdomain Routing (CIDR), Layer 3 Interface, DHCP relay at Layer 3, User Datagram Protocol (UDP) relay, DHCP</li> <li>IPv6</li> <li>Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
2.7  1	<b>Rack locker:</b> <ul style="list-style-type: none"> <li>• Heights min: 42 U</li> <li>• Widths min: 800 mm</li> <li>• Depths min: 1000 mm</li> <li>• Min load: 400 kg</li> <li>• Degree of protection min: IP 30</li> <li>• Half cylinder lock: Yes</li> <li>• Doors hinge: Right or left</li> <li>• Side and rear panels: Removable and lockable</li> <li>• Accessories min.: bases, fan-units, cable entry panels, fixed shelves, patch panels, cable management, PDUs, doors</li> <li>• Warranty: 1 year</li> </ul>			
2.8  11	<b>Access Controller:</b> <ul style="list-style-type: none"> <li>• Controller allows access min. for up to 30000 users and saves 100000 events</li> <li>• Readers min: 8 x protocol (RS485)</li> <li>• Inputs min. 4 x door status and 4 x button</li> <li>• Outputs min: 4 x output - max. 0.5 A on each output</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Relays min: 4 x 5A, 60V</li> <li>Input voltage min: 110 – 230 V AC 50–60 Hz</li> <li>Output voltage min. 13.8 V DC</li> <li>Humidity min. 80 %, non-condensing</li> <li>Operating temperature min. From -20°C to 40°C</li> <li>Compatible with items. 2.9, 2.10 and 2.11</li> <li>Communication: RS485 or Ethernet</li> <li>Communication protocol: min. V9 Protocol supported</li> <li>Clock: Real time clock, battery backup (min. 9 hours)</li> <li>Warranty: 1 year</li> </ul>			
2.9  56	<p><b>Reader:</b></p> <ul style="list-style-type: none"> <li>Reader reading frequency: 125kHz</li> <li>Reader reading distance up to 13cm.</li> <li>Protection min: IP55</li> <li>Compatible with items. 2.8, 2.10 and 2.11</li> <li>Communication: min. RS485</li> <li>Operating voltage min: From 9 V to 14 V DC</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Operating temperature min. From -20°C to 60°C</li> <li>Cable min. 10 cm</li> <li>LED diodes Flashing red/green: Normal mode</li> <li>Lit green: Electric strike is unlocked</li> <li>Lit red: Card has no rights</li> <li>Warranty: 1 year</li> </ul>			
2.10 24	<b>Capacitive touch button:</b> <ul style="list-style-type: none"> <li>Capacitive touch min. 0 – 2 (mm)</li> <li>Compatible with items. 2.8, 2.9 and 2.11</li> <li>Operating voltage min. From 9V to 14V DC</li> <li>Operating temperature min. From -20°C to 55°C</li> <li>Protection min: IP65</li> <li>Flat cable min. 10cm</li> <li>Warranty: 1 year</li> </ul>			
2.11 2	<b>Software for access control system (Ready of the shelf) :</b> <ul style="list-style-type: none"> <li>Web-based access control software</li> <li>Functionality with any number of readers or users</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Software features and services have to include min.</b></p> <ul style="list-style-type: none"> <li>• IP-camera image capture</li> <li>• Fingerprint reading for verification or identification</li> <li>• Monitoring users and visitors on layouts</li> <li>• Exporting of data to text files</li> <li>• Programming of macro orders for advanced users</li> <li>• The monitor function have to displays events in real time and the picture of the user who triggered the event</li> <li>• Controls multiple lines of communication</li> <li>• Unlimited number of users.</li> <li>• Unlimited number of locations</li> <li>• Include supports for multiple access controllers</li> <li>• Multiple timetables</li> <li>• Multiple groups of users.</li> <li>• Multiple administrators</li> <li>• The possibility of limiting the rights of administrators</li> <li>• Administration operations should be recorded and must have possibility to be reported</li> <li>• Multiple cards/pins can be issued to each user</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Live events monitor.</li> <li>• Users' names can be imported from .csv or Excel files</li> <li>• Events history</li> <li>• Past events reports and filtering</li> <li>• Multiple reports, e.g. access rights and system activity.</li> <li>• Included into supply: delivery, testing and deployment of software specified under item 2.11. On hardware specified in items 2.8, 2.9 and 2.10.</li> <li>• Warranty: 1 year</li> </ul>			
2.12 1	Installation, customization with testing functionality for items from 2.1 to 2.11			
2.13 1	<ul style="list-style-type: none"> <li>• Putting the system (all items from 2.1 to 2.11) into operation and training of 5 (five) IDDEEA users (min. duration of training 2 days, min 4 hour per day)</li> </ul> <p>General requirements related to the trainings are:</p> <ul style="list-style-type: none"> <li>• Training plan should cover all equipment which is part of LOT 2 of this specification</li> <li>• The training provider's instructors should have a substantial and proven experience in their respective fields.</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• All trainings must be conducted in one of the BiH official languages.</li> <li>• All training materials must be in one of the BiH official languages.</li> <li>• Trainings will take place at the beneficiary location as stipulated in the table under section 4 of Preamble of the Technical Specifications for this lot.</li> </ul>			

### Lot 3: Notebooks, Desktops computers and printers

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
3.1  30	<b>Notebook Type 1:</b> <ul style="list-style-type: none"> <li>• Display: min 12,5"- max 14", Full HD, Anti-glare, minimum 220 cd/ m<sup>2</sup></li> <li>• CPU: 4 cores, 8 threads, 8 MB cache, PassMark points min. 8800</li> <li>• Graphic card: Passmark G3D 1100 or higher</li> <li>• RAM: min. 16GB DDR4, 2400 MHz</li> <li>• Connecting: min. Gigabit Ethernet or 10/100/1000 Ethernet, WLAN Dual Band, Bluetooth 4.1</li> <li>• Camera: min. HD 720p webcam</li> <li>• HDD: min. 1x 512GB SSD</li> <li>• Interface: 3 x USB 3.1 (min. 1x USB Type C/Thunderbolt and one always-on or PowerShare), HDMI</li> <li>• Audio: 2 x speakers, stereo</li> <li>• Docking: Single connector, single cable, full docking functionality: audio, video, USB, networking and charging.</li> <li>• Battery: min 3-cell battery, 48 WH, support for fast charging</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Security: Fingerprint reader, vPro, Smart Card Reader; Power-on password, HDD password, supervisor password, TPM 2.0 - or security features with the same or better functionality</li> <li>Keyboard: Localized BiH language</li> <li>Mouse: Optical, scroll, USB</li> <li>Weight up to 1.5Kg</li> <li>Operating System: Preinstalled operating system, 64 bit</li> <li>Other: carrying case for offered notebook, premium/professional class</li> <li>EXTERNAL HDD min. 1 TB</li> <li>Warranty: 1 year with official Service support.</li> <li>Commercial warranty as granted by the manufacturer.</li> </ul>			
