BIDDING DOCUMENTS

Expansion of AMRES data center virtualization and school network monitoring capacities
EIB-GtP/337-00-77/2023-06

Project: **Connected Schools in Serbia Facility B**
Project component: **Upgrades of the academic data network**
Purchaser: **Ministry of Information and**
                      Telecommunication
                      Nemanjina 22-26
Country: **Republic of Serbia**

Issued on: 22 June 2023

Table of Contents

PART 1 – Bidding Procedures

Table of Clauses
Section I. Instructions to Bidders

Section II. Bidding Data Sheet (BDS)

Section III. Evaluation and Qualification Criteria

Section IV. Bidding Forms

Section V. Eligible Countries

Section I. Instructions to Bidders (ITB)

A. General

1. Scope of Bid

1.1 In connection with the Specific Procurement Notice, Request for Bids (RFB), specified **in the Bid Data Sheet (BDS),** the Purchaser, as specified **in the BDS,** issues this bidding document for the supply of Goods and, if applicable, any Related Services incidental thereto, as specified in Section VI, Schedule of Requirements. The name, identification and number of lots (contracts) of this RFB are **specified in the BDS.**

1.2 The bid procedure will be carried out in line with EIB Guide to Procurement (GtP) and Serbian Law as long as aligned with the EIB GtP. In case of discrepancy the EIB GtP shall prevail. The Guide to Procurement is available at the following address:

https://www.eib.org/en/publications/guide-to-procurement.htm

1.3 Throughout this bidding document:

(a) the term "in writing" means communicated in written form (e.g. by mail, e-mail, fax, including if **specified in the BDS**, distributed or received through the electronic-procurement system used by the Purchaser) with proof of receipt;

(b) if the context so requires, "singular" means "plural" and vice versa; and

(c) "Day" means calendar day, unless otherwise specified as "Business Day". A Business Day is any day that is an official working day of the Borrower. It excludes the Borrower's official public holidays.

2. Source of Funds

2.1 The Borrower or Recipient (hereinafter called "Borrower") **specified in the BDS** has applied for or received financing (hereinafter called "funds") from **the European Investment Bank** (hereinafter called "the Bank") toward the cost of the project **named in the BDS.** The Borrower intends to apply a portion of the funds to eligible payments under the contract for which these Bidding Documents are issued.

2.2 Payments by the Bank will be made in accordance with the terms and conditions of the financing agreement between the Borrower and the Bank (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. Pursuant to its Sanctions Policy, the Bank shall not provide or otherwise make funds available, directly or indirectly, to or for the benefit of an individual or entity that is subject to financial sanctions imposed by the EU, either autonomously or pursuant to the financial sanctions decided by the United Nations Security Council on the basis of article 41 of the UN Charter. No party other than the

Borrower shall derive any rights from the Loan Agreement or have any claim to the to the proceeds of the Loan.

3. Fraud and Corruption

3.1. It is the Bank's policy to require that Borrowers (including beneficiaries of Bank loans), as well as bidders, suppliers, contractors, and consultants under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy[1], the Bank:

a) defines, for the purposes of this provision, the terms set forth below as follows:

- "Corrupt Practice" is the offering, giving, receiving or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party.

- "Fraudulent Practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation.

- "Coercive Practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of any party to influence improperly the actions of a party.

- "Collusive Practice" is an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party

- "Theft at EIB Group premises" is the misappropriation of property belonging to another party committed within EIB Group premises

- "Obstructive Practice" is (a) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (b) acts intended to materially impede the exercise of the EIB's contractual rights of audit or access to information or the rights that any banking, regulatory or examining authority or other equivalent body of the European Union or of its Member States may have in accordance with any law, regulation or treaty or pursuant to any agreement into which the EIB has entered in order to implement such law, regulation or treaty;

- "Misuse of EIB Group resources or assets" means any illegal activity committed in the use of the EIB Group's resources or assets, either knowingly or recklessly.

---

[1] See the EIB's Anti-Fraud Policy for definitions (http://www.eib.org/en/infocentre/publications/all/anti-fraud-policy.htm)

- "Money Laundering" is defined in the Bank's Anti-Fraud Policy

- "Terrorist Financing" is defined in the Bank's Anti-Fraud Policy

b)   In pursuance of this policy as set out in EIB's Anti-Fraud Policy, if it is established to the required standards that a project-related party has engaged in Prohibited Conduct in the course of a procurement process or implementation of a contract (to be) financed, the Bank:

- May seek appropriate remediation of the Prohibited Conduct to its satisfaction;

- May declare ineligible such project-related party to be awarded the contract; and/or

- May withhold the Bank's no objection to contract award and may apply appropriate contractual remedies, which may include suspension and cancellation, unless the Prohibited Conduct has been dealt with to the satisfaction of the Bank.

Furthermore, within the framework of its Exclusion Policy, the Bank may declare such project related party ineligible to be awarded a contract under any EIB project or to enter into any relationship with the Bank.

3.2.   In further pursuance of this policy, Bidders shall permit and shall cause their agents (where declared or not), sub-contractors, subconsultants, service providers, suppliers, and personnel, to permit the Purchaser, the Bank and auditors appointed by either of them, as well as any authority or European Union Institution or body having competence under European Union law, the right to inspect and copy the books and records of the tenderer, contractor, supplier or consultant in connection with any Bank-financed contract.

4. Eligible Bidders

4.1   A Bidder may be a firm that is a private entity, a state-owned enterprise or institution subject to ITB 4.6, or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the Bidding process and, in the event the JV is awarded the Contract, during contract execution. Unless specified **in the BDS**, there is no limit on the number of members in a JV.

4.2   The Purchaser requires that candidates, bidders, contractors, suppliers or consultants participating in an award procedure or a contract shall not have a conflict of interest. Conflict of interest occurs when the impartial

and objective exercise of the functions of the Bidder, or the respect of the principles of competition, non-discrimination or equality of treatment with regard to the procurement procedure or contract, is compromised for reasons involving family, emotional life, political or national affinity, economic interest or any other shared interest. The concept of conflict of interest covers any situation where staff members (or consultants acting on behalf) of the Purchaser who are involved in the conduct of the procurement procedure or may influence the outcome of that procedure have, directly or indirectly, a financial, economic or other personal interest which might be perceived to compromise their impartiality and independence in the context of the procurement procedure or contract execution. The Purchaser will not accept candidates or bidders affected by a conflict of interest in the award procedure in relation to the contract to be awarded under the concerned procedure. The assessment of whether or not there is a conflict of interest has to be carried out on a case by case basis, considering the actual risk of conflict based on the specific circumstances of the case at stake. The individual or entity in question should be allowed to present supporting evidence which might remove all suspicion of a conflict of interest. In cases where a conflict of interest cannot be effectively remedied by other less intrusive measures, the Bank requires the Purchaser to exclude from participation in an EIB-financed procurement procedure or contract any tenderer or supplier affected by such a conflict of interest.

Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this Bidding process, if the Bidder:

(a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or

(b) receives or has received any direct or indirect subsidy from another Bidder; or

(c) has the same legal representative as another Bidder; or

(d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the Bid of another Bidder, or influence the decisions of the Purchaser regarding this Bidding process; or

(e) or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or

(f) or any of its affiliates has been hired (or is proposed to be hired) by the Purchaser or Borrower for the Contract implementation; or

(g) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the

preparation or implementation of the project specified in the ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or

(h) has a close business or family relationship with a professional staff of the Borrower (or of the project implementing agency, or of a recipient of a part of the loan) who: (i) are directly or indirectly involved in the preparation of the bidding document or specifications of the Contract, and/or the Bid evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Bank throughout the Bidding process and execution of the Contract.

4.3 A firm that is a Bidder (either individually or as a JV member) shall not participate in more than one Bid, except for permitted alternative Bids. This includes participation as a subcontractor. Such participation shall result in the disqualification of all Bids in which the firm is involved. A firm that is not a Bidder or a JV member, may participate as a subcontractor in more than one Bid.

4.4 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB 4.7. A Bidder shall be deemed to have the nationality of a country if the Bidder is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed subcontractors or subconsultants for any part of the Contract including related Services.

4.5 A Bidder (either individually or as a JV member) may be ineligible if:

(i) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Purchaser's country prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country or

(ii) are subject to any economic, financial and trade restrictive measures and arms embargoes issued by the European Union pursuant to Chapter 2 of Title V of the Treaty on European Union as well as Article 215 of the Treaty on the Functioning of the European Union, as available in the official EU website

https://www.eeas.europa.eu/eeas/european-union-sanctions_en

as amended and supplemented from time to time or on any successor page.

4.6 Bidders that are state-owned enterprises or institutions in the Purchaser's Country may be eligible to compete and be awarded a Contract(s) only if they can establish, in a manner acceptable to the Bank, that they (i) are legally and financially autonomous (ii) operate under commercial law, and (iii) are not under supervision of the Purchaser.

4.7 Firms and individuals may be ineligible if so indicated in Section V and pursuant to its Sanctions Policy, the Bank shall not provide or otherwise make funds available, directly or indirectly, to or for the benefit of an individual or entity that is subject to financial sanctions imposed by the EU, either autonomously or pursuant to the financial sanctions decided by the United Nations Security Council on the basis of article 41 of the UN Charter.

4.8 A Bidder shall provide such documentary evidence of eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

4.9 The Bidders, its joint venture members, (sub-) contractors participating in this procurement procedure or a subsequent contract shall not violate or have violated any intellectual property rights.

4.10 The Bank requires mandatory compliance with the Bank's environmental and social safeguards. The Bidders, its joint venture members, and (sub-) contractors are required to comply with applicable labour laws and national and international standards of health and safety, including those contained in any relevant International Labour Organization (ILO) conventions and international standards and agreements on environmental protection. The Bank's environmental and social policies are available on the Bank's website: https://www.eib.org/en/publications/eib-environmental-and-social-standards

5. Eligible Goods and Related Services

5.1 All the Goods and Related Services to be supplied under the Contract and financed by the Bank may have their origin in any country in accordance with Section V, Eligible Countries.

5.2 For purposes of this ITB, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "related services" includes services such as insurance, installation, training, and initial maintenance.

The term "origin" means the country where the goods have been mined, grown, cultivated, produced, manufactured or processed; or, through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.

B. Contents of Bidding Documents

| 6. | Sections of Bidding Documents | 6.1 | The Bidding Documents consist of Parts 1, 2, and 3, which include all the Sections indicated below, and should be read in conjunction with any Addendum issued in accordance with ITB Clause 8. |

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bidding Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries

PART 2 Supply Requirements

- Section VI. Schedule of Requirements

PART 3 Contract

- Section VII. General Conditions of Contract (GCC)
- Section VIII. Special Conditions of Contract (SCC)
- Section IX. Contract Forms

6.2 The Specific Procurement Notice, Request for Bids (RFB), issued by the Purchaser is not part of this bidding document.

6.3 Unless obtained directly from the Purchaser, the Purchaser is not responsible for the completeness of the document, responses to requests for clarification, the Minutes of the pre-Bid meeting (if any), or Addendum to the bidding document in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Purchaser shall prevail.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding document and to furnish with its Bid all information or documentation as is required by the bidding document.

| 7. | Clarification of Bidding Documents | 7.1 | A prospective Bidder requiring any clarification of the Bidding Documents shall contact the Purchaser in writing at the Purchaser's address as **specified in the BDS**. |

7.2 The Purchaser will respond in writing to any request, provided that such request is received prior to the deadline for submission of bids within a period specified **in the BDS**.

7.3 The procedures for responding to requests are **specified in the BDS**.

7.4 Should the Purchaser deem it necessary to amend the Bidding Documents as a result of a clarification, it shall do so following the procedure under ITB Clause 8 and ITB Sub-Clause 24.2.

8. Amendment of Bidding Documents

8.1 At any time prior to the deadline for submission of Bids, the Purchaser may amend the Bidding Documents by issuing addendum.

8.2 Any addendum issued shall be part of the Bidding Documents and shall be promptly published on the Purchaser's **website specified in the BDS** no later than ten (10) days prior to deadline for submission of the bids as specified in ITB 24.1.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Purchaser may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB Sub-Clause 24.2

Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Purchaser shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Purchaser, shall be written in the language **as specified in the BDS.** Supporting documents and printed literature that are part of the Bid may be in another language **as specified in the BDS**.

11. Documents Comprising the Bid

11.1 The Bid shall comprise the following:

(a) Bid Submission Form and the applicable Price Schedule, in accordance with ITB Clauses 12, 14, and 15;

(b) Bid Security or Bid-Securing Declaration, in accordance with ITB Clause 21, if required;

(c) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB Clause 22;

(d) documentary evidence in accordance with ITB Clause 16 establishing the Bidder's eligibility to bid;

(e) documentary evidence in accordance with ITB Clause 17, that the Goods and Related Services to be supplied by the Bidder are of eligible origin;

(f) documentary evidence in accordance with **ITB** Clauses 18 and 30, that the Goods and Related Services conform to the Bidding Documents;

(g) documentary evidence in accordance with **ITB** Clause 19 establishing the Bidder's qualifications to perform the contract if its bid is accepted; and

(h) any other document **required in the BDS.**

11.2 In addition to the requirements under **ITB** 11.1, Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement.

12. Bid Submission Form and Price Schedules

12.1 The Bidder shall submit the Bid Submission Form using the form furnished in Section IV, Bidding Forms. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

12.2 The Bidder shall submit the Price Schedules for Goods and Related Services, according to their origin as appropriate, using the forms furnished in Section IV, Bidding Forms.

13. Alternative Bids

13.1 Unless otherwise **specified in the BDS,** alternative bids shall not be considered.

14. Bid Prices and Discounts

14.1 The prices and discounts quoted by the Bidder in the Bid Submission Form and in the Price Schedule shall conform to the requirements specified below.