3.2  35	<b>Notebook Type 2:</b> <ul style="list-style-type: none"> <li>Display: min. 15.6", Full HD, Anti-glare</li> <li>CPU: 4 cores, 8 threads, 6 MB cache, PassMark points min. 7600</li> <li>Graphic card: Passmark G3D 1100 or higher</li> <li>RAM: min 8 GB DDR4, 2400 MHz, upgradable up to 32GB</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Connecting min. Gigabit Ethernet or 10/100/1000 Ethernet, WLAN Dual Band, Bluetooth 4.1</li> <li>Camera: min. HD 720p webcam</li> <li>HDD: min. 1x 256 GB SSD</li> <li>Interface: min Micro SD Card reader, USB 3.1 Gen 1 (with Always-On/Power Share), 1x USB 3.1 Type-C, 1x USB 2.0, HDMI 1.4, Ethernet (RJ-45), headphone / microphone combo jack, security keyhole or wedge lock slot</li> <li>Audio: 2 x speakers, stereo</li> <li>Battery: min. 45 WH, support for fast charging</li> <li>Security and certificates min. Fingerprint reader, Power-on password, HDD password, supervisor password, TPM 2.0, ENERGY STAR 6.1, RoHS-compliant</li> <li>Mouse: Optical, scroll, USB</li> <li>Keyboard: Localized BiH language</li> <li>Weight: up to 2.3KG</li> <li>Operating System: Preinstalled operating system, 64 bit,</li> <li>Other: carrying case for offered notebook, essential class</li> <li>External HDD min. 1 TB</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Warranty: 1 year with official Service support.</li> <li>Commercial warranty as granted by the manufacturer</li> </ul>			
3.3  82	<b>PC Type 1 – Workstation:</b> <ul style="list-style-type: none"> <li>CASE: min. power supply 180W, autosensing, 85% PSU</li> <li>Monitor: min. 23", 16:09, FHD, min. IPS, White LED backlight. 250 cd/m2, Display resolution: min 1920x1080, Display Connectivity: min. 1x video input that will be used to connect to offered PC (if needed, appropriate cable must be included)</li> <li>CPU min. 6 cores, 12 threads, 12 MB cache, PassMark points min. 15100</li> <li>Graphic card: Passmark G3D 1100 or higher</li> <li>RAM: min. 16 GB DDR4, 2666 MHz, upgradable to min. 64 GB</li> <li>Connecting: Gigabit Ethernet or 10/100/1000 Ethernet</li> <li>HDD: min. 1x 512 GB SSD</li> <li>Bays: min. 1x 2.5", 1 x 3,5", 1 x 5.25"</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Slots min. 1x PCIe 3.0 x 16, 1 x PCIe 3.0 x16 (x4), PCIe 3.0 x 1, 2x M.2 card</li> <li>• Interface min. Mini 6 x USB 3.1, mini 1x USB 3.1 Type-C Gen1, 1 x HDMI/VGA, 2 x DP, line-in, line-out, microphone</li> <li>• DVD RW, Audio: internal speaker</li> <li>• Mouse: Optical, scroll, USB, Keyboard: Localized BiH</li> <li>• Security min. Power-on password, Administrator password, Hard disk password, TPM 2.0 or security features with the same or better functionality</li> <li>• Operating System: Preinstalled operating system, 64 bit,</li> <li>• External HDD: min. 1 TB</li> <li>• Warranty: 1 year with official Service support.</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
3.4  80	<b>PC Type 2 – Workstation:</b> <ul style="list-style-type: none"> <li>• CASE: with min. power supply 180W; autosensing, 85% PSU</li> <li>• Monitor: min 21,5”, 16:09, FHD, min. IPS, White LED backlight. 250 cd/m2, Display resolution: min 1920x1080, Display Connectivity: min. 1x video input that will be used to connect to offered PC (if needed, appropriate cable must be included)</li> <li>• CPU min. 6 cores, 6 threads, 9 MB cache, PassMark points min. 11900</li> <li>• Graphic card: Passmark G3D 1100 or higher</li> <li>• RAM: min. 4 GB DDR4, 2666 MHz</li> <li>• Connecting min. Gigabit Ethernet or 10/100/1000 Ethernet, WakeOn Lan</li> <li>• HDD: min. 1TB 7200rpm SATA</li> <li>• Slots min: 1x PCIe 3.0 x16, 2x PCIe 3.0 x1, M.2 card slots: two (2) (one for WLAN, one for SSD/Optane)</li> <li>• Interface min. 8 x USB (min. 4 (four) front), HDMI/VGA, DP, microphone/headset combo jack, 2x M.2 Card slots (one for WLAN, one for SSD/Optane), ethernet (RJ-45)</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>DVD RW, Audio: internal speaker</li> <li>Mouse: Optical, scroll, USB, Keyboard: Localized BiH,</li> <li>Security min. Power-on password, Administrator password, Hard disk password, TPM 2.0 or security features with the same or better functionality</li> <li>Operating System: Preinstalled operating system, 64 bit</li> <li>External HDD: min. 1 TB</li> <li>Warranty: 1 year with official Service support.</li> <li>Commercial warranty as granted by the manufacturer.</li> </ul>			
3.5  30	<b>Printer Type 1:</b> <ul style="list-style-type: none"> <li>Printer Black/White</li> <li>Print speeds min. 40 ppm</li> <li>Processor min. 800 MHz</li> <li>Memory min. 256 MB</li> <li>Resolution min. 1200 x 1200 dpi</li> <li>Standard Connectivity Gigabit Ethernet, USB 2.0 Hi-Speed</li> <li>Automatic two-sided printing Standard</li> <li>Paper input min. 250 sheets</li> <li>Paper Output min. 150 pages</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Multipurpose Feeder/Bypass Tray min. 50 sheets</li> <li>• Duty Cycle min. 80.000 pages per month</li> <li>• Warranty: 1 year</li> </ul>			
3.6  10	<b>Printer Type 2 :</b> <ul style="list-style-type: none"> <li>• Printer Color</li> <li>• Print speeds min. 53 ppm</li> <li>• Processor min. 1.05 GHz</li> <li>• Memory min. 1GB, up to 2 GB</li> <li>• Resolution min. 1200 x 1200 dpi</li> <li>• Standard Connectivity Gigabit Ethernet, USB 2.0 Hi-Speed</li> <li>• Automatic two-sided printing Standard</li> <li>• Paper input min. 550 sheets</li> <li>• Paper Output min. 500 pages</li> <li>• Multipurpose Feeder/Bypass Tray min. 100-sheets</li> <li>• Touch control panel min. 4.3", colour touchscreen</li> <li>• Duty Cycle min. 120.000 pages, Monthly Page</li> <li>• Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
3.7  5	<b>All in One Display/SmartBoard:</b> <ul style="list-style-type: none"> <li>• Storage All in one (DISPLAY + PC)</li> <li>• Display Size min. 65" (165cm)</li> <li>• OS: 64 bit, Customisable Graphical User Interface(GUD),</li> <li>• Display Resolution min. full HD</li> <li>• Response time max. 8 ms</li> <li>• View angle min. 178/178</li> <li>• Screen type LED</li> <li>• Contrast min 300 cd/m2 1200:1</li> <li>• Frequency min. 60MHz</li> <li>• Interface min. VGA, HDMI, USB</li> <li>• CPU min. 6 cores, 6 threads, 9 MB smart cache, PassMark points min. 11550</li> <li>• Memory type min. 4 Gb DDR</li> <li>• Internal Memory min. 128 GB</li> <li>• Touch YES</li> <li>• Touch point min. 10</li> <li>• AC 100-240V</li> <li>• Speaker integrated 2x10W</li> <li>• WI-FI, yes</li> <li>• Stands Mobile or wall mounting (Wall mounting Adapter Bracket included)</li> <li>• Warranty: 1 year</li> </ul>			

#### Lot 4: Network Equipment

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
4.1.  2	<b>Firewall type I</b> <ul style="list-style-type: none"> <li>Nominal Voltage: AC 240 V</li> <li>Frequency Required: 50-60 Hz</li> <li>Power Redundancy : yes</li> <li>Operating Temperature: 0-40 °C</li> <li>Humidity range min. 10% to 90%</li> <li>Min. 240 GB SSD storage</li> <li>Features: High Availability, IPv4 support, IPv6 support, Intrusion Prevention System (IPS), VPN support, antivirus analysis, content filtering, firewall protection</li> <li>Interfaces min: 1 x USB, 16 x GE RJ45 ports, 4 x 10 GbE SFP+slots, 1 x USB Management Port</li> <li>Concurrent sessions min. 11 Mil.</li> <li>Firewall Throughput min. 72 Gbps</li> <li>Min. 6 Gbps of NGFW Throughput</li> <li>Min. 4 Gbps of Threat Prevention</li> <li>Min. 6.8 Gbps of IPS</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• High Availability Configurations: Active-Active, Active-Passive, Clustering</li> <li>• Delivery all necessary equipment to ensure all requested functionality (min. transceiver for 10G SFP+ ports, licences)</li> <li>• Working in HA mode</li> <li>• Delivery and mounting of equipment in racks</li> <li>• 1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.2  2	<b>Firewall type II</b> <ul style="list-style-type: none"> <li>• Nominal Voltage: AC 240 V</li> <li>• Frequency Required: 50-60 Hz</li> <li>• Power Redundancy : yes</li> <li>• Operating Temperature: 0-40°C</li> <li>• Humidity range min. 10% to 90%</li> <li>• Min. 2 x 240 GB SSD storage</li> <li>• Features min. High Availability, IPv4 support, IPv6 support, Intrusion Prevention System (IPS), VPN pass through, VPN support, antivirus analysis, content filtering, firewall protection</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Interfaces min. 1 x USB, 8 x GE RJ45 ports, 8 x GE SFP slots, 2 x 10 GbE</li> <li>• Concurrent sessions min. 8 Mil.</li> <li>• Firewall Throughput 36 Gbps</li> <li>• 5 Gbps of NGFW Throughput</li> <li>• Min. 4,195 Gbps of Threat Prevention</li> <li>• 5.2 Gbps of IPS</li> <li>• High Availability Configurations: Active-Active, Active-Passive, Clustering</li> <li>• Delivery all necessary equipment to ensure all requested functionality (transceiver for 10G SFP+ ports, licences etc.)</li> <li>• Working in HA mode</li> <li>• Delivery and mounting of equipment in racks</li> <li>• 1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.3	<b>Switch type I</b>			
2	<ul style="list-style-type: none"> <li>• Nominal Voltage: AC 240 V</li> <li>• Frequency Required: 50-60 Hz</li> <li>• Humidity min. range 10% to 90%</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Ports min. 24 x 10 GE SFP + ports (delivery transceiver for all 10 G SFP+ports and 24 fiber optic cable – 12 x length 3m and 12 x length 5m)</li> <li>Switching Capacity min. 480 Gbps</li> <li>Link Aggregation supported: yes</li> <li>VLANs supported: yes</li> <li>Layer 3: supported</li> <li>Supported High Availability</li> <li>Delivery and mounting of equipment in racks</li> <li>1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.4  2	<b>Switch type II</b> <ul style="list-style-type: none"> <li>Nominal Voltage: AC 240V</li> <li>Frequency Required: 50-60 Hz</li> <li>Ports min. 48 x 10/100/1000 RJ45 and 2 x 10 GE SFP+ ports (delivery transceiver for all 10 GE SFP+ports)</li> <li>Switching Capacity: 96 Gbps ( duplex 176 Gbps)</li> <li>Manageable: yes</li> <li>Delivery and mounting of equipment in racks</li> <li></li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.5  4	<b>Switch type III</b> <ul style="list-style-type: none"> <li>Nominal Voltage: AC 240 V</li> <li>Frequency Required: 50-60 Hz</li> <li>Ports min. 20 x 10 G BASE-T and 4 x 10 GE SFP+ ports (delivery transceiver for all 10 GE SFP+ports)</li> <li>Switching Capacity min. 560 Gbps</li> <li>Manageable: yes</li> <li>Layer2+/Layer 3 Lite supported</li> <li>Delivery and mounting of equipment in racks</li> <li>1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.6  3	<b>Radio links</b> <ul style="list-style-type: none"> <li>Delivery and installation of two links IDDEEA Banja Luka - Starčevica and IDDEEA Banjaluka-Šibovi)</li> <li>The planned configuration of the RR device will be: 1 + 1, 4 + 0 or 2 + 2</li> <li>Devices must be capable of working in protective HSB configurations.</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Multichannel N + 0 radio configurations must be available, with upgrades up to a min. of 4 + 0, where channel aggregation is performed at physical (L1) level, for nodal solutions.</li> <li>• RR devices must support the following modulation: QPSK / 4QAM, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM, 1024QAM and 2048QAM for 27.5MHz frequency band width. All required modulation procedures must be available in a fixed and adaptive mode of operation.</li> <li>• RR devices must provide a minimum of 180 Mbps for the 256QAM in the 27.5MHz radio channel, with the possibility of upgrading up to 250 Mbps radio stream for 2048 QAM modulation in a 27.5MHz radio channel. The capacity license must include the maximum radio per channel (250 Mbps).