14.2 All items must be listed and priced separately in the Price Schedule.

14.3 The price to be quoted in the Bid Submission Form shall be the total price of the bid, excluding any discounts offered.

14.4 The Bidder shall quote any unconditional discounts and indicate the method for their application in the Bid Submission Form.

14.5 The terms EXW, CIP, and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by The International Chamber of Commerce, as specified in the **BDS.**

14.6 Prices shall be quoted as specified in the Price Schedule included in Section IV, Bidding Forms. The disaggregation of price components is required solely for the purpose of facilitating the comparison of bids by the Purchaser. This shall not in any way limit the Purchaser's right to contract on any of the terms offered. In quoting prices, the Bidder shall be free to use transportation through carriers registered in any eligible country, in accordance with Section V Eligible Countries. Similarly, the Bidder may obtain insurance services from any eligible country in accordance with Section V Eligible Countries.

Prices shall be entered including:

(a) the price of the Goods, quoted DDP named place of destination, in the Purchaser's Country, as specified in the BDS. All items procured under this Contract will be exempt of import duties and taxes payable on imported goods and the value added tax on locally supplied goods based on the Finance Contract concluded between European Investment Bank and the Government of Serbia and therefore such customs duties and taxes should not be included in quoted prices.

(b) the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination (Project Site) (if a Contract is awarded to the Bidder), specified in the BDS;

(c) for Related Services, other than inland transportation and other services required to convey the Goods to their final destination, whenever such Related Services are specified in the Schedule of Requirements, the price of each item comprising the Related Services (inclusive of any applicable taxes).

14.7 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account, unless otherwise specified in the **BDS.** A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected, pursuant to ITB Clause 30. However, if in accordance with the **BDS,** prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, a bid submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero.

14.8 If so indicated in ITB Sub-Clause 1.1, bids are being invited for individual contracts (lots) or for any combination of contracts (packages). Unless otherwise indicated in the **BDS,** prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer any price reduction (discount) for the award of more than one Contract shall specify the applicable price reduction in

accordance with ITB Sub-Clause 14.4 provided the bids for all lots are submitted and opened at the same time.

15. Currencies of Bid	15.1	The Bidder shall quote in the currency of the Purchaser's Country the portion of the bid price that corresponds to expenditures incurred in the currency of the Purchaser's country, unless otherwise specified in the **BDS.**
	15.2	Unless otherwise specified in the **BDS,** the Bidder may express the bid price in the currency of any country in accordance with Section V, Eligible countries. If the Bidder wishes to be paid in a combination of amounts in different currencies, it may quote its price accordingly but shall use no more than three currencies in addition to the currency of the Purchaser's Country.
16. Documents Establishing the Eligibility of the Bidder	16.1	To establish their eligibility in accordance with ITB Clause 4, Bidders shall complete the Bid Submission Form, Bidder Information Form and, if applicable, Joint Venture Partner Information Form, included in Section IV, Bidding Forms.
17. Documents Establishing the Eligibility of the Goods and Related Services	17.1	To establish the eligibility of the Goods and Related Services in accordance with ITB Clause 5, Bidders shall complete the country of origin declarations in the Technical Specification Form, included in Section VI, Schedule of Requirements.
18. Documents Establishing the Conformity of the Goods and Related Services	18.1	To establish the conformity of the Goods and Related Services to the Bidding Documents, the Bidder shall furnish as part of its Bid the documentary evidence that the Goods conform to the technical specifications and standards specified in Section VI, Schedule of Requirements.
	18.2	The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed item by item description of the essential technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods and Related Services to the technical specification, and if applicable, a statement of deviations and exceptions to the provisions of the Section VI, Schedule of Requirements.
	18.3	The Bidder shall also furnish a list giving full particulars, including available sources and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the Goods during the period **specified in the BDS** following commencement of the use of the goods by the Purchaser.
	18.4	Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by

the Purchaser in the Section VI, Schedule of Requirements, are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Purchaser's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in the Schedule of Requirements.

19. Documents Establishing the Qualifications of the Bidder	19.1 The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted shall establish to the Purchaser's satisfaction:

(a) that, if **required in the BDS,** a Bidder that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section IV, Bidding Forms to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in the Purchaser's Country;

(b) that, if **required in the BDS,** in case of a Bidder not doing business within the Purchaser's Country, the Bidder is or will be (if awarded the contract) represented by an Agent in the country equipped and able to carry out the Supplier's maintenance, repair and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications; and

(c) that the Bidder meets each of the qualification criterion specified in Section III, Evaluation and Qualification Criteria.

20. Period of Validity of Bids	20.1 Bids shall remain valid for the period **specified in the BDS** or any extended date if amended by the Purchaser in accordance with **ITB 8.** A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Purchaser may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB Clause 21, it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its bid, except as provided in ITB Sub-Clause 20.3.

20.3 In the case of fixed In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Bid price shall be adjusted by the following factor(s): For foreign currency: HICP (Harmonised Index of Consumer Prices) published by EURSTAT

http://appsso.EURstat.ec.EURpa.eu/nui/show.do?dataset=prc_hicp_mmor&lang=en

For domestic currency: the source of index is the National Bank of Serbia. The local currency portion of the Contract price shall be adjusted by a factor reflecting local inflation during the period of extension; the foreign currency portion of the Contract price shall be adjusted by a factor reflecting international inflation (in the country of the foreign currency) during the period of extension.

Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.

21. Bid Security   21.1   The Bidder shall furnish as part of its bid, a Bid Security or a Bid-Securing Declaration, if required, as **specified in the BDS.**

21.2   If a Bid Security is specified pursuant to ITB 21.1, the Bid Security shall be in the amount and currency specified in the BDS, and shall:

(a) be in the form of a bank guarantee from a banking institution;

(b) be issued by a reputable institution selected by the Bidder and located in any eligible country.

(c) be substantially in accordance with the form of Bid Security included in Section IV, Bidding Forms, or other form approved by the Purchaser prior to bid submission;

(d) be payable promptly upon written demand by the Purchaser in case the conditions listed in ITB Clause 21.5 are invoked;

(e) be submitted in its original form; copies will not be accepted;

(f) remain valid for a period of 28 days beyond the validity period of the bids, as extended, if applicable, in accordance with ITB Clause 20.2;

21.3   If a Bid Security or a Bid-Securing Declaration is required in accordance with ITB Sub-Clause 21.1, any bid not accompanied by a substantially responsive Bid Security or Bid Securing Declaration in accordance with ITB Sub-Clause 21.1, shall be rejected by the Purchaser as non-responsive.

21.4   The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the Performance Security pursuant to ITB Clause 46.

21.5   The Bid Security may be forfeited or the Bid Securing Declaration executed:

(a)   if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Submission Form, except as provided in ITB Sub-Clause 20.2; or

(b)   if the successful Bidder fails to:

(i)   sign the Contract in accordance with ITB Clause 45;

(ii)   furnish a Performance Security in accordance with ITB Clause 46.

22. Format and Signing of Bid

22.1   The Bidder shall prepare one original of the documents comprising the bid as described in ITB Clause 11 and clearly mark it "ORIGINAL." In addition, the Bidder shall submit copies of the bid, in the number specified in the **BDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2   Bidders shall mark as "CONFIDENTIAL" information in their Bids which is confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.

22.3   The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the **BDS** and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid where entries or amendments have been made shall be signed or initialled by the person signing the Bid.

22.4   In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.

22.5   Any interlineation, erasures, or overwriting shall be valid only if they are signed or initialled by the person signing the Bid.

D. Submission and Opening of Bids

23. Submission, Sealing and Marking of Bids

23.1   The Bidder shall deliver the Bid in a single, sealed envelope (one-envelope Bidding process). Within the single envelope the Bidder shall place the following separate envelopes:

(a)   in an envelope marked "ORIGINAL", all documents comprising the Bid, as described in ITB 11; and

(b)   in an envelope marked "COPIES", all required copies of the Bid in the number of copies as specified in the **BDS**;

23.2   The inner and outer envelopes shall:

(a)   Bear the name and address of the Bidder;

(b)   be addressed to the Purchaser in accordance with ITB Sub-Clause 24.1;

(c)   bear the specific identification of this bidding process indicated in ITB 1.1 and any additional identification marks as **specified in the BDS;** and

(d)   bear a warning not to open before the time and date for bid opening, in accordance with ITB Sub-Clause 27.1.

23.3   If all envelopes are not sealed and marked as required, the Purchaser will assume no responsibility for the misplacement or premature opening of the bid.

24. Deadline for Submission of Bids

24.1   Bids must be received by the Purchaser at the address and no later than the date and time **specified in the BDS.**

24.2   The Purchaser may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Documents in accordance with ITB Clause 8, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

25. Late Bids

25.1   The Purchaser shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB Clause 24. Any bid received by the Purchaser after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

26. Withdrawal, Substitution, and Modification of Bids

26.1   A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice in accordance with ITB Clause 23, duly signed by an authorized representative, and shall include a copy of the authorization (the power of attorney) in accordance with ITB Sub-Clause 22.3, (except that withdrawal notices require no copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be:

(a)   Prepared and submitted in accordance with ITB Clauses 22 and 23 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," or "MODIFICATION;" and

(b)   received by the Purchaser prior to the deadline prescribed for submission of bids, in accordance with ITB Clause 24.

26.2   Bids requested to be withdrawn in accordance with ITB Sub-Clause 26.1 shall be returned unopened to the Bidders.

26.3   No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Purchaser on the Bid Submission Form or any extension thereof.

27. Bid Opening   27.1   Except as in the cases specified in **ITB 25** and **ITB 26.2**, the Purchaser shall, at the Bid opening, publicly open and read out all Bids received by the deadline at the date, time and place specified **in the BDS** in the presence of Bidders' designated representatives and anyone who chooses to attend.

27.2   First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. If the withdrawal envelope does not contain a copy of the "power of attorney" confirming the signature as a person duly authorized to sign on behalf of the Bidder, the corresponding bid will be opened. No Bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.

27.3   Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Bid being substituted, and the substituted Bid shall not be opened, but returned to the Bidder. No Bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening.

27.4   Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Bid. No Bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Bid opening.

27.5   Next, all other envelopes shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the Total Bid Price, including any discounts and alternative offers; the presence or absence of a Bid Security or Bid-Securing Declaration, if required; and any other details as the Purchaser may consider appropriate.

27.6   Only Bids and discounts that are opened and read out at Bid opening shall be considered further in the evaluation. The Bid Submission Form

and the Price Schedules are to be initialled by representatives of the Purchaser attending Bid opening in the manner specified **in the BDS.**

27.7   The Purchaser shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 25.1) at Bid opening.

27.8   The Purchaser shall prepare a record of the Bid opening that shall include, as a minimum:

- the name of the Bidder and whether there is a withdrawal, substitution, or modification;

- the Total Bid Price, per lot if applicable, including any discounts,

- the presence or absence of a Bid Security or Bid-Securing Declaration, if one was required.

27.9   The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted their bids before bid submission deadline.

E. Evaluation and Comparison of Bids

28. Confidentiality

28.1   Information relating to the examination, evaluation, comparison, and postqualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process, until the Purchaser transmits to all Bidders the Notification of Intention to Award the Contract in accordance with ITB 39.1.

28.2   Any effort by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and postqualification of the Bids or contract award decisions may result in the rejection of its Bid.

28.3   Notwithstanding ITB Sub-Clause 28.2, from the time of bid opening to the time of Contract Award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.

29. Clarification of Bids

29.1   To assist in the examination, evaluation, comparison and post-qualification of the Bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder in respect to its Bid and that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing. No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors

discovered by the Purchaser in the Evaluation of the bids, in accordance with ITB Clause 31.

29.2 If a Bidder does not provide complete and satisfactory clarifications of its Bid by the date and time set in the Purchaser's request for clarification, its Bid may be rejected.

(a) Communication

29.3 By submitting a Bid, each Bidder accepts to receive requests for clarification pursuant to **ITB 29.1** and notification(s) of the outcome of the procedure by electronic means (email). Such requests and/or notifications shall be sent with the request for confirmation of the receipt of the notification, and shall be deemed to have been received by the Bidder on the date of the confirmation. The Purchaser shall send notifications/requests to the electronic address referred to in the Bid, specified in the Bidder Information Form.

(b) Abnormally Low Bids

29.4 An Abnormally Low Bid is one where the Bid price, in combination with other constituent elements of the Bid, appears unreasonably low to the extent that the Bid price raises material concerns with the Purchaser as to the capability of the Bidder to perform the Contract for the offered Bid price.

29.5 In the event of identification of a potentially Abnormally Low Bid, the Purchaser shall seek written clarification from the Bidder, including a detailed price analyses of its Bid price in relation to the subject matter of the contract, scope, delivery schedule, allocation of risks and responsibilities and any other requirements of the bidding document. The elements of the clarification may include explanations on:

a) the economics of the manufacturing process, of the services provided or of the construction method;
b) the technical solutions chosen or any exceptionally favourable conditions available to the tenderer for the supply of the products or services or for the execution of the work;
c) the originality of the work, supplies or services proposed by the tenderer;
d) compliance with applicable obligations in the fields of environmental, social and labour law established by European Union law, national law, collective agreements or by the international environmental, social and labour law provisions listed in Annex X of The Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement, available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0024
e) engagement of the subcontractors;

29.6 After evaluation of the price analyses, in the event that the Purchaser determines that the Bidder has failed to demonstrate its capability to

perform the contract for the offered Bid price, the Purchaser may reject the Bid.

30. Responsiveness of Bids

30.1 During the evaluation of Bids, the following definitions apply:

(a) "Deviation" is a departure from the requirements specified in the bidding document;

(b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the bidding document; and

(c) "Omission" is the failure to submit part or all of the information or documentation required in the bidding document.