</li> <li>• RR units will be realized in split mount configuration with internal and external units.</li> <li>• The internal unit must have the following interfaces (for nodal solutions): Min. 8 x GbE /FE 10/100 / 1000Base-T Traffic Ethernet Interfaces</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>(RJ-45), with the option of alternating 8 x GbE 1000Base-X Optical Interface.</p> <ul style="list-style-type: none"> <li>• 2 x RJ45 FE port and serial port for access control and management</li> <li>• The radio interface has an external unit - the coaxial cable connector.</li> <li>• Two independent power connectors, which are part of the redundant power supply system.</li> <li>• Indoor units must be fully equipped to accommodate 19 "/ ETSI rack. Indoor units must be delivered with the appropriate mounting kit in the 19 "/ ETSI rack.</li> <li>• The indoor unit must be designed for correct operation in a temperature range of -5 ° C to + 55 ° C and an outdoor unit in the range of -33 ° C to + 55 ° C.</li> <li>• Outdoor units must be designed for separate installation. The outdoor unit must have an earth terminal.</li> <li>• Devices must support advanced techniques of non-multiplication (compression) of headings L2 to L4, in order to increase overall traffic flow, without affecting proper transmission of traffic.</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• An upgrading of up to 8 radio units per channel, as part of multi-channel and / or shielded (HSB) links, or as multiple radio lines, must be available.</li> <li>• Devices must have full hardware and software protection (redundancy), for nodal solutions:</li> <li>• Control section</li> <li>• Ethernet traffic and interfaces</li> <li>• Torque components and connectors</li> <li>• The 802.3ad LAG must be supported. It must be possible for any 4 GbE port to be assigned to the LAG.</li> <li>• Devices will work in the 18 GHz frequency band, 18195-18662.5 / 19205-19672.5 MHz</li> <li>• The transceiver will be placed in a watertight housing.</li> <li>• The min. transmit power at the 18 GHz outdoor unit antenna, at 128QAM modulation, must be <math>\geq 17\text{dBm}</math>.</li> <li>• Transmission frequency deviation must be <math>\leq \pm 10\text{ppm}</math>.</li> <li>• Bit error level in the reception threshold function (<math>\text{BER} \leq 10^{-6}</math>) for all channel widths and modulation levels.</li> <li>• The external unit will have a measurement checkpoint for measuring</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>the input signal level in the receiver (RSSI).</p> <ul style="list-style-type: none"> <li>• The device should have the Automatic Transmit Power Control (ATPC) function enabled. In the event of a failure on the ATPC system, the device will automatically and faultlessly switch over to the mode of manually defined transmitter power.</li> <li>• The indoor and outdoor units should be connected to IF coaxial cables with a characteristic impedance of 50 Ω. The same cable will be transmitted:</li> <li>• Control signals,</li> <li>• Receiving and Sending Signals</li> <li>• Power supply for the outdoor unit.</li> <li>• The electrical characteristics of the offered coaxial or symmetrical cable shall be such as to allow a min. distance between the indoor and outdoor units up to 300 m at the supply voltage of -48V.</li> <li>• Min. 1 grounding set for each coaxial cable of one RR station must be provided.</li> <li>• For each RR hop, the appropriate length of the coaxial cable must be provided.</li> <li>• Predict the metal or plastic braces. Mounting brackets will be provided for</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>outdoor assembly and will be weather resistant.</p> <ul style="list-style-type: none"> <li>• The nominal supply of each IDU must be -48V (-41 to -60 VDC or higher range).</li> <li>• Devices will support Quality Service Management (QoS) through Classification of Traffic in 8 Service Classes (assigned to queues) with minimum 4 priority levels of serving queues. Strict priority between the different priority levels will be performed, while the Weighted Fair Queuing (WFQ) principle of service.</li> <li>• Predefined value per port or Ethernet service</li> <li>• The definition of QoS will be realized through software.</li> <li>• Devices must support as an option the advanced quality service techniques in which the classification of traffic in queues besides the categories of traffic-based traffic (voice, data, real time streaming etc.) can also be realized by the services that transmit it.</li> <li>• The electrical Ethernet interface 10/100 / 1000Base-T will be the following features:Connector type: RJ45, Electrical</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>interface: according to IEEE 802.3 standard, Each electrical port will support the following regimens: 10Mbps HD, 10Mbps FD, 100Mbps HD, 100Mbps FD, and 1000Mbps FD,</p> <ul style="list-style-type: none"> <li>• Each electrical port will support Auto-Negotiation 10/100 / 1000Base-T, half / full duplex,</li> <li>• Optical GbE interface will be the following features: 1000BaseLX for single-mode fiber optic.</li> <li>• Devices must have enabled monitoring and management over HTTP protocols via standard WEB browser.</li> <li>• Devices must support monitoring and management via SNMP protocols. SNMPv1 and v2 must be mandatory when SNMv3 needs to be least accessible as a future extension.</li> <li>• Each device must have at least 2 (two) FE Ethernet interfaces for local access to the terminal.</li> <li>• It is necessary to integrate the offered RR equipment into an already existing network monitoring and management system owned by the Agency,</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Net Master Client.</b></p> <p>RR devices must have the option of subsequent enabling of the following synchronization methods:</p> <ul style="list-style-type: none"> <li>• “Synchronous Ethernet” by ITU-T Rec. G.8261 i G.8262.</li> <li>• IEEE 1588v2 “Precision Time Protocol (PTP)”. TC (Transparent clock), it must be supported.</li> <li>• External T3 Synchronization Input (2048 KHz)</li> <li>• The bandwidth distribution over the radio frame should be supported.</li> <li>• Provide all the necessary equipment with the links to have the complete functionality required (min. rectifier modules, power supply, card required, antennas)</li> </ul> <p>Installation and mounting of equipment should be included in supply at next IDDEEA location:</p> <ul style="list-style-type: none"> <li>• Link IDDEEA Banjaluka - Sibovi to be realized in 4 + 0 or 2 + 2 technology and IDDEEA Banja Luka - Starcevica in 1 +</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>1 mode.</p> <ul style="list-style-type: none"> <li>At the central location (IDDEEA Banja Luka realizes a nodal solution and at the locations Sibovi and Starcevic individual solutions).</li> <li>Provide backup power (batteries) at Starcevic and Sibovi location, GEL technology, autonomy 12h at output power 500 W, possibility to place in a 19 "rack cabinet. Starčevica 120 Ah (block 12V), Šibovi 2 x 120 Ah (block 48 V)</li> <li>1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			
4.7  2	<p><b>DDoS Appliance</b></p> <ul style="list-style-type: none"> <li>Analyze non filter traffic (inbound)</li> <li>Attack Protections min. DNS, HTTP, multi vector attack</li> <li>Throughput min. (Enterprise Mix – Gbps): 2 Gbps</li> <li>Packet Throughput min. (Mpps): 4</li> <li>Protection Ports: Min 4 x 10/100/1000 Copper Ethernet, Min 2 x 1GbE Fiber</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>DDoS Attack Mitigation Response Time (s) : &lt;2</li> <li>DNS Queries per second (M) : 1</li> <li>Storage capacity min. 240 GB SSD</li> <li>Delivery and mounting of equipment in racks</li> <li>1 Year technical support and hardware replacement</li> </ul>			
4.8  30	<b>VoIP phone</b> <ul style="list-style-type: none"> <li>Sip features</li> <li>Codecs min. G7.29A/B, G.711μ/a-law, G.726, G.722(wide-band)</li> <li>Protocols/standards min. NTP / TFTP / HTTP / HTTPS / TCP/IP / UDP / ARP / DHCP / TELNET / IPV6</li> <li>Min. Two ports Ethernet switch, RJ45, 10/100/1000 Mbps</li> <li>Power over Ethernet (PoE)</li> <li>Call transfer, hold, forward, park, pickup</li> <li>Min three-way audio conferencing</li> <li>Downloadable phonebook (XML, LDAP, supporting min. 1500 items)</li> <li>Auto dial, Auto answer</li> <li>Call waiting</li> <li>Transport Layer Security (TLS)</li> <li>Call log (min. 500 records)</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Compatible with Bicom PBXWARE</li> <li>• Min. 5 programmable keys</li> <li>• Min. 5 navigation/menu keys</li> <li>• Built-in Bluetooth compatibility for Headset</li> <li>• Firmware upgrade via TFTP / HTTP / HTTPS</li> <li>• Multilanguage</li> <li>• Min. 6 line keys with up to 6 SIP accounts</li> <li>• Min. 4.0 inch (480x272) TFT color LCD</li> <li>• 1 Year warranty and technical support including hardware replacement, ( 8 x 5 or 24*7)</li> </ul>			

### Lot 5: Big data Appliance, Servers and other Equipment

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
5.1  1	<p><b>Big Data Appliance</b></p> <ul style="list-style-type: none"> <li>• Integrated system with server, storage and networking infrastructure</li> <li>• 42U rack with all the internal network cabling between components</li> <li>• Connectivity to external NFS or IP storage systems</li> <li>• Support for min. 6 nodes and support linear scalability of min. 16. servers</li> <li>• The proposed solution may support different configurations of Server/Storage Nodes models capacity</li> </ul> <p><b>Node Servers specifications</b></p> <ul style="list-style-type: none"> <li>• Min. 6 physical servers per rack upgradeable to min. 16 Servers per rack</li> <li>• Minimum 2 (two) x86 CPUs with minimum score of 21500 points on Passmark benchmark</li> <li>• Memory min. 256 GB (type:DDR4-2666 and up) upgradeable to 3TB</li> <li>• Storage: min. 100TB on high capacity SAS HDDs</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• OS storage. 2 x M.2 SATA SSD Drives min. 128 GB capacity for OS</li> <li>• Has the following network options: Min. 2 x 25 Gbps Ethernet or 40 Gb Infiniband connectivity</li> <li>• Integrated dedicated 1GbE management port</li> <li>• Redundant and hot swappable power supplies</li> <li>• Minimum 2 (two) high speed network switches with minimum 32 x 25/40Gb Ethernet ports or 32 x 40 Gb ports for cluster interconnection between nodes</li> <li>• Management and configuration software that can handle and monitor all hardware and software resources</li> <li>• Operating Systems installed: 64 bit</li> <li>• Support for min. : Cloudera Enterprise, Cloudera's Distribution including Apache Hadoop , Cloudera Impala, Cloudera Search, Apache HBase, Apache Spark, Apache Kafka and Cloudera Manger</li> <li>• Hardware Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> <li>• Software support 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
5.2  3	<b>Open Stack, Server Type 1: Controller node</b> <ul style="list-style-type: none"> <li>• 1U server with equipment for mounting in rack 19"</li> <li>• Motherboard with: min. 6 slots DDR4 memory, 2 x 10Gb/s Rj45 Ethernet or 2 x 10 Gb/s SPF+ Ethernet, min. 3 x PCIe 3.0 for additional cards, IPMI support via dedicated port</li> <li>• Min. 4 Hot-Swap 3.5" SATA3 drive bay or better</li> <li>• CPUs with minimum score of 22600 points on Passmark benchmark, 16 cores min. 22 MB Cache (125W)</li> <li>• Min. 6 x 8GB PC4-21300 2666MHz DDR4 memory or better</li> <li>• 2 x 300GB SAS 6.0 Gb/s for Dedicated Boot OS</li> <li>• SAS 3.0 12Gb/s 8-port RAID Controller with 2GB Cache –with supported RAID 0,1,5,6,10 or better</li> <li>• Cache Vault (battery) Module for RAID Controller</li> <li>• 4 x 1.2TB SAS 3.0 12 Gb/s 10000RPM 2.5" or 3.5" Enterprise Class Hard Drives or better</li> <li>• Min. 2 x 960GB SATA 6.0 Gb/s 2.5" SSD Disks</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• 10-Gigabit Ethernet Adapter with 2 SPF+ Ports or better</li> <li>• Possible mount external CD/DVD drive</li> <li>• Modular double power supply for 220 V AC with corresponding cables min 2,8m</li> <li>• Supporting OS: SUSE OpenStack Cloud Control Node + SUSE OpenStack Cloud Administration Server (including entitlements for High Availability and SUSE Linux Enterprise Server 12 SP2) or equivalent</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> <li>• One year support</li> </ul>			