30.2 The Purchaser's determination of a Bid's responsiveness is to be based on the contents of the Bid itself.

30.3 A substantially responsive Bid is one that conforms to all the terms, conditions, and specifications of the Bidding Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

(a) affects in any substantial way the scope, quality, or performance of the Goods and Related Services specified in the Contract; or

(b) limits in any substantial way, inconsistent with the Bidding Documents, the Purchaser's rights or the Bidder's obligations under the Contract; or

(c) if rectified would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

30.4 If a bid is not substantially responsive to the Bidding Documents, it shall be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.

31. Nonconformities, Errors, and Omissions

31.1 Provided that a Bid is substantially responsive, the Purchaser may waive any non-conformities in the Bid that do not constitute a material deviation, reservation, or omission.

31.2 Provided that a bid is substantially responsive, the Purchaser may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

31.3 Provided that the Bid is substantially responsive, the Purchaser shall correct arithmetical errors on the following basis:

(a) if there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of the Purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the line item total as quoted shall govern and the unit price shall be corrected;

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

31.4 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with **ITB 31.3,** shall result in the rejection of the Bid.

32. Preliminary Examination of Bids

32.1 The Purchaser shall examine the Bids to confirm that all documents and technical documentation requested in **ITB 11** have been provided, and to determine the completeness of each document submitted.

32.2 The Purchaser shall confirm that the following documents and information have been provided in the Bid. If any of these documents or information is missing, the offer shall be rejected:

(a) Bid Submission Form, in accordance with ITB Sub-Clause 12.1;

(b) Price Schedule, in accordance with ITB Sub-Clause 12.2;

(c) Bid Security or Bid Securing Declaration, in accordance with ITB Clause 21, if applicable.

(d) Technical Specification Form as per Schedule VI, Schedule of Requirements

If any of the other documents or information requested in ITB 11 is missing, it will not constitute a material omission in terms of ITB 30.3 and the Purchaser reserves the right to request clarification from the Bidder as per ITB 29.

33. Examination of Terms and Conditions; Technical Evaluation	33.1	The Purchaser shall examine the Bid to confirm that all terms and conditions specified in the GCC and the SCC have been accepted by the Bidder without any material deviation or reservation.
	33.2	The Purchaser shall evaluate the technical aspects of the Bid submitted in accordance with ITB Clause 18, to confirm that all requirements specified in Section VI, Schedule of Requirements of the Bidding Documents have been met without any material deviation or reservation.
	33.3	If, after the examination of the terms and conditions and the technical evaluation, the Purchaser determines that the Bid is not substantially responsive in accordance with ITB Clause 30, it shall reject the Bid.
34. Conversion to Single Currency	34.1	For evaluation and comparison purposes, the Purchaser shall convert all bid prices expressed in amounts in various currencies into an amount in a single currency **specified in the BDS,** using the middle exchange rates established by the source and on the date **specified in the BDS.**
35. Evaluation of Bids	35.1	The Purchaser shall evaluate each bid that has been determined, up to this stage of the evaluation, to be substantially responsive.
	35.2	To evaluate a Bid, the Purchaser shall only use all the factors, methodologies and criteria defined in ITB Clause 35. No other criteria or methodology shall be permitted.
	35.3	To evaluate a Bid, the Purchaser shall consider the following:

    (a)   evaluation will be done for Items or Lots, as **specified in the BDS;** and the Bid Price as quoted in accordance with clause ITB 14;

    (b)   price adjustment for correction of arithmetic errors in accordance with ITB Sub-Clause 31.3;

    (c)   price adjustment due to discounts offered in accordance with ITB Sub-Clause 14.4;

    (d)   converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 34

    (e)   the application of the evaluation criteria **specified in the BDS** and those set out in Section III, Evaluation and Qualification Criteria;

    35.4   The Purchaser's evaluation of a bid will exclude and not take into account:

(a) In the case of Goods manufactured in the Purchaser's Country, sales and other similar taxes, which will be payable on the goods if a contract is awarded to the Bidder;

(b) in the case of Goods manufactured outside the Purchaser's Country, already imported or to be imported, customs duties and other import taxes levied on the imported Good, sales and other similar taxes, which will be payable on the Goods if the contract is awarded to the Bidder;

(c) any allowance for price adjustment during the period of execution of the contract, if provided in the bid.

35.5 The Purchaser's evaluation of a bid may require the consideration of other factors, in addition to the Bid Price quoted in accordance with ITB Clause 14. These factors may be related to the characteristics, performance, and terms and conditions of purchase of the Goods and Related Services. The effect of the factors selected, if any, shall be expressed in monetary terms to facilitate comparison of bids, unless otherwise specified in Section III, Evaluation and Qualification Criteria. The factors, methodologies and criteria to be used shall be as specified in ITB 35.3 (e).

35.6 If so **specified in the BDS,** these Bidding Documents shall allow Bidders to quote separate prices for one or more lots, and shall allow the Purchaser to award one or multiple lots to more than one Bidder. The methodology of evaluation to determine the lowest-evaluated lot combinations, is specified in Section III, Evaluation and Qualification Criteria.

36. Comparison of Bids

36.1 The Purchaser shall compare the evaluated costs of all substantially responsive Bids established in accordance with ITB 30 to determine the Bid that has the lowest evaluated price.

37. Postqualification of the Bidder

37.1 The Purchaser shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated bid and substantially responsive Bid meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

37.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 19. The determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, affiliates, subcontractors (other than specialized subcontractors if permitted in the bidding document), or any other firm(s) different from the Bidder.

37.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event the Purchaser shall

proceed to the next lowest evaluated Bid to make a similar determination of that Bidder's capabilities to perform satisfactorily.

38. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids	38.1	The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to Contract Award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.
39. Standstill Period	39.1	The Contract shall not be awarded earlier than the expiry of the Standstill Period. The Standstill Period shall be ten (10) days unless extended in accordance with **ITB 44.2 and 47.2.** The Standstill Period commences the day after the date the Purchaser has transmitted to each Bidder the Notification of Intention to Award the Contract.
40. Notification of Intention to Award	40.1	Prior to the expiration of the Bid validity, the Purchaser shall notify in writing each Bidder by sending the Notification of Intention to Award the Contract to the successful Bidder. The Notification of Intention to Award shall contain, at a minimum, the following information:

(a) the name and address of the Bidder submitting the successful Bid;

(b) the Contract price of the successful Bid;

(c) the names of all Bidders who submitted Bids, and their Bid prices as readout, and as evaluated;

(d) a statement of the reason(s) the Bid (of the unsuccessful Bidder to whom the notification is addressed) was unsuccessful, unless the price information in c) above already reveals the reason;

(e) the expiry date of the Standstill Period;

(f) instructions on how to request a debriefing and/or submit a complaint during the standstill period.

F. Award of Contract

41. Award Criteria	41.1	The Purchaser shall award the Contract to the Bidder whose Bid has been determined to offer the lowest evaluated price and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
42. Purchaser's Right to Vary Quantities at	42.1	At the time of the Contract performing, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in Section VI, Schedule of

Time of Performing	Requirements, provided this does not exceed the percentages **specified in the BDS,** and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Documents.

43. Notification of Award

43.1 Prior to the date of expiry of the Bid validity and upon expiry of the Standstill Period, specified in ITB 39.1 or any extension thereof, and upon satisfactorily addressing any complaint that has been filed within the Standstill Period, the Purchaser shall notify the successful Bidder, in writing, that its Bid has been accepted. The notification of award shall specify the sum that the Purchaser will pay the Supplier in consideration of the execution of the Contract (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price").

43.2 Within ten (10) Business Days from the date of notification of award, the Purchaser shall publish the Contract Award Notice which shall contain, at a minimum, the following information:

(a) name and address of the Purchaser;

(b) name and reference number of the contract being awarded, and the selection method used;

(c) the name of the successful Bidder, the final total contract price, the contract duration and a summary of its scope;

43.3 The Contract Award Notice shall be published on the Purchaser's website with free access if available, or in at least one newspaper of national circulation in the Purchaser's Country, or in the official gazette. The Purchaser shall also publish the contract award notice in OJEU online.

44. Debriefing by the Purchaser

44.1 On receipt of the Purchaser's Notification of Intention to Award referred to in ITB 40.1, an unsuccessful Bidder has three (3) Business Days to make a written request to the Purchaser for a debriefing. The Purchaser shall provide a debriefing to all unsuccessful Bidders whose request is received within this deadline. The Purchaser shall promptly respond in writing to any unsuccessful Bidder who requests a debriefing, and send the copy of the request or decision on appeal to the Bank.

44.2 Where a request for debriefing is received within the deadline, the Purchaser shall provide a debriefing within five (5) Business Days, unless the Purchaser decides, for justifiable reasons, to provide the debriefing outside this timeframe. In that case, the standstill period shall automatically be extended until five (5) Business Days after such debriefing is provided. If more than one debriefing is so delayed, the standstill period shall not end earlier than five (5) Business Days after the last debriefing takes place. The Purchaser

shall promptly inform, by the quickest means available, all Bidders of the extended standstill period.

44.3 Where a request for debriefing is received by the Purchaser later than the three (3)-Business Day deadline, the Purchaser should provide the debriefing as soon as practicable, and normally no later than fifteen (15) Business Days from the date of publication of Public Notice of Award of contract. Requests for debriefing received outside the three (3)-day deadline shall not lead to extension of the standstill period.

44.4 Debriefings of unsuccessful Bidders may be done in writing or verbally. The Bidders shall bear their own costs of attending such a debriefing meeting. Debriefing Meeting Minutes will be issued by the Purchaser and distributed to all Bidders and the Bank.

45. Signing of Contract

45.1 Promptly after standstill period expiration, the Purchaser shall send to the successful Bidder the Notification of Award including the Contract Agreement.

45.2 The successful Bidder shall sign, date and return to the Purchaser, the Contract Agreement within eight (8) Business days of its receipt.

45.3 Notwithstanding ITB 45.2 above, in case signing of the Contract Agreement is prevented by any export restrictions attributable to the Purchaser, to the country of the Purchaser, or to the use of the products/goods, systems or services to be supplied, where such export restrictions arise from trade regulations from a country supplying those products/goods, systems or services, the Bidder shall not be bound by its Bid, always provided however, that the Bidder can demonstrate to the satisfaction of the Purchaser and of the Bank that signing of the Contact Agreement has not been prevented by any lack of diligence on the part of the Bidder in completing any formalities, including applying for permits, authorizations and licenses necessary for the export of the products/goods, systems or services under the terms of the Contract.

<table>
<tr><td>**46. Performance Security**</td><td>46.1</td><td>Within twenty-eight (28) days of the receipt of notification of award from the Purchaser, the successful Bidder, if required, shall furnish the Performance Security in accordance with the GCC, using for that purpose the Performance Security Form included in Section IX Contract forms, or another Form acceptable to the Purchaser. The Purchaser shall promptly notify the name of the winning Bidder to each unsuccessful Bidder and discharge the Bid Securities of the unsuccessful bidders pursuant to ITB Sub-Clause 21.4.</td></tr>
<tr><td></td><td>46.2</td><td>Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security or execution of the Bid-Securing Declaration. In that event the Purchaser may award the Contract to the next the lowest evaluated bid, whose offer is substantially responsive, and is determined by the Purchaser to be qualified to perform the Contract satisfactorily.</td></tr>
<tr><td>47 **Procurement Related Complaint**</td><td>47.1</td><td>Bidders should alert the Purchaser in writing, with a copy to the European Investment Bank, in case they should consider that certain clauses or technical specifications of the bidding documents might limit international competition or introduce an unfair advantage to some bidders.</td></tr>
<tr><td></td><td>47.2</td><td>The procedures for making a Procurement-related Complaint are as specified in the BDS.</td></tr>
</table>

Section II. Bidding Data Sheet (BDS)

The following specific data for the goods to be procured shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

ITB Clause Reference	A. General
ITB 1.1	The reference number of the Request for Bids (RFB) is: **EIB-GtP/ 337-00-77/2023-06** The Purchaser is: **The Ministry of Information and Telecommunications, Belgrade, Serbia** The name of the RFB is: **Expansion of AMRES data center virtualization and school network monitoring capacities** The tender procedure is carried out in line with EIB GtP (https://www.eib.org/en/publications/guide-to-procurement.htm) and the national law as along as aligned with EIB GtP. In case of discrepancies the EIB GtP shall prevail.
ITB 2.1	The Borrower is: **The Republic of Serbia** The name of the Project is: **Connected Schools in Serbia Facility B**
ITB 4.1	The maximum number of members in a Joint Venture (JV) shall be: **4**
	B. Contents of Bidding Documents
ITB 7.1, 7.2 and 7.3	For **Clarification of bid purposes** only, the Purchaser's address is: Ministry of Information and Telecommunications Attention: Sector for European integrations and Project Management Electronic mail address: internationalpublicprocurement@mit.gov.rs The Purchaser will respond in writing to any request for clarification, provided that such request is received no later than **15** (**fifteen**) **days** before the deadline for submission of Bids as specified in ITB 24.1. The Purchaser will provide answers to such requests within **1** (**one**) **week**. The Purchaser shall forward copies of its response to all Bidders who have acquired the Bidding documents in accordance with **ITB 6.3**, including a description of the inquiry but without identifying its source.