5.3 3	<b>Open Stack, Server Type 2: Compute node</b> <ul style="list-style-type: none"> <li>• 1U server with equipment for mounting in 19" Rack</li> <li>• Motherboard with: min. 24 slots DDR4 memory 2666 MHz, 2 x 10Gb/s Rj45 Ethernet or 2 x 10 Gb/s SPF+ Ethernet, min 4 x PCIe 3.0 for additional cards, IPMI support</li> <li>• Min. 8 x Hot-Swap SAS drive bay support via optional Addon Card</li> <li>• Min. 8 x SATA3 (6Gb/s) ports</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Dual UPI up to 10.4 GT/s</li> <li>• CPUs with minimum score of 22600 points on Passmark benchmark, 16 cores min. 22 MB Cache (125W)</li> <li>• Min. 16 x 16GB PC4-21300, 2666MHz DDR4 memory or better</li> <li>• 2 x 300 GB SAS 12 Gb/s for Dedicated Boot OS</li> <li>• Min. 8 x 960GB 2.5" SATA 6.0 Gb/s SSD Disk</li> <li>• SAS 3.0 12Gb/s 8-port RAID Controller with 2GB Cache - with supported RAID 0,1,5,6,10 or better</li> <li>• Cache Vault (battery) Module for RAID Controller</li> <li>• Possible mount external CD/DVD drive</li> <li>• Intel 10-Gigabit Ethernet Adapter with 2 SPF+ Ports or better</li> <li>• Modular double power supply for 220 V AC with corresponding cables min 2.8m</li> <li>• Supporting OS: SUSE OpenStack Cloud Compute Node (including entitlements for High Availability and SUSE Linux Enterprise Server 12 SP2) or equivalent</li> <li>• Warranty: 1 year</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Commercial warranty as granted by the manufacturer</li> <li>One year support</li> </ul>			
5.4  3	<b>Open Stack, Server Type 3: Storage node</b> <ul style="list-style-type: none"> <li>2U server with equipment for mounting in rack 19"</li> <li>Motherboard with: min. 8 slots DDR4 memory, 2 x 10Gb/s Rj45 Ethernet or 2 x 10 Gb/s SPF+ Ethernet, min. 3 x PCIe 3.0 for additional cards, IPMI support via dedicated port</li> <li>Min. 8 x Hot-swap SAS/SATA drive bay</li> <li>Min. 2 Hot-swap NVMe/SATA drive bay</li> <li>CPUs with min. score of 22600 points on Passmark benchmark, 16 cores min. 22 MB Cache (125W)</li> <li>Min. 8 x 8GB PC4-21300 2666MHz DDR4 memory or better</li> <li>2 x 300GB SAS 6.0 Gb/s for Dedicated Boot OS</li> <li>SAS 3.0 12Gb/s 8-port RAID Controller with 2GB Cache – with supported RAID 0,1,5,6,10 or better</li> <li>Cache Vault (battery) Module for RAID Controller</li> <li>6 x 4TB 3.5" SAS 3.0 12 Gb/s 7200RPM 512n disks or better</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• 2 x 960GB 3.5" SATA 6.0Gb/s SSD Disks or better</li> <li>• 10-Gigabit Ethernet Adapter with 2 SPF+ Ports or better</li> <li>• Possible mount external CD/DVD drive</li> <li>• Modular double power supply for 220 V AC with corresponding cables min. 2.8 m</li> <li>• 2 x PCIe3.0 x4 Flash Adapter</li> <li>• Supported OS: SUSE OpenStack Cloud Storage Node, support for Swift and Ceph (including entitlements for High Availability and SUSE Linux Enterprise Server 12 SP2)</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> <li>• One year support</li> </ul>			
5.5  1	<b>Micro Data Center</b> <ul style="list-style-type: none"> <li>• Micro Data Center with max. Dimension: 1150 x1800x2400 mm (WxDxH).</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p>The following elements must be included in the Micro Data Center:</p> <ul style="list-style-type: none"> <li>• 42U cabinet (min. 35U of usable IT space, Power)</li> <li>• Fully assembled in factory with interior cabling installed</li> <li>• Min. 8kVA Smart-UPS with min. 5 minutes runtime at 8000W</li> <li>• Power distribution unit with min. 3 pcs with following specifications: In=16A, Voltage =230V, min. 7xC13 and 1XC19 outlet</li> </ul> <p><b>Smart UPS Includes:</b></p> <ul style="list-style-type: none"> <li>• Rack Mounting brackets, Rack Mounting support rails, Temperature Probe, Web/SNMP Management Card</li> <li>• Min. output power capacity 8000 Watts / 8 kVA</li> <li>• Batteries - battery type maintenance-free sealed</li> <li>• Recharge time max 2 hour(s)</li> <li>• Communications and management Interface Port(s): RJ-45 10/100 Base-T, RJ-45 Serial, Smart-Slot, USB Available SmartSlot</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Doors includes:</b></p> <ul style="list-style-type: none"> <li>• Front and back doors</li> <li>• Mechanical lock with 4 locking points to ensure a tight closing, physical security against vandalism and reduced deformation if the door is exposed to very high temperatures.</li> </ul> <p><b>Cooling includes:</b></p> <ul style="list-style-type: none"> <li>• Precision Cooling, min. 9.0 kW, cooling capacity and INROW system cooling type</li> <li>• Flooded Receiver</li> <li>• Condenser, 2 Fan, Single Circuit, 220/1/50</li> <li>• Includes cabling and circuit breaker protection</li> <li>• Possibility to upgrade to 2N Cooling</li> </ul> <p><b>Support monitoring for :</b></p> <ul style="list-style-type: none"> <li>• Temperature and humidity</li> <li>• Smoke</li> <li>• Video surveillance</li> <li>• Include Central Management System</li> </ul> <p><b>Security and Access Control</b></p> <ul style="list-style-type: none"> <li>• Electronic lock,</li> <li>• Rack access handle on front and rear doors</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Heavy Duty wheels</li> <li>• Anti-vibration heavy duty spring support system</li> <li>• Earth-bonding</li> <li>• Protection against water and dust</li> <li>• Cable gland for data/power, with min. capacity for 45 UTP cables</li> <li>• All included elements in Micro Data Center has to be factory preinstalled and tested from the manufacturer</li> <li>• Installation: Full installation and configuration with testing</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			
5.6 5	<p><b>GPS NTP Server</b></p> <ul style="list-style-type: none"> <li>• GNSS Receiver or equivalent receiver for convert signals from visible satellites into position on earth.</li> <li>• Antenna: Outdoor Antenna, Environmental IP67, Lightning Arrestors ,Cable length min. 50m</li> <li>• Network Protocols min. SNMP, SSH, Telnet, DHCP, IPv4, IPv6, 802.1q</li> <li>• Time Accuracy: max. +/-50 ns RMS to UTC at 1PPS output</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• 1 Day Holdover Accuracy: Rubidium Oscillator &lt; 5 <math>\mu</math>s</li> <li>• NTP Server Performance: min. 7500 NTP requests per second</li> <li>• Network: min. 2 RJ-45 100/1000 Base-T Ethernet</li> <li>• 1PPS-Out: BNC</li> <li>• GNSS: BNC L1</li> <li>• Console min: DB9-F RS-232</li> <li>• Size: max. 1U rack mount</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			
5.7 2	<p><b>NAS Storage</b></p> <ul style="list-style-type: none"> <li>• Hard disk bays: min. 9 x 3.5" or 2.5" hot pluggable HDD bays</li> <li>• Processor: min. 4 cores processor, Pass mark CPU Mark 9000 or higher</li> <li>• Memory: min. 32 GB RAM</li> <li>• Flash memory: min. 512MB</li> <li>• Supported: min. 9 x 3.5" or 2.5" SATA HDD or SSD,</li> <li>• Ports: min. 4 x Gigabit RJ-45 Ethernet port, 2 x Dual-port 10 Gigabit Network Card with 10GBASE-T interface, min. 2 x USB port</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>Support min. USB printer, pen drive, USB hub, and USB UPS</li> <li>Support min. 4TB NAS Hard Drive, Enterprise RAID</li> <li>Included HDD: min. 12 x 4 TB SATA III , Class NAS, Cache 64 MB, Compatible with NAS</li> <li>Rack mount kit included</li> <li>Warranty: 1 year</li> <li>Commercial warranty as granted by the manufacturer.</li> </ul>			
5.8 2	<b>Storage</b> <ul style="list-style-type: none"> <li>NAS controller: Active – active dual controller for NAS</li> <li>Memory: min. 32 GB DDR</li> <li>Hard disk bays: min. 16 x 3.5” hot pluggable HDD bays</li> <li>Installed raw capacity: 160TB SAS 12Gb/s 7200RPM - 3.5" hot pluggable</li> <li>Network interfaces: min. 1x 1Gbps RJ45 Ethernet port per controller for management, min. 2x 10Gbps RJ45 Ethernet port per controller and min. 4x SFP+ port per controller. Possibility to install 40Gbe NIC card instead dual 10Gbps Ethernet card</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>RAID levels supported RAID 0, 1, 5, 6, 10, 50, 60, RAID TP, triple Mirror. Support for global hot spare</li> <li>Protocols min. CIFS/SMB3, NFS v4, FTP, HTTP, HTTPS, SSH, iSCSI, SNMP, SMTP</li> <li>Management: Graphical administrative interface over HTTP/HTTPS</li> <li>Hot-swappable fan module</li> <li>Dual hot pluggable power supply AC 220V/50Hz with power cables (min. length 3m)</li> <li>Ability to be installed in rack 19" with included set for rack mounting</li> <li>Warranty: 1 year</li> <li>Commercial warranty as granted by the manufacturer</li> </ul>			
5.9 1	<p><b>Blade enclosure:</b></p> <ul style="list-style-type: none"> <li>Blade chassis must support provisioning virtual, physical and container infrastructure</li> <li>Blade chassis must support attach storage (DAS) and FC SAN</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• Blade chassis must support template for: server BIOS, firmware, boot order, RAID, storage and network configuration</li> <li>• Must support linking multiple enclosures together to form single management ring and provide single console of management for connected enclosures</li> <li>• Must support storage sleds with flexible, granular drive-level assignment; drives can be mapped to a server or shared.</li> <li>• Support for hot-pluggable redundant switch or interconnect modules or Management modules with LAN and SAN connections which are located on devices (interconnect) outside of blade chassis.</li> <li>• Capacity redundant power supplies and fans included</li> <li>• Support for N+N PSU redundancy</li> <li>• Redundant management modules for configuring profiles of servers, single layer of management of compute, storage and fabrics, through redundant modules with fault-tolerant interlinking</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>• System (with one or more chassis in form single management ring) must include two or more storage nodes with minimum 32 x 1.8TB 10k drives each, and minimum 32 optional free space for future expansion or equivalent</li> <li>• System must be fully redundant, regarding all drives and servers</li> <li>• System (with one or more chassis in form single management ring) must include minimum 8 blade servers specified in items 5.10, and 4 free spaces for future expansion.</li> <li>• Must support unified simple interface manages compute, storage and networks; simplified administration to deploy and monitor at scale, from one to many chassis, with support for remote management, with auto-chassis and node discovery.</li> <li>• Installed switch or interconnect modules must ensure min. 8x10Gb Ethernet and min. 4x16Gb FC uplinks (including all necessary cable for uplink connection) or equivalent</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
5.10	<b>Blade server:</b> <ul style="list-style-type: none"> <li>Processors min. 2 x 14 core Passmark rate 16000 or better</li> <li>Min. 256 GB RAM memory (DDR4)</li> <li>Internal storage: min. 2 x 240GB M.2 SSD, supported additional 6 x 2.5“ HDD/SSD/NVMe media</li> <li>Storage controller with min. 6 GB DDR4 cache</li> <li>Network controller</li> <li>Integrated system management, including license (if required) for virtual power, remote boot and USB/CD/DVD mounting</li> <li>License for virtual environment for 8 servers (2 processors)</li> <li>Blade server must be in compatibility with Item 5.9.</li> <li>Installation into blade enclosure item 5.9 included</li> <li>Warranty: 1 year</li> <li>Commercial warranty as granted by the manufacturer</li> </ul>			
8				

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