	The Purchaser shall promptly publish its response including the description of the inquiry but without identifying its source, at the web page: http://www.mit.gov.rs
ITB 8.2	Any addendum to the Bidding Documents shall be published on the following website: http://www.mit.gov.rs
	C. Preparation of Bids
ITB 10.1	The language of the bid is **English.** All correspondence exchange shall be **in English.** Language for translation of supporting documents/documentary evidence and printed literature is **English or Serbian, except for documents and evidence made in Serbian or issued by the relevant authority in Serbian language.** The translation of the documents may be submitted as uncertified translation under condition a true and accurate translation is provided.
ITB 11.1	The Bidder shall submit the following documents in its bid in the following order: 1. **Bid Submission Form** 2. **Authorisation:** Written confirmation authorizing the signatory of the Bid 3. **Bidder Information Form** and attachments 4. **Joint Venture Partner Information Form** and attachments, if applicable 5. **Joint Venture Agreement** (or proposed JV Agreement in case of intent to form the JV), if applicable**.** JV Agreement must contain information on split of work and responsibilities of each of the JV member. 6. **Technical Specification Form,** per given template in Section IV, Bid Forms and attachments (e.g. technical documentation) 7. **Covenant of Integrity (CoI)** per given template in Section IV, Bid Forms (in case of JV, signed by each JV member) 8. **Environmental and Social Covenant** per given template in Section IV, Bid Forms (in case of JV, signed by each JV members) 9. **Bid Security (Bank Guarantee)** 10. **Price Schedule Form** 11. **Documentary evidence as required in Section III - Evaluation and Qualification Criteria** (including Manufacturer's Authorization) All other documents defined by Bidding document. In case the Bid is submitted by a Joint Venture, **each member** must sign and submit the Covenant of Integrity (CoI) and the Environmental and Social Covenant.

	IMPORTANT: It should be noted that, in the Covenant of Integrity, the Bidder are requested to self-declare all sanctions and / or exclusions (including any similar decisions having the effect of imposing conditions on the Bidder or his subsidiaries or to exclude the said bidder or its subsidiaries, such as temporary suspension, conditional non-exclusion, etc.) imposed by the European institutions or any multilateral Development Bank (including the World Bank Group, the African Development Bank, the Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank or Inter-American Development Bank), regardless of the date of issue and the expiration or not of such decisions and of the current status of any sanction and / or exclusion. In this regard, any omission or misrepresentation made knowingly or recklessly, may be considered as fraud under the EIB Anti-Fraud Policy. Therefore, the Client reserves the right to reject any bid presenting an inaccurate or incomplete Covenant of Integrity, and cause the rejection of the Bid for prohibited conduct.
ITB 14.5	The Incoterms edition is **the latest edition published by the International Chamber of Commerce, 38 Cours Albert 1er, 75008 Paris, France the official web site at http://www.iccwbo.org/index_incoterms.asp**
ITB 14.6	Bid Price should be quoted: **DDP** (**Delivered Duty Paid**) The Bid price is the total price of the subject of procurement, including all the accompanying and dependent costs incurred by the Bidder in the execution of the procurement in question. All items procured under this Contract Agreement **will be exempt of import duties and taxes payable on imported goods and the value added tax on locally supplied goods** based on the Finance Contract concluded between European Investment Bank and the Government of Serbia. Prices for delivered goods will be quoted DDP (Delivered Duty Paid), **however no import duties and taxes payable on imported goods and the value added tax on locally supplied goods should be included in price**. The Purchaser will support the selected Bidder (Supplier) in any reasonable way to complete import or tax exemption procedure, but it is the Supplier's sole responsibility to carry out all customs / tax formalities as well to bear any costs and risks involved in bringing the goods to the place of destination. **Final places of destination**, as per Incoterms used, are school administration, primary and high schools, geographically evenly distributed throughout the territory of the Republic of Serbia, where delivery will be carried out in accordance with the Technical Specifications from the bidding documentation for the given procurement. The Final Destination is:

	Academic and Research Network of Republic of Serbia Boulevard Kralja Aleksandra 90, 11000 Belgrade, The Republic of Serbia
ITB 14.7	The prices quoted by the Bidder **shall not be** adjustable. The prices are fixed (not subject to change).
ITB 14.8	The goods/services and quantities indicated shall be indivisible. Prices quoted shall correspond to 100 % of the items specified and to 100% of the quantities specified for each item indicated for this procurement. Bids for only part of the items or quantities shall be rejected. If a Price Schedule shows items listed but not priced and a Technical Specification form is fulfilled for them, their prices shall be assumed to be included in the prices of other items. If a Price Schedule shows items listed but not priced and they could not be found in any other part of the bid, the bid will be considered incomplete and as such rejected. An item not listed in the Price Schedule shall be assumed to be not included in the bid, the bid will be considered incomplete and as such rejected.
ITB 15.1	The Bidder **is not required** to quote in the currency of the Purchaser's Country the portion of the bid price that corresponds to expenditures incurred in that currency.
ITB 15.2	**The currency of the bid is European Economic and Monetary Union Euro (EUR).** Payments shall be made to the Supplier's account in currency of the bid if the Supplier is not a resident of the Republic of Serbia. In case the Supplier is a resident of the Republic of Serbia payments shall be made in RSD according to the middle exchange rate of the National Bank of Serbia on the date of issuing of invoice/proforma invoice to the extent mandatory by local law.
ITB 18.3	No list of spare parts needs to be furnished.
ITB 19.1 (a)	Manufacturer's authorization is: **Required for all items** (items #1-12 in the Price Schedule) Details for this requirement are provided in Section III - Evaluation and Qualification Criteria.

ITB 19.1 (b)	After sales service is: Not **required** Details for this requirement are provided in Section III - Evaluation and Qualification Criteria.
ITB 20.1	The bid validity period shall be **120** days from the date of opening of the bids.
ITB 21.1	A Bid shall include a Bid Security per format provided in Section IV Bidding Forms.
ITB 21.2	A **Bid Security shall be** in the form of an unconditional, irrevocable and payable on first call bank guarantee issued by a bank. The amount and currency of the bid security shall be: **25,000 EUR** with a validity term not shorter than the validity period of the offer plus 28 days (148 days in total). For the Bidders from the Purchaser's Country: Payable in RSD at the middle exchange rate of The National Bank of Serbia on the day invoking of the guarantee.
ITB 22.1	In addition to the original of the bid, the number of copies is**: 1 (one) copy, plus 1 CD with electronic copy of the bid** (all documents in PDF format)
ITB 22.3	The written confirmation of authorization to sign on behalf of the Bidder shall consist of an official document attesting authorization to sign (e.g., Company registration document) or Power of Attorney issued by the authorized person. In case the Bidder is a Joint Venture (JV), the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
	D. Submission and Opening of Bids
ITB 23.2 (c)	The inner and outer envelopes shall bear the following additional identification marks: **Expansion of AMRES data center virtualization and school network monitoring capacities, procurement no. EIB-GtP/ 337-00-77/2023-06** Additionally, to the instructions in ITB 23, the outer envelopes shall bear the following warning: " DO NOT OPEN BEFORE THE TIME AND DATE FOR BID OPENING / "NE OTVARATI PRE SEDNICE ZA OTVARANJE PONUDA"

ITB 24.1	**For bid submission purposes only, the Purchaser's address is:** Attention: **Ministry of Information and Telecommunications** Street Address: **no. 22-26, Nemanjina street** City: **Belgrade** ZIP/Postal Code: **11000** Country: **The Republic of Serbia** **The deadline for bid submission is:** Date: August 07th, 2023 Time: **not later than 10:00 a.m. by local time**
ITB 27.1	**The bid opening shall take place at:** Street Address: **no. 22-26, Nemanjina street** City: **Belgrade** ZIP/Postal Code: **11000** Country: **The Republic of Serbia** Date: August 07th, 2023 Time: **at 10:30 a.m. by local time**
ITB 27.6	The Bid Submission Form of each received Bid shall be initialled by 3 (three) representatives of the Purchaser conducting Bid opening.
	E. Evaluation and Comparison of Bids
ITB 34.1	Evaluation and comparison of bids shall be conducted in the currency of the bid (EUR) as per ITB 15.2.
ITB 35.2	The Purchaser may request that the Bidder provide inspection samples for the bid and submit any additional documentation necessary for evaluating the technical aspects of the bid but no amendment to the substance of the bid or to the price can be accepted after the bid opening.
ITB 35.3(a)	The evaluation of the bids will be done for the whole contract (all items). The Bid has to satisfy the requirements set in the bidding document. This includes all items specified under Section VI, Schedule of Requirements.
ITB 35.3(e)	To evaluate a Bid, the Purchaser shall consider only the criteria set out in Section III, Evaluation and Qualification Criteria.
ITB 35.6	Not applicable

ITB 37.2	The Purchaser is allowed to request the Bidder to submit additional documentary evidence of the Bidder's qualifications, but no amendment to the substance of the bid (as specified in ITB 32.2) or to the price can be accepted after the bid opening.
	F. Award of Contract
ITB 41	The Purchaser shall award the Contract to the Bidder whose Bid has been determined to offer the lowest evaluated price and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
ITB 47.2	**Procedure for the appeal from Bidders:** **Time limits and manner of submission of request for the protection of rights and with the instruction for fee payment** The procedure for the protection of rights is regulated by the provisions of Art. 186 - 234 of the Serbian Public Procurement Law ("Official Gazette of the RS", 91/2019; hereinafter: the Public Procurement Law), as well as by the Annex 8 PROCUREMENT COMPLAINTS PROCEDURES of the Guide to Procurement for projects financed by the EIB (September 2018). A request for the protection of rights may be submitted by bidder or interested person who has an interest to be awarded contract in this public procurement procedure and who has sustained or may sustain damage due to Purchaser's actions or by an error or irregularity during the award process. A request for the protection of rights is to be filed to the Purchaser and a copy is to be submitted to the Republic Commission for the Protection of Rights in Public Procurement Procedures, to address: Nemanjina 22-26, 11000 Beograd. The request for the protection of rights is submitted directly by e-mail to the e-mail: internationalpublicprocurement@mit.gov.rs or by registered post with a return receipt at the address: Ministry of Trade, Tourism and Telecommunications, Sector for European integrations and Project Management no.22-26 Nemanjina street, 11000 Belgrade, Republic of Serbia

Request for the protection of rights may be filed during the entire public procurement procedure, against any action of contracting authority, unless otherwise specified by the Public Procurement Law:

1. Request for the protection of rights challenging the type of procedure, the contents of the invitation to bid or of the bid documents, shall be considered timely if received by the Purchaser at latest three (3) days before the deadline for the submission of bids, regardless of the manner of delivery and if claimant has previously alerted the Purchaser to potential deficiencies and irregularities in compliance, but Purchaser failed to remedy those.

2. Request for the protection of rights challenging the actions of the Purchaser after the deadline for submission of bids, shall be considered timely if received by the Purchaser withing ten (10) from the day of receiving the Purchaser's decision that is challenged.

Possible deficiencies or irregularities of procurement documents cannot be the subject of complaint in the procedure of protection of rights unless those were previously indicated to the Purchaser in accordance with Article 97 of the Public Procurement Law.

After the deadline for submitting a request for protection of rights, the applicant may not supplement the request by stating the reasons in connection with the actions that are the subject of the dispute in the previously submitted request or by challenging others actions of the Purchaser with which he was or could have been acquainted before the expiration of the deadline for submitting the request for protection of rights, but which he did not point out in the submitted request.

Request for the protection of rights may not challenge activities of Purchaser performed in public procurement procedure if the claimant knew or could know the reasons for filing such request before the expiry of time limit for submission of request under point 1 and 2 of this Section, and the claimant did not submit it before the expiry of that time limit.

Where in the same public procurement procedure has already been filed another request for the protection of rights by the same claimant, the second request may not challenge the activities of Purchaser which the claimant knew or could know during the submission of the previous request.

Purchaser shall notify all the Bidders that purchased bid documents, that a request for the protection of rights was filled no later than two (2) days from the day of receiving request for the protection of rights.

Pursuant to the provisions of Article 216 of the Public Procurement Law, request for the protection of rights stops further activities of Purchaser in the procedure of public procurement until the resolution of the procedure for the protection of rights.

The request for protection of rights must contain all information specified in the Article 217 of the Public Procurement Law.

The Claimant is obliged to pay a fee on the account of the budget of the Republic of Serbia:

- 120.000 RSD if request for protection of rights disputes the type of procedure, the contents of the invitation to bid or of the bid documents, or other activities of the contracting authority taken before the expiry of the deadline for submitting of bids

- 0.1% of the estimated value of the public procurement, if that value is higher than 120,000,000 dinars, but no more than 1,200,000 RSD if request for protection of rights disputes the decisions and actions of the Purchaser after the deadline for submission of bids,

Instructions on payment of the fee for submitting a request for protection rights of the Republic Commission for the Protection of Rights in Public Procurement Procedures are published on the website of the Republic Commission: http://kjn.rs/en/instructions-for-fee-payment/http://kjn.rs/en/instructions-for-fee-payment/ .

For the Bidders from the Purchaser's country: The Claimant is obliged to pay the fee to the following account: Current account: 840-30678845-06, Model: 97, Call number: RFB reference number Recipient: Budget of the Republic of Serbia.

For the Bidders who have registered seat in another country: The Claimant is obliged to pay a fee on the account of the budget of the Republic of Serbia, in accordance to the instruction posted on the web site of the Republic Commission for the Protection of Rights in Public Procurement Procedures: http://kjn.rs/en/http://kjn.rs/en/, part "Instruction For Fee Payment", (http://kjn.rs/en/instructions-for-fee-paymenthttp://kjn.rs/en/instructions-for-fee-payment), part „Payment from abroad".

In case of the procedure for the protection of rights initiated by the Bidders who have registered seat in another country, all the documentation regarding the procedure for the protection of rights submitted by that Bidder, must be submitted with the translation into the Serbian language certified by the official court interpreter for the English language.

Pursuant to Article 217 of the Public Procurement Law, in case the procedure for the protection of rights is initiated by the Bidder who have registered seat in another country, the Bidder is obliged to appoint a proxy for receiving documents in the Republic of Serbia regarding the request for protection of rights, stating all the information necessary for communication with the aforementioned proxy.