5.11 4	<b>Rack Server:</b> <ul style="list-style-type: none"> <li>Product Type: max. 2U rack server with accessories for installation in 19" server racks</li> <li>Number of Processors Supported: 2, Number of Processors Installed: 2 processors, min. 12 cores each, CPU benchmark greater than 15000, Processor Speed: min. 2.10 GHz</li> <li>Motherboard with 1 x 1Gb/s RJ45 Ethernet for out of band management,</li> <li>Standard Memory: min. 128 GB included,</li> <li>Maximum Memory: Memory upgrade support min. 512Gb, Memory Technology: Dual Rank DDR4 @ 2666 MHz</li> <li>Number of Total Memory Slots: min. 24</li> <li>Total Hard Drive RAW Capacity: min. 7 TB, Number of Internal 2.5" Bays: min. 8, Installed HDDs: 8 x SAS 15k RPM 2.5" hot pluggable drives</li> <li>RAID Supported: Yes, SAS RAID Controller 12Gb/s with cache memory. Supported RAID levels 0, 1, 5, 6, 10, 50, 60.</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<ul style="list-style-type: none"> <li>I/O Expansions, Number of Total Expansion Bays: min 6, Min. 6x PCI-E slot 3.0: min. 2 x PCI-E slot 3.0 x16 slots and min. 4 x PCI-E 3.0 x8 slots</li> <li>Gigabit Ethernet network card, Min. installed 2 x 10Gb/s RJ45 or SFP+ with optical transceivers for multi-mode fibers), Optional: One 56Gbps FDR Infiniband with support for 40/50Gbps Ethernet card with 2 x QSFP ports, compatible with host interface PCI-E 3.0 x8</li> <li>Operating System: No</li> <li>Input Voltage: 230 V AC, Number of Power Supplies Supported: 2, Number of Power Supplies Installed: 2 with power cables length min 2.5m, Redundant Power Supply: Yes, Hot plug Power Supply, Energy Star: Yes, Environmentally Friendly: Yes</li> <li>1 Year technical support and hardware replacement</li> </ul>			

**Lot 6: PKI - HA appliance with integrated Sign Server and Timestamp server**

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
6.1. 1	<p><b>PKI - HA appliance with integrated Sign Server and Timestamp server</b></p> <p><b>PKI must include following:</b></p> <ul style="list-style-type: none"> <li>• Software for Certificate Authority (CA) to manage Public Key Infrastructure (PKI) without additional licensing costs</li> <li>• Common Criteria EAL 4+ certified component</li> <li>• Certificate Authority functionality with unlimited number of CAs</li> <li>• Support for operating multiple, independent PKI hierarchies within one installation</li> <li>• Registration Authority (RA) with role based access control</li> <li>• Validation Authority (VA) supporting CRL distribution and OCSP</li> <li>• Document signing, data signing, code signing and signing the contents of the chip of ID cards and travel documents</li> <li>• Time stamping</li> </ul>			



1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Application platform:</b></p> <ul style="list-style-type: none"> <li>• Web based application for administration and operation with Certification Authority</li> <li>• Build in functionality for backup and restore</li> <li>• Support for smart card protected crypto token activation</li> <li>• Support for separate administrator roles (support for K/N control of administrative access)</li> <li>• Remote logging (syslog)</li> <li>• Support for cluster (failover or high availability) with at least two node</li> </ul> <p><b>Hardware specifications:</b></p> <ul style="list-style-type: none"> <li>• Redundant power AC 220V/50Hz with suitable power cables</li> <li>• The unit must be mounted in standard 19" server rack cabinets with all mounting accessories</li> <li>• Complete set of authentication cards or USB tokens for the administrator (min. 50 cards or tokens)</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Required number of HSM with following specifications:</b></p> <ul style="list-style-type: none"> <li>• Network attached HSM with minimum 2 x RJ45 100/1000/10000 Mbps Ethernet</li> <li>• HSM can be with more separated partition/virtual hosts</li> <li>• Security certifications:</li> <li>• Min. FIPS 140-2 Level 2 and Level 3 certified</li> </ul> <p><b>Safety and environmental standards min.</b></p> <ul style="list-style-type: none"> <li>• Min. CE, FCC, RoHS2</li> <li>• Asymmetric cryptographic algorithms min. RSA, DSA, ECDSA, ECDH</li> <li>• Symmetric cryptographic algorithms min. AES, HMAC, Triple DES</li> <li>• Hash algorithms min. SHA-1, SHA-2 (224, 256, 384, 512 bit)</li> <li>• Cryptographic APIs min. PKCS#11, Java (JCE), Microsoft CAPI and CNG</li> </ul> <p><b>Signing operations minimum performance:</b></p> <ul style="list-style-type: none"> <li>• 100 signing operations per second for all algorithms</li> <li>• Issuance performance with activated/deactivated audit log:</li> <li>• Min. 5 certs/sec</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<b>Certificate capacity:</b> <ul style="list-style-type: none"> <li>• Min. number of supported certificates is 6 millions</li> <li>• SignServer for document signing, data signing, code signing with min. following specifications requirements:</li> <li>• ePassport Document Signer (MRTD)</li> <li>• PDF document processing, including support for visible signatures</li> <li>• XML signing and validation</li> <li>• Timestamp Server for time stamping with following min. specifications:</li> <li>• MS Authenticode-compliant time-stamps</li> <li>• Standard compliant RFC#3161 and RFC#5816 time-stamps</li> <li>• Leap second handling</li> <li>• Multiple time-stamp policies and signature algorithms</li> <li>• Configurable NTP time sources and monitoring of time synchronization</li> <li>• backup and restore procedures with smart card</li> <li>• Required number of application installation servers</li> <li>• Rack mounted or embedded in infrastructure</li> </ul>			

1	2	3	4	5
Item No. /Qty	Specification Required	Specifications Offered	Notes, remarks ref to documentation	Evaluation Committee's notes
	<p><b>Redundancy:</b></p> <ul style="list-style-type: none"> <li>• Offered solution must have High Availability (HA) - HA can be integrated in PKI Appliance (appliance must have cluster of key components) or can be achieved with more separate appliances</li> <li>• Training for 5 users [min. duration 3 (three) days, 6 hours per day]</li> <li>• Training materials must be on B&amp;H language</li> <li>• Training must be conducted in one of the BiH official languages</li> <li>• 1 year support</li> <li>• Warranty: 1 year</li> <li>• Commercial warranty as granted by the manufacturer</li> </ul>			