Section III. Evaluation and Qualification Criteria

This Section complements the Instructions to Bidders. It contains the criteria that the Purchaser shall use to evaluate a bid and determine whether a Bidder has the required qualifications. No other criteria shall be used.

Contents

1. Evaluation Criteria (ITB 35.3 (e))

The Purchaser shall award the Contract to the Bidder whose Bid has been determined:
- to offer the **lowest evaluated price** and
- **is substantially responsive** to the Bidding Documents,
- provided further that the Bidder is **determined to be qualified** to perform the Contract satisfactorily.

The Bids will then be ranked from the lowest to the highest price. The lowest price is the most favourable.

In a situation where there are two or more equal lowest evaluated Bids, the Purchaser shall make selection based on following criteria:

- The Bidder with the greater aggregated total business revenue in the last three (3) accounting years (2019, 2020 and 2021) shall be awarded with the Contract.

  In case the proposal is submitted by a joint venture (consortium), the total business revenue of all the group members is considered cumulatively.

  Evidence: Financial statements or Balance sheets or BON JN (issued by the Serbian Business Registers Agency (SBRA) for a company established in the Purchaser's country).

2. Postqualification Requirements (ITB 37.2)

After determining the lowest evaluated bid in accordance with ITB Sub-Clause 36.1, the Purchaser shall carry out the post-qualification of the Bidder in accordance with ITB Clause 37, using only the requirements specified. Requirements not included in the text below shall not be used in the evaluation of the Bidder's qualifications. If it is stated that the post-qualifications provision "applies to each member in a joint venture/consortium", it means that the members cannot fulfil the requirement in a cumulative manner. If no such provision is stated, the requirement is fulfilled by all members of the joint venture (group of bidders) cumulatively (jointly).

Bidders must provide appropriate documentary evidence (documentary proofs), common under the law of the country in which they are established, attesting they fulfil the requested mandatory requirements. Date of the evidence submitted must not be older than 60 days before the bid submission date as per ITB 24.1. If there is any doubt about those facts, the Purchaser reserves the right to confirm with the competent authority.

Where the Bidder could not obtain requested documents within the deadline for submission of bids because, according to the regulations of its state of registration, the documents could not have been issued before the moment of bid submission, and if the Bidder provides appropriate evidence thereon together with the Bid, the Purchaser shall allow the Bidder to deliver the required documents later, within the subsequently set deadline.

Where state of Bidder's registration does not issue evidence required in accordance with this qualification requirements, instead of evidence the Bidder shall submit its written statement, subject to criminal and material liability and certified by the court, administrative body, public notary, or another competent body of that state.

(a)	**Legal Capability**

The Bidder will be excluded from participation in the procurement procedure if following exclusion criteria are met:

1. The Bidder is not registered with the competent body, or it is not entered in the appropriate register;
2. The Bidder fails to prove that it or its legal representative in the period of the previous five years up to the date of expiry of the time limit for submission of bidders has not been convicted by the final judgment, unless where different period of exclusion from the participation in the public procurement procedures has been set by the final judgment for:
   - the criminal offense he/she committed as a member of an organised criminal group and criminal offense of organising for the purpose of committing criminal offenses;
   - the criminal offense of abuse of the position of the responsible person, the criminal offense of misconduct in connection with public, the criminal offense of taking bribe in performing an economic activity, the criminal offense of giving bribe in performing an economic activity, the criminal offense of abuse of official position, the criminal offense of trafficking in influence, the criminal offense of accepting bribe and the criminal offense of bribery; the criminal offense of fraud, the criminal offense of obtaining and using the

loan and other benefits, the criminal offense of fraud in performing an economic activity and the criminal offense of tax evasion; the criminal offense of terrorism, criminal offense of public incitement to commit terrorist acts, the criminal offense of recruitment and training for the commission of terrorist acts and the criminal offense of terrorist association; the criminal offense of money laundering and the criminal offense of financing terrorism; the criminal offense of trafficking in human beings and the criminal offense of establishing a slavery relation and transportation of persons in slavery relation;

3. The Bidder fails to prove it has settled due taxes and contributions for compulsory social insurance or that the payment of debt has been postponed, in accordance with a special regulation, under a binding agreement or decision, including any interests accrued and fines;

4. It is determined that the Bidder has in the period of the previous two years up to the date of expiry of the deadline for submission of bids, violated applicable obligations in the area of the environmental protection, social and labour law, including collective agreements, and in particular the obligation to disburse the contracted wages, or other compulsory payments, including obligations in accordance with the provisions of the international conventions in the field of social and labour law and conventions on environmental protection;

5. It is determined that the Bidder has undertaken to unduly influence the decision-making process of the Purchaser or obtain confidential information that may confer upon it undue advantage in the public procurement procedure or to has provided misleading information that may have effect on decisions concerning the exclusion of Bidder, the selection of an Bidder or the award of a contract.

Documentary evidence:

The Bidder must provide evidence, common by the applicable law in countries in which they are established, not to fall into the above categories. Date of evidence submitted must not be older than **60 days** before the bid submission date.

The examples of documentary evidence are documents as listed below:

1) Excerpt from register of the relevant authority, which proves that Bidder is registered with the competent body, or entered in the appropriate register.*
2) Certificate of the competent authority (court or police) that Bidder and its legal representative(s) have not been convicted for any criminal offense listed above as exclusion criteria*
3) Certificate of the competent authority(ies) (e.g. Tax Administration and competent local self-government unit – Public Revenue Office) attesting that all mandatory taxes and contributions are paid.*
4) Written statement in accordance with the relevant exclusion criteria above, signed by the Bidder, subject to criminal and material liability and certified by the court, administrative body, public notary, or another competent body of that state.

5) Additionally, a Statement is given in the form Environmental and Social Covenant and should be completed by the bidder on the Bidder's memorandum and signed by its representative (in case of JV, signed by each JV member).

* Note: The Bidders registered in the Purchaser's country which are also registered in the Register of Bidders (whose functioning is entrusted to Serbian Business Register Agency), shall be considered to fulfil the abovementioned requirements 1), 2) and 3) and no additional documentary evidence besides the certificate of active status in the registry of Bidders should be submitted.

All abovementioned evidence may be submitted as uncertified copies. The Purchaser reserves the right to ask for the original evidence if deemed necessary.

In case the bid is submitted by a joint venture (group of bidders), this provision applies to each member of a joint venture (group of bidders).

(b)   Financial Capability

1) The average annual turnover of the Bidder must exceed 3.000.000 EUR for the period of last 3 (three) fiscal years.

In case the bid is submitted by a joint venture (group of bidders), the average annual turnover of all the group members is considered cumulatively.

Evidence: Audited or published closed financial statements for the last 3 (three) accounting years (2019, 2020 and 2021), e.g. Balance Sheet and Income statement, or Credit Report for public procurement needs issued by the Serbian Business Registers Agency, or Audit Report by the certified auditor etc.

2) The Bidder did not incur a loss in business (at the end of the fiscal year) in the last 3 (three) accounting years (2019, 2020 and 2021)

Evidence: Audited or published closed financial statements for the last three (3) accounting years (2018, 2019 and 2020), e.g. Balance Sheet and Income statement, Credit Report for public procurement needs issued by the Business Registers Agency, Audit Report by the certified auditor etc.
In case the bid is submitted by a joint venture (group of bidders) this provision applies to each member of a joint venture (group of bidders)**.**

3) The Bidder was not insolvent in the last 6 months before the date of publication of the Invitation to Bid.

Evidence: A certificate from the competent authority (the body that keeps a register of companies, central bank or the commercial bank of the Bidder) issued after the publication date of the Invitation to Bid.

In case the bid is submitted by a joint venture (group of bidders) this provision applies to each member of a joint venture (group of bidders)**.**

(c)	Business Capability

The Bidder shall furnish documentary evidence to demonstrate that it meets the following experience requirements:

1) **The Bidder has in the past 3 (three) years prior to the deadline for the submission of Bids, successfully supplied and delivered of similar Data Center equipment and Software Infrastructure licenses in the total value of at least 5.000.000,00 EUR, under no more than 2 (two) contracts out of which at least one has over 2.500.000,00 EUR value.**

Successfully supplied and delivered means that the supply and delivery obligations agreed in a contract, in terms of the quality and quantity of goods supplied, were fulfilled.

Similar Data Center equipment and Software Infrastructure licenses means data center servers, storage systems and virtualization software.

All goods supply and delivery that was provided as part of a framework contract (but multiple individual contracts) will be considered as one contract.

Evidence: List of reference contracts (projects) and Certificate signed by the Contracting Authority or the Beneficiary[2] or other relevant documentary proofs stating the name of the Bidder and the client, required completion date, type and quantity (e.g. acceptance letters). If document other than certificate signed by the Contracting Authority or the Beneficiary is submitted, the Bidder shall provide a proof a copy proof of payment with delivery notes as a successful completion evidence.

In case the bid is submitted by a joint venture (group of bidders), the requirement is fulfilled by all members of the group members cumulatively. This means that one or more members have executed one or more contracts with specified characteristics, but at least 1 (one) such contract in total.

(d)	Personnel Capability

1) **The Bidder must have employed or otherwise engaged with the Bidder on the day of bid the following personnel:**

  a. **at least 1 (one) employed certified Project Manager (Prince2Practitioner Certificate or PMP or equivalent)**

  b. **at least 2 (two) competent engineers certified by the manufacturer for the offered private cloud solution,**

---

[2] *The Beneficiary, in this instance, means the legal entity that benefits from the terms of a contract made between the Bidder and the Contractor/Contracting Authority (e.g. receives the goods or services).*

  c. **at least 2 (two) competent engineers certified by the manufacturer for the offered data centres virtualization,**

  d. **at least 2 (two) competent engineers certified by the manufacturer for the offered network virtualization.**

Note: One engineer may hold more than one required certificate or another relevant proof, and in that way, fulfil the above requirements.

Evidence:

- Statement on the engaged personnel
- Copies of appropriate proof on working engagement (for The Bidders registered in the Purchaser's country, excerpt issued electronically by the competent Central Register of Compulsory Social Insurance or photocopies of contracts with engaged persons);
- Copies of valid certificates or another relevant proof (issued by the manufacturer of the offered equipment and software).

In case the bid is submitted by a joint venture (group of bidders), the requirement is fulfilled by all members of the group members cumulatively.

(e)	Certifications, standards and licences

The Bidder must conduct its business operations in accordance with the relevant standards, namely:

a) ISO 9001:2015 or equivalent - the quality management system standard[3]
b) ISO 27001:2013 or equivalent - the information security management system standard[4]
c) ISO 20000-1:2018 or equivalent- the IT service management system standard[5]

In case the bid is submitted by a joint venture (group of bidders), the requirements a) and b) must be fulfilled by each members of the group, while requirement c) must be fulfilled by the member(s) in charge of performing the installation work**.**

Documentary evidence: Photocopy of valid certificates.

(f)	Technical Capability

1) The Bidder is authorized by the manufacturer (or the registered representative office of the manufacturer for the Republic of Serbia) of the offered Data Center equipment and supporting software licences to sell the offered equipment and licences in the territory of the

---

[3] https://www.iso.org/standard/62085.html
[4] https://www.iso.org/standard/54534.html
[5] https://www.iso.org/standard/70636.html

Republic of Serbia. This requirement applies to all equipment (items no. 1-12 listed in the Price Schedule Form)

Evidence: Manufacturer's sales authorization (the completed form "Manufacturer's Authorization" as set forth in the bid documents or similar form containing the same information).

In case the bid is submitted by a joint venture (group of bidders), the requirement is fulfilled by all members of the group members cumulatively.

The Purchaser reserves the right to check the contents of the submitted documentary evidence and/or request additional documents at the stage of postqualification of Bids, in accordance with ITB 37. If it is established that the information provided on the confirmation provided is incorrect in the sense that false information has been provided, such Bid will be rejected as inadmissible.

At the same time, the Purchaser indicates that the submission of false information constitutes an offense of the bidder under the provisions of the Public Procurement Law of the Republic of Serbia and a criminal offense under the provisions of the Criminal Code of the Republic of Serbia.

CHANGES

The Bidder is obliged to inform the Purchaser without delay of any change regarding the fulfilment of the conditions of this procurement procedure, which occurs until the decision, i.e. conclusion of the Contract, or during the validity of the Contract.

Section IV. Bidding Forms

Table of Forms

Bidder Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted. In case the Bid is submitted by the JV this form is filled in by the JV Lead member and the next form is submitted by each member of the JV. All italicized text is to help Bidders in preparing this form and should be deleted after completing the form]

Date: *[insert date (as day, month and year) of Bid Submission*]

RFP No: EIB-GtP/ 337-00-77/2023-06

1. Bidder's Legal Name *[insert Bidder's legal name]*
2. In case of JV, legal name of each party: *[insert legal name of each party in JV]*
3. Bidder's actual or intended Country of Registration: *[insert actual or intended Country of Registration]*
4. Bidder's Year of Registration: *[insert Bidder's year of registration]*
5. Bidder's Legal Address in Country of Registration: *[insert Bidder's legal address in country of registration]*
6. Bidder's Authorized Representative Information - person duly authorized to sign on behalf of the Bidder Name: *[insert Authorized Representative's name]* Address: *[insert Authorized Representative's Address]* Telephone/Fax numbers: *[insert Authorized Representative's telephone/fax numbers]* Email Address: *[insert Authorized Representative's email address]*
7. Bidder's contact person for this Bid – to be used for communication per ITB 29.3: Name: *[insert contact persons' name]* Address: *[insert contact persons' address]* Telephone/Fax numbers: *[insert contact persons' telephone/fax numbers]* Email Address: *[insert contact persons' email address]*

8. Bidder's annual turnover for the last 3 accounting years*:*
   2019: _____ EUR
   2020: _____ EUR
   2021: _____ EUR

   Average annual turnover for years 2019, 2020, 2021: _____ EUR

9. Attached are copies of original documents of: *[check the box(es) of the attached original documents]*

☐ Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2.

☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB Sub-Clause 4.1.

☐ In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB Sub-Clause 4.5 and establishing that the Bidder is not under the supervision of the Purchaser.

☐ The list of affiliated legal entities and a list of Board of Directors.

Joint Venture Partner Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. The following table shall be filled in for each member of a Joint Venture. All italicized text is to help Bidders in preparing this form and should be deleted after completing the form].

Date: *[insert date (as day, month and year) of Bid Submission]*
RFP No: EIB-GtP/ 337-00-77/2023-06

1. Bidder's Legal Name: *[insert Bidder's legal name]*
2. JV's Party legal name: *[insert JV's Party legal name]*
3. JV's Party Country of Registration: *[insert JV's Party country of registration]*
4. JV's Party Year of Registration: *[insert JV's Part year of registration]*
5. JV's Party Legal Address in Country of Registration: *[insert JV's Party legal address in country of registration]*
6. JV's Party Authorized Representative Information Name: *[insert name of JV's Party authorized representative]* Address: *[insert address of JV's Party authorized representative]* Telephone/Fax numbers: *[insert telephone/fax numbers of JV's Party authorized representative]* Email Address: *[insert email address of JV's Party authorized representative]*
7. JV Member's annual turnover for the last 3 accounting years: 2019: _____ EUR 2020: _____ EUR 2021: _____ EUR Average annual turnover for years 2019, 2020, 2021: _____ EUR
8. Attached are copies of original documents of: *[check the box(es) of the attached original documents]* ☐ Articles of Incorporation or Registration of firm named in 2, above, in accordance with ITB Sub-Clauses 4.1 and 4.2.

☐ In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB Sub-Clause 4.5 and establishing that the Bidder is not under the supervision of the Purchaser.

☐ The list of affiliated legal entities and a list of Board of Directors.

Bid Submission Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted. All italicized text is to help Bidders in preparing this form and should be deleted after completing the form]

Date: *[insert date (as day, month and year) of Bid Submission]*
EIB-GtP/ 337-00-77/2023-06

To: **Ministry of Information and Telecommunications No.22- 26 Nemanjina street, 11000 Belgrade, Republic of Serbia**

We, the undersigned, are submitting our Bid for "**Expansion of AMRES data center virtualization and school network monitoring capacities**", EIB-GtP/ 337-00-77/2023-06 in accordance to your Request for Bids dated *[insert date]. {If the Bidder is a joint venture, insert the following: We are submitting our Bid a joint venture with: {Insert a list with full name and the legal address of each member, and indicate the lead member}. We have attached a copy {insert: "of our letter of intent to form a joint venture" or, if a JV is already formed, "of the JV agreement"} signed by every participating member, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture}.*

We hereby declare that:

(a) We have examined and have no reservations to the Bidding Documents, including all Addendum(s)*;*

(b) We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedule specified in the Schedule of Requirements the following Goods and Related Services: all goods and services for the whole contract.

(c) If our bid is accepted and we are awarded with a Contract, the Goods and Related Services that we may supply under the Contract, shall be sourced from an eligible country in accordance with **ITB 5** and Section V, Eligible Countries. The Goods and Related Services shall be sourced from [*insert name of the country(ies)*].

The total price of our Bid quoted per instructions in **ITB 14**, excluding any discounts offered in item (e) below is:

_____ EUR *[insert the total price of the Bid in words and figures]*

(d) The unconditional discounts offered are: *[Specify in detail each unconditional discount offered.]*
The exact method of calculations to determine the net price after application of unconditional discounts is shown below: [*Specify in detail the method that shall be used to apply the discounts*];

(e) Our bid shall be valid for the period of time specified in ITB Sub-Clause 20.1, from the date fixed for the bid submission deadline in accordance with ITB Sub-Clause 24.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security in accordance with **ITB** Clause 46 and **GCC** Clause 17 for the due performance of the Contract;

(g) We meet the eligibility requirements and have no conflict of interest in accordance with **ITB** Sub-Clause 4.2;

(h) We are not submitting any other Bid(s) as an individual Bidder, and we are not participating in any other Bid(s) as a Joint Venture member, or as a subcontractor, and meet the requirements of **ITB 4.3**; Suspension and Debarment:

(i) We declare and covenant that neither we nor anyone, including any of our directors, employees, agents, joint venture partners or sub-contractors, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, (i) is listed or otherwise subject to EU/UN Sanctions and (ii) in connection with the execution or supply of any works, goods or services for the Contract, will act in contravention of EU/UN Sanction.

(j) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption[6].

(k) *[select the appropriate option and delete the other] [We are not a state-owned enterprise or institution] / [We are a state-owned enterprise or institution but meet the requirements of **ITB 4.6**].*

(l) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(m) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

Name of the Bidder: *[insert complete name of the Bidder]*

Signed:_____ *[insert signature of person whose name and capacity are shown]*
In the capacity of _____*[insert legal capacity of person signing the Bid Submission Form]*

 Name:_____ *[insert complete name of person signing the Bid Submission Form]*

Duly authorized to sign the bid for and on behalf of:_____ *[insert complete name of Bidder]*

---
[6] https://www.eib.org/en/publications/anti-fraud-policy

Notes:
* *In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder.*
** *In the case of the Bid submitted by a Joint Venture the person signing the Bid shall have the power of attorney given by the members of Joint Venture. The power of attorney shall be attached with the Bid Submission Form.*

Price Schedule Form

[The Bidder shall fill in this Price Schedule Form in accordance with the instructions indicated. The list of line items in column 1 of the ***Price Schedule*** *shall coincide with the List of Goods, Licences and Related Services specified by the Purchaser in the Schedule of Requirements.]*

No.	SPECIFICATION OF EQUIPMENT AND RELATED LICENSES TO BE DELIVERED Item description	Unit of measure	Quantity	Currency (EUR)	Unit DDP price*	Total DDP price*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Virtualization server for management cluster	Pcs	4	EUR		
2	Virtualization server for workload cluster	Pcs	16	EUR		
3	Backup server	Pcs	1	EUR		
4	FC SAN switch	Pcs	2	EUR		
5	Primary Storage	Pcs	1	EUR		
6	Backup Storage	Pcs	1	EUR		
7	Cloud virtualization software for management domain	Pcs	8	EUR		

8	Cloud virtualization software for workload domain (non HCI, external storage)	Pcs	10	EUR		
9	Central virtualization console	Pcs	2	EUR		
10	Software for Backup & Replication (package for 200 instances)	Pcs	1	EUR		
11	Upgrade of an existing storage solution	Pcs	1	EUR		
12	Upgrade of the system for automated monitoring analytics and reporting of AMRES School and IP/MPLS network	Pcs	1	EUR		
13	Installation and Commissioning	Pcs	1	EUR		
TOTAL Bid Price:				**EUR**		

Date_____   Signature of the Bidder's authorized person _____

Instructions for the Bidders how to complete the Price Schedules:

- Currency given in the Price Schedule Form will be used as Contract currency
- The Bidder fills in the column *Unit DDP (Delivered Duty Paid) price* in the column (6) per following instructions:
  - **For goods:** *Unit DDP (Delivered Duty Paid) price* including the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination. Please note

that the project is exempt of all customs duties and value added tax (VAT) as per BDS 14.3 and those shall not be included.

- o **For related services**: Unit price for services (without import duties if applicable), without value added tax (VAT).

- The Bidder fills in the column *Total DDP price* in the column (7) per following instructions:
  - o As a product of column (4) Qunatity and column (6) *Total DDP price*, formula (7)=(4)x(6)

Bid Security (Bank Guarantee)

[The Bank shall fill in this Bank Guarantee Form in accordance with the instructions indicated.]

_____
[Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: _____ *[Name and Address of Purchaser]*

Date: _____

BID GUARANTEE No.:   _____

We have been informed that *[name of the Bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of *[name of contract]* under Request for Bids No. *[RFB number]* ("the RFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *[name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[amount in figures]* (*[amount in words]*) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

(b) having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity, (i) fails or refuses to execute the Contract Form; or (ii) fails or refuses to furnish the performance security, if required, in accordance with the Instructions to Bidders.

This guarantee will expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) twenty-eight days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

_____
[signature(s)]

Manufacturer's Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.]

Date: *[insert date]*

RFB name:

Expansion of AMRES data center virtualization and school network monitoring capacities, EIB-GtP/ 337-00-77/2023-06

To: **Ministry of Information and Telecommunications, No. 22- 26 Nemanjina street, 11000 Belgrade, The Republic of Serbia**

WHEREAS

We *[insert complete name of Manufacturer],* who are official manufacturers of *[insert type of goods manufactured],* having factories at [*insert full address of Manufacturer's factories*], do hereby authorize *[insert complete name of Bidder]* to submit a bid the purpose of which is to provide the following Goods, manufactured by us *[insert name and/or brief description of the Goods],* and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 27 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the Manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the Manufacturer]*

Title: *[insert title]*

Duly authorized to sign this Authorization on behalf of: *[insert complete name of Manufacturer]*

Covenant of Integrity

Procurement Reference No: **EIB-GtP/ 337-00-77/2023-06**

To: **Ministry of Information and Telecommunications No. 22- 26, Nemanjina street, 11000 Belgrade, The Republic of Serbia**

We declare and covenant that neither we nor anyone, including any of our directors, employees, agents, joint venture partners or sub-contractors, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, has engaged, or will engage, in any Prohibited Conduct (as defined below) in connection with the biding process or in the execution or supply of any works, goods or services for Contract Agreement "**Expansion of AMRES data center virtualization and school network monitoring capacities**" (the "**Contract**") and covenant to so inform you if any instance of any such Prohibited Conduct shall come to the attention of any person in our organisation having responsibility for ensuring compliance with this Covenant.

We shall, for the duration of the bid process and, if we are successful in our bid, for the duration of the Contract, appoint and maintain in office an officer, who shall be a person reasonably satisfactory to you and to whom you shall have full and immediate access, having the duty, and the necessary powers, to ensure compliance with this Covenant.

We declare and covenant that neither we nor anyone, including any of our directors, employees, agents, joint venture partners or sub-contractors, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, (i) is listed or otherwise subject to EU/UN Sanctions and (ii) in connection with the execution or supply of any works, goods or services for the Contract, will act in contravention of EU/UN Sanctions.

We covenant to so inform you if any instance shall come to the attention of any person in our organisation having responsibility for ensuring compliance with this Covenant.

If (i) we have been, or any such director, employee, agent or joint venture partner, where this exists, acting as aforesaid has been, convicted in any court or sanctioned by any authority of any offence involving a Prohibited Conduct in connection with any tendering process or provision of works, goods or services during the five years immediately preceding the date of this Covenant, or (ii) any such director, employee, agent or a representative of a joint venture partner, where this exists, has been dismissed or has resigned from any employment on the grounds of being implicated in any Prohibited Conduct, or (iii) we have been, or any of our directors, employees, agents or joint venture partners, where these exist, acting as aforesaid has been excluded or otherwise sanctioned by the EU Institutions or any major Multi-lateral Development Bank (including World Bank Group, African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank or Inter-American Development Bank) from participation in a tendering procedure on the grounds of Prohibited Conduct, we give details of that

conviction, dismissal or resignation, or exclusion below, together with details of the measures that we have taken, or shall take, to ensure that neither this company nor any of our directors, employees or agents commits any Prohibited Conduct in connection with the Contract [*give details if necessary*].

We acknowledge that if we are subject to an exclusion decision by the European Investment Bank (EIB), we will not be eligible to be awarded a contract to be financed by the EIB.

We grant the Ministry of Information and Telecommunications, Republic of Serbia, the European Investment Bank and auditors appointed by either of them, as well as any authority or European Union institution or body having competence under European Union law, the right to inspect and copy our books and records and those of all our sub-contractors under the Contract. We accept to preserve these books and records generally in accordance with applicable law but in any case for at least six years from the date of tender submission and in the event we are awarded the Contract, at least six years from the date of substantial performance of the Contract.

For the purpose of this Covenant, Prohibited Conduct has the meaning provided in the EIB's Anti-Fraud Policy[7].

Signed:_____ *[insert signature of person whose name and capacity are shown]*

Name:_____ *[insert complete name of person signing the Bid Submission Form]*

In the capacity of _____*[insert legal capacity of person signing the Bid Submission Form]*

Duly authorized to sign the bid for and on behalf of:_____ *[insert complete name of Bidder or JV member/lead]*

Dated on _____ *[insert date of signing]*

---

[7] EIB's Anti-Fraud Policy for definitions (http://www.eib.org/infocentre/publications/all/anti-fraud-policy.htm)

Environmental and Social Covenant

Procurement Reference No: **EIB-GtP/ 337-00-77/2023-06**

To: **Ministry of Information and Telecommunications, No. 22- 26, Nemanjina street, 11000 Belgrade, The Republic of Serbia**

We, the undersigned, commit to comply with – and ensuring that all of our sub-contractors comply with – all labour laws and regulations applicable in the country of implementation of the contract, as well as all national legislation and regulations and any obligation in the relevant international conventions and multilateral agreements on environment applicable in the country of implementation of the contract.

Labour standards. We further commit to the principles of the eight Core ILO standards[8] pertaining to: child labour, forced labour, non-discrimination and freedom of association and the right to collective bargaining. We will (i) pay rates of wages and benefits and observe conditions of work (including hours of work and days of rest) which are not lower than those established for the trade or industry where the work is carried out; and (ii) keep complete and accurate records of employment of workers at the site.

Workers relations. We therefore commit to developing and implementing a Human Resources Policy and Procedures applicable to all workers employed for the project in line with Standard 8 of the EIB's Environmental and Social Handbook. We will regularly monitor and report on its application to [*insert name of the Contracting Authority*] as well as on any corrective measures periodically deemed necessary.

Occupational and Public Health, Safety and Security. We commit to (i) complying with all applicable health and safety at work laws in the country of implementation of the contract; (ii) developing and implementing the necessary health and safety management plans and systems, in accordance with the measures defined in the Project's Environmental and Social Management Plan (ESMP) and the ILO Guidelines on occupational safety and management systems[9]; (iii) providing workers employed for the project access to adequate, safe and hygienic facilities as well as living quarters in line with the provisions of Standard 9 of the EIB's Environmental and Social Handbook for workers living on-site; and (iv) using security management arrangements that are consistent

---

[8] http://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang--en/index.htm
[9] http://www.ilo.org/safework/info/standards-and-instruments/WCMS_107727/lang--en/index.htm

with international human rights standards and principles, if such arrangements are required for the project.

Protection of the Environment. We commit to taking all reasonable steps to protect the environment on and off the site and to limit the nuisance to people and property resulting from pollution, noise, traffic and other outcomes of the operations. To this end, emissions, surface discharges and effluent from our activities will comply with the limits, specifications or stipulations as defined in *[insert name of the relevant document]*[10] and the international and national legislation and regulations applicable in the country of implementation of the contract.

Environmental and social performance. We commit to (i) submitting [*insert periodicity as indicated in the tender documents*] environmental and social monitoring reports to [*insert name of the Contracting Authority*]; and (ii) complying with the measures assigned to us as set forth in the environmental permits [*insert name of the relevant document if applicable*][11] and any corrective or preventative actions set forth in the annual environmental and social monitoring report. To this end, we will develop and implement an Environmental and Social Management System commensurate to the size and complexity of the Contract and provide [*insert name of the Contracting Authority*] with the details of the (i) plans and procedures, (ii) roles and responsibilities and (iii) relevant monitoring and review reports.

We hereby declare that our tender price as offered for this contract includes all costs related to our environmental and social performance obligations as part of this contract. We commit to (i) reassessing, in consultation with *[insert name of the Contracting Authority],* any changes to the project design that may potentially cause negative environmental or social impacts; (ii) providing *[insert name of the Contracting Authority]* with a written notice and in a timely manner of any unanticipated environmental or social risks or impacts that arise during the execution of the contract and the implementation of the project previously not taken into account; and (iii) in consultation with *[insert name of the Contracting Authority],* adjusting environmental and social monitoring and mitigation measures as necessary to assure compliance with our environmental and social obligations.

Environmental and social staff. We shall facilitate the contracting authority's ongoing monitoring and supervision of our compliance with the environmental and social obligations described above. For this purpose, we shall appoint and maintain in office until the completion of the contract an Environmental and Social Management Team (scaled to the size and complexity of the Contract) that shall be reasonably satisfactory to the Contracting Authority and to whom the Contracting Authority shall have full and immediate access, having the duty and the necessary powers to ensure compliance with this Environmental and Social Covenant.

---

[10] For instance: ESIA (Environmental and Social Impact Assessment) and ESMP (Environmental and Social Management Plans).
[11] For instance: ESIA (Environmental and Social Impact Assessment) and ESMP (Environmental and Social Management Plans).

We accord the Contracting Authority and the EIB and auditors appointed by either of them, the right of inspection of all our accounts, records, electronic data and documents related to the environmental and social aspects of the current contract, as well as all those of our sub-contractors.

Signed:_____ *[insert signature of person whose name and capacity are shown]*

Name:_____ *[insert complete name of person signing the Bid Submission Form]*

In the capacity of _____*[insert legal capacity of person signing the Bid Submission Form]*

Duly authorized to sign the bid for and on behalf of:_____ *[insert complete name of Bidder or JV]*

Dated on _____ *[insert date of signing]*

Section V. Eligible Countries

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement

In accordance with EIB Guide to Procurement – "firms originating from all countries of the world are eligible to tender for works, goods and services contracts".

The Bank shall not provide or otherwise make funds available, directly or indirectly, to or for the benefit of an individual or entity that is subject to financial sanctions imposed by the EU, either autonomously or pursuant to the financial sanctions decided by the United Nations Security Council on the basis of Article 41 of the UN Charter.

In addition, individuals or firms may not be eligible to tender in application of ITB 3.1 Section I.

PART 2 – Supply Requirements

Section VI. Schedule of Requirements

Contents

1. Introduction

Academic and Research Network of Republic of Serbia (AMRES) is a science-exploration and education computer network of the Republic of Serbia and connects more than 2,000 education and research institutions in Republic of Serbia including practically all primary and secondary school locations in the country.

As part of the further development of the AMRES Infrastructure, AMRES plans the transition to the Software Defined Data Center architecture (SDDC).

This project for upgrades of the academic data network aims to accelerate the journey to the Software Defined Data Center architecture (SDDC) by acquiring a private cloud platform that will be used to create and deliver all various services for their user.

2. Related Services and Completion Schedule

Completion schedule

Implementation period will commence on July 2023, upon written notification issued by the Client. The project implementation period is 210 calendar days in total.
The realization of the project is divided into two phases:
Phase 1: The delivery of the Data Center equipment and Licenses
Phase 2: Installation and commissioning, which means all defined activities necessary for commissioning the equipment, which includes installation, initialization, and necessary testing

The supplier shall deliver the equipment and the licenses within 120 calendar days from Commencement date, which will be validated with the Quantitative acceptance document signed by representatives of the Supplier and Beneficiary.

The equipment will be delivered to the delivery address specified by the Beneficiary.

The supplier shall perform the installation and initialization within 90 calendar days from the date of Quantitative acceptance.
Performed services will be confirmed by a signed Qualitative acceptance document signed by the representatives of the Supplier and Beneficiary.

Project activities

After the contract signing, the Bidder is obliged to perform the following activities:

- Assign the person who is responsible for the contract implementation (Bidder's project manager)
- To provide LLD (Low Level Design) documentation (electronic form and in hard copy)
- Deliver equipment (Phase 1), including a delivery note
- Install, configure, and implement the whole solution in the Data Center of the Beneficiary (Phase 2), including Qualitative Acceptance Certificate
- Provide support and warranty during the warranty period. Minimum period of Manufacturer's warranty for all system components is specified in Technical Specification Form. Maximum period for repair and replacement from the moment of declaring – 30 (thirty) days <u>unless</u> otherwise is specified in Technical Specification Form.
- Training: Yes (see details in Technical Specification)

The Beneficiary has the following obligations:
- To assign the responsible person for project implementation
- To prepare the location of the final destination for delivery, if needed
- To obtain all approvals, if necessary, for location access

3. Technical Specifications

Technical requirements for Data Center equipment and Licenses

Complete solution should deliver a comprehensive, integrated product and lifecycle management solution for whole environment, which will help administrators to speed up deployments and updates, optimize and automate ongoing product and content management, and apply Day 0 to Day 2 operational best practices across all components of provided solution. It should also enable easy rollback with the simplified upgrade and patching process with an environment snapshot function, including automated management of certificates, licenses, users, passwords and configurations.

The cloud solution should meet all points listed hereby. In order to provide simplified management and single point of contact for the support, it is required that offered cloud software solution is from the single vendor.

Software for backup and replication must cover 200 virtual machines (instances).

Existing storage Huawei Dorado 5000v6 must be upgraded with additional capacity.

.

All goods and materials to be incorporated in the goods must be new, unused, and of the most recent or current models (models which have not reached their end-of-sales), and shall incorporate all recent improvements in design and materials, unless provided otherwise in the contract.

The Technical Specifications and Technical Specification Form for all the items are integral part of this procurement.

All pages of the **Technical Specification Form** where entries or amendments have been made shall be initialled by the person or persons signing the bid.

The bidders are requested to complete Technical Specification Form with a description of the offered items.

Column Unit of measure and Indicative amount are completed by the Purchaser (not to be modified by the Bidder).

Column Country of Origin should be filled in by the Bidder with the country of origin for the items offered.

Column Technical Specification Offered should be filled in by the Bidder with technical specification offered.

Column Other information allows the bidder to make references to the technical documentation (data sheet, catalogue, brochure or other technical documentation).

3. TECHNICAL SPECIFICATION FORM

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
1. Virtualization server for management cluster					
Processor Minimum 2 processors installed. CISC x86 processor, minimum 16 physical cores, minimum base frequency 2.9 GHz, minimum 24 MB cache for each processor. Memory support minimum DDR4 – 3200 Mhz Minimum 64x PCIe 4.0 lanes per CPU **Motherboard** Intel C621A chipset or equivalent with support for the processor with the technical characteristics above. **Memory** 512 GB RAM type DDR4-3200 Mhz installed (minimum 32 GB dual rank x16 modules) Minimum 8 memory channels per processor Support for ECC, SDDC, ADDDC and memory mirroring	Pcs	4			

It supports a minimum of 32 memory modules with the possibility of increasing the capacity up to a minimum of 4TB Supports RDIMM and 3DS RDIMM modules The memories must have a unique programmed signature that allows the server to check if the memory is qualified and supported. The server must support persistent memory technology, at least 16x Intel Optane Persistent Memory 200 Series modules (8 per processor) to increase application performance. **Internal storage capacity installed.** At least 2 M.2 SATA storage units with a capacity of at least 480 GB each, in hardware RAID 1 configuration Caching drives: Minimum 2x SATA 6 Gbps hot-swap SSD Capacity drives: Minimum 4x SAS 12 Gbps hot-swap SSD **Internal storage capacity supported** Support for at least 20 3.5" disks or 40 2.5" SAS/SATA disks with hot-swap capabilities, depending on the installed backplane. **HDD Controller**					

It offers a minimum of 8 SAS/SATA 12Gbps ports
SAS/SATA drive support
PCIe 4.0 x8 host interface
Supports installation of self-encrypting drives: Software based SED support (SED commands are passed through the HBA to the drives)
Support for mixing SAS and SATA storage units (HDD and SSD)
Optimized for SSD performance
Support for 512e, 512n and 4K sector formatted drives
S.M.A.R.T. support
Compliant with Disk Data Format (DDF) configuration on disk (CoD).

Video interface
Integrated on the motherboard, min. 16 MB of dedicated RAM, which can support a minimum resolution of 1920x1200 at 60 Hz with 32 bits per pixel

Network interfaces
at least 2 Ethernet ports 2x 10/25Gb SFP28 populated with 2x 10Gb SFP+ transceivers and 2x 10/25Gb SFP28 populated with 2x 25GBase-SR SFP28 Transceiver

I/O slots

Possibility of upgrading to at least 8 PCIe 4.0 slots
Dedicated slot for OCP adapter with PCIe 4.0 x16 interface
 	
Ports
At least 5x USB 3.1 G1 (5 Gb/s), one of which is internal
At least 1x USB 2.0 for accessing the management interface
Minimum 1 VGA ports with the possibility of upgrading to 2 VGA ports
At least 1 GbE 10/100/1000 Mbps RJ-45 port dedicated for system administration
At least 1 M.2 connector to support the installation of two SSDs with hardware RAID-1 support.
 	
Management
Server must have following software features:
    •Management of power consumption and temperature at DataCenter level.
    •Visual control of the Rack layout via 2D thermal map.
    •Optimize power usage through cooling analysis, low usage analysis, server power characteristics and workload placement analysis.
Built-in system monitoring system with out-of-band management mode with all					

| functionalities activated and unlimited in time. Provides system information gathering capabilities, system status monitoring, alerting and notification, network settings configuration, security settings configuration, system firmware update, real-time power consumption monitoring, activation key management, capture and playback of video images when the system starts and/or crashes. It offers capabilities for remote access to the system (from another system), remote installation of the operating system, displaying historical or real-time graphs of energy consumption and temperature. It also offers capabilities for mapping image files (ISO) from a remote system, mounting image files via HTTPS/SFTP/CIFS and NFS protocols. It allows at least 5 users to work collaboratively in the console with the possibility of using a virtual chat The management system will have support for the web interface with HTML5 support (without requiring Java or ActiveX installation) as well as for CLi. System management can also be done through a mobile application through an iOS/Android mobile device that can be connected both to the USB 2.0 port | | | | | |

located on the front of the server and through the network.
The management system must ensure remote administration and through standard interfaces in the industry:
      - IPMI v2.0
      - SNMP v3
      - CIM
      - DCMI v1.5
      - REST
 	
Convergent Management Application
    The system will be delivered with a centralized management software at the level of the infrastructure of processing nodes, developed by the server manufacturer, which will allow functionalities to discover the managed elements and their inventory, their monitoring, firmware updates, compliance checks at the level of firmware managed elements, management of inventory equipment configurations, installation of operating systems and the hypervisor of virtualization systems directly on inventory servers from the administration console. The solution will allow you to visually display the items in the inventory. The solution allows you to inventory all the equipment offered (servers, switches and storage equipment) in the form of dashboards. The solution					

must allow the management and administration of inventory elements without installing agents (agentless). The connection between the management platform and the equipment under management must be secure (SSL). Equipment management must be unitary and integrated at the level of the solution that allows the definition of profiles that can be associated with the equipment in the inventory and applied to them. At the level of the management solution, granular information must be available on the server equipment under management (processor configuration, memory, IO interfaces) as well as the level of firmware running on them and the operating system. The management solution must have integration functionalities in orchestration platforms through the REST API (open standard). Within the platform, there should be a possibility of using a PowerShell-type interface to allow the running of scripts. It must also allow integration connectors with virtualization platform management solutions (VMware and Microsoft). The proposed solution must have authentication mechanisms that allow connection to an external LDAP/Active Directory server. The solution must have visual methods of displaying the energy consumption of the server machines in					

the inventory. The offered nodes must be compatible and certified for the offered management software solution and allow all its management functionalities. In order to allow a convergent management of the processing and storage infrastructure, the management application must integrate with the storage solution, allowing discovery, inventory, monitoring of the hardware resources of the offered storage equipment and alerting related to operational problems.
 	
Case
     Rackmountable 19", maximum 2U, rack mounting kit included, with support for wiring arm and support for securing access to disks with key panel.
 	
Security
     The server must include the Trusted Platform Module (TPM) 2.0 security module
 	
Fans
     At least 6 (six) 60 mm hot swap fans, redundant, variable rotation speed
 	
Electrical power sources
     At least 2 1800W sources, Platinum efficiency class, redundant, hot swap,					

with C13-C14 power cables of at least 1m.
 	
Operating system compatibility
    The server must be compatible with at least the following operating systems (supported and certified):
        VMware ESXi 7.0 U2
        VMware ESXi 7.0 U3
        VMware ESXi 8.0
 	
Certification
    CE, EN55032 Class A, EN62368-1, EN55024, EN55035, EN61000-3-2, EN61000-3-3, (EU) 2019/424 and EN50581, Energy Star 3.0
 	
Warranty and support
    3 years with response the next working day and fixing defects at the customer's premises.					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
2. Virtualization server for workload cluster					

Processor
     Minimum 2 Intel Xeon 4th Gen processors or equivalent installed. CISC x86 processor, minimum 32 physical cores, minimum base frequency 2.2 GHz, minimum 60 MB cache for each processor. Memory support minimum DDR5 – 4800 Mhz Minimum 80x PCIe 5.0 lanes per CPU
 	
 Motherboard
     Intel C741 "Emmitsburg" chipset or equivalent with support for the processor with the technical characteristics above.
 	
 Memory
     1536 GB RAM type DDR5-4800 Mhz installed (minimum 64 GB dual rank x4 modules) Minimum 8 memory channels per processor Support for ECC, SDDC, ADDDC and memory mirroring It supports a minimum of 32 memory modules with the possibility of increasing the capacity up to a minimum of 8TB
	Pcs	**16**			

Supports RDIMM and 3DS RDIMM modules The memories must have a unique programmed signature that allows the server to check if the memory is qualified and supported. **Internal storage capacity installed.** At least 2 M.2 SATA storage units with a capacity of at least 240 GB each, in hardware RAID 1 configuration **Internal storage capacity supported** Support for at least 20 3.5" disks or 40 2.5" SAS/SATA disks with hot-swap capabilities, depending on the installed backplane. Support for installing a minimum of 2 M.2 or 7mm drives for OS installation. Support for installing SAS, SATA or U.2/U.3 NVME disks in the same case Support for minimum 1.2PB total capacity with using 2.5" drives. **HDD Controller RAID intern** HW RAID adapter with RAID levels 0/1/10/5/50 **Video interface** Integrated on the motherboard, min. 16 MB of dedicated RAM, which can support a minimum resolution of					

Page 83 of 305

1920x1200 at 60 Hz with 32 bits per pixel
 	
Network interfaces
    at least 2 Ethernet ports 2x 10/25Gb SFP28 populated with 2x 10Gb SFP+ transceivers and 2x 10/25Gb SFP28 populated with 2x 25GBase-SR SFP28 Transceiver
    at least 2* 32Gb 2-port Fiber channel adapters
 	
I/O slots
    Possibility of upgrading to at least 12 PCIe slots
    10 rear PCIe 5.0 slots + one networking dedicated OCP slot and 2 front PCIe slots
    Dedicated slot for OCP adapter with PCIe 5.0 x16 interface
    The server must support the installation of at least 8x single-wide GPUs or 3x double-wide GPUs through subsequent upgrades.
 	
Ports
    At least 5x USB 3.2 G1 (5 Gb/s), one of which is internal
    At least 1x USB 2.0 for accessing the management interface
    Minimum 1 VGA ports with the possibility of upgrading to 2 VGA ports
    At least 1 GbE 10/100/1000 Mbps RJ-45 port dedicated for system administration					

At least 1 M.2 connector to support the installation of two SSDs or NVMes in an M.2 module with RAID-1 support. Ability to install DB-9 COM serial port. **Management** 　Server must have following software features: 　　•Management of power consumption and temperature at DataCenter level. 　　•Visual control of the Rack layout via 2D thermal map. 　　•Optimize power usage through cooling analysis, low usage analysis, server power characteristics and workload placement analysis. 　Built-in system monitoring system with out-of-band management mode with all functionalities activated and unlimited in time. 　It should provide system information gathering capabilities, system status monitoring, alerting and notification, network settings configuration, security settings configuration, system firmware update, real-time power consumption monitoring, activation key management, capture and playback of video images when the system starts and/or crashes. 　It should offer capabilities for remote access to the system (from another				

system), remote installation of the operating system, displaying historical or real-time graphs of energy consumption and temperature.
It should also offer capabilities for mapping image files (ISO) from a remote system, mounting image files via HTTPS/SFTP/CIFS and NFS protocols.
It should allow at least 5 users to work collaboratively in the console with the possibility of using a virtual chat
The management system will have support for the web interface with HTML5 support (without requiring Java or ActiveX installation) as well as for CLi.
System management can also be done through a mobile application through an iOS/Android mobile device that can be connected both to the USB 2.0 port located on the front of the server and through the network.
The management system must ensure remote administration and through standard interfaces in the industry:
     - IPMI v2.0
     - SNMP v3
     - CIM
     - DCMI v1.5
     - REST					

Convergent Management Application The system should be delivered with a centralized management software at the level of the infrastructure of processing nodes, developed by the server manufacturer, which will allow functionalities to discover the managed elements and their inventory, their monitoring, firmware updates, compliance checks at the level of firmware managed elements, management of inventory equipment configurations, installation of operating systems and the hypervisor of virtualization systems directly on inventory servers from the administration console. The solution shall allow users to visually display the items in the inventory. The solution shall allow to inventory all the equipment offered (servers, switches and storage equipment) in the form of dashboards. The solution must allow the management and administration of inventory elements without installing agents (agentless). The connection between the management platform and the equipment under management must be secure (SSL). Equipment management must be unitary and integrated at the level of the solution that allows the definition of profiles that can be associated with the equipment in the inventory and applied to them. At the					

level of the management solution, granular information must be available on the server equipment under management (processor configuration, memory, IO interfaces) as well as the level of firmware running on them and the operating system. The management solution must have integration functionalities in orchestration platforms through the REST API (open standard). Within the platform, there should be a possibility of using a PowerShell-type interface to allow the running of scripts. It must also allow integration connectors with virtualization platform management solutions (VMware and Microsoft). The proposed solution must have authentication mechanisms that allow connection to an external LDAP/Active Directory server. The solution must have visual methods of displaying the energy consumption of the server machines in the inventory. The offered nodes must be compatible and certified for the offered management software solution and allow all its management functionalities. In order to allow a convergent management of the processing and storage infrastructure, the management application must integrate with the storage solution, allowing discovery, inventory, monitoring of the hardware resources of the offered storage					

equipment and alerting related to operational problems. **Case** 　　Rackmountable 19", maximum 2U, rack mounting kit included, with support for wiring arm and support for securing access to disks with key panel. **Security** 　　The server must include the Trusted Platform Module (TPM) 2.0 security module **Fans** 　　At least 6 (six) 60 mm hot swap fans, redundant, variable rotation speed **Electrical power sources** 　　At least 2 1800W sources, Platinum efficiency class, redundant, hot swap, with C13-C14 power cables of at least 1m. **Operating system compatibility** 　　The server must be compatible with at least the following operating systems (supported and certified): 　　Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi					

Certification
    CE, EN55032 Class A, EN62368-1, EN55024, EN55035, EN61000-3-2, EN61000-3-3, (EU) 2019/424 and EN50581, Energy Star 3.0
 	
Warranty and support
    3 years with response the next working day and fixing defects at the customer's premises.					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
3. Backup server					

Processor
    Minimum 2 Intel Xeon 4th Gen processors or equivalent installed. CISC x86 processor, minimum 16 physical cores, minimum base frequency 2.0 GHz, minimum 30 MB cache for each processor.
    Memory support minimum DDR5 – 4800 Mhz
    The server must support the installation of at least 2 processors with 60 cores each and TDP 350W
    Minimum 80x PCIe 5.0 lanes per CPU
	Pcs	**1**			

Motherboard

   Intel C741 "Emmitsburg" chipset or equivalent with support for the processor with the technical characteristics above.

Memory

   64 GB RAM type DDR5-4800 Mhz installed (minimum 2 x 32GB 1Rx4 modules)
   Minimum 8 memory channels per processor
   Support for ECC, SDDC, ADDDC and memory mirroring
   It should support a minimum of 32 memory modules with the possibility of increasing the capacity up to a minimum of 8TB
   Supports RDIMM and 3DS RDIMM modules
   The memories must have a unique programmed signature that allows the server to check if the memory is qualified and supported..

Internal storage capacity installed.

   At least 2 Read Intensive SATA SSD units with a capacity of at least 480 GB each

Internal storage capacity supported

Support for at least 20 3.5" disks or 40 2.5" SAS/SATA disks with hot-swap capabilities, depending on the installed backplane.

Support for installing a minimum of 2 M.2 or 7mm drives for OS installation.

Support for installing SAS, SATA or U.2/U.3 NVME disks in the same case

Support for minimum 368.64TB total capacity with using 2.5" drives.

HDD Controller RAID intern

It offers a minimum of 8 SAS/SATA 12Gbps ports

RAID controller with support for RAID 0, 1, 10. Support for JBOD.

PCIe 4.0 x8 12 Gbps SAS RAID controller

Supports installation of self-encrypting disks

Support for mixing SAS and SATA storage units (HDD and SSD)

Support for 512e, 512n and 4K sector formatted drives

Support for up to 32 virtual drives

S.M.A.R.T. support

Support for TRIM and UNMAP

Compliant with Disk Data Format (DDF) configuration on disk (CoD).

Online Capacity Expansion

Online RAID Level Migration

Hardware Secure Boot

Video interface

Integrated on the motherboard, min. 16 MB of dedicated RAM, which can support a minimum resolution of 1920x1200 at 60 Hz with 32 bits per pixel

Network interfaces

at least 2 Ethernet ports 2 x 10/25Gb SFP28 populated with 2 x 10Gb SFP+ transceivers and 2 x 10/25Gb SFP28 populated with 2 x 25GBase-SR SFP28 Transceiver
at least 32Gb 2-port Fiber channel adapters

I/O slots

Possibility of upgrading to at least 5PCIe slots
3 rear PCIe 5.0 slots + one networking dedicated OCP slot and 2 front PCIe slots
Dedicated slot for OCP adapter with PCIe 5.0 x16 interface
The server must support the installation of at least 3x single-wide GPU.

Ports

At least 4x USB 3.2 G1 (5 Gb/s), one of which is internal

At least 1x USB 2.0 for accessing the management interface
Minimum 1 VGA ports with the possibility of upgrading to 2 VGA ports
At least 1 GbE 10/100/1000 Mbps RJ-45 port dedicated for system administration
At least 1 M.2 connector to support the installation of two SSDs or NVMes in an M.2 module with RAID-1 support.
Ability to install DB-9 COM serial port.
 	
Management
Server must have following software features:
    •Management of power consumption and temperature at DataCenter level.
    •Visual control of the Rack layout via 2D thermal map.
    •Optimize power usage through cooling analysis, low usage analysis, server power characteristics and workload placement analysis.
Built-in system monitoring system with out-of-band management mode with all functionalities activated and unlimited in time.					

It should provide system information gathering capabilities, system status monitoring, alerting and notification, network settings configuration, security settings configuration, system firmware update, real-time power consumption monitoring, activation key management, capture and playback of video images when the system starts and/or crashes.

It should offer capabilities for remote access to the system (from another system), remote installation of the operating system, displaying historical or real-time graphs of energy consumption and temperature.

It should also offer capabilities for mapping image files (ISO) from a remote system, mounting image files via HTTPS/SFTP/CIFS and NFS protocols.

It should allow at least 5 users to work collaboratively in the console with the possibility of using a virtual chat

The management system should have support for the web interface with HTML5 support (without requiring Java or ActiveX installation) as well as for CLi.

System management can also be done through a mobile application through an iOS/Android mobile device that can be connected both to the USB 2.0

port located on the front of the server and through the network.

The management system must ensure remote administration and through standard interfaces in the industry:
- IPMI v2.0
- SNMP v3
- CIM
- DCMI v1.5
- REST

Convergent Management Application

The system shall be delivered with a centralized management software at the level of the infrastructure of processing nodes, developed by the server manufacturer, which will allow functionalities to discover the managed elements and their inventory, their monitoring, firmware updates, compliance checks at the level of firmware managed elements, management of inventory equipment configurations, installation of operating systems and the hypervisor of virtualization systems directly on inventory servers from the administration console. The solution should allow users to visually display the items in the inventory. The solution should allow users to inventory all the equipment offered (servers, switches and storage

equipment) in the form of dashboards. The solution must allow the management and administration of inventory elements without installing agents (agentless). The connection between the management platform and the equipment under management must be secure (SSL). Equipment management must be unitary and integrated at the level of the solution that allows the definition of profiles that can be associated with the equipment in the inventory and applied to them. At the level of the management solution, granular information must be available on the server equipment under management (processor configuration, memory, IO interfaces) as well as the level of firmware running on them and the operating system. The management solution must have integration functionalities in orchestration platforms through the REST API (open standard). Within the platform, users should have the possibility of using a PowerShell-type interface to allow the running of scripts. It must also allow integration connectors with virtualization platform management solutions (VMware and Microsoft). The proposed solution must have authentication mechanisms that allow

connection to an external LDAP/Active Directory server. The solution must have visual methods of displaying the energy consumption of the server machines in the inventory. The offered nodes must be compatible and certified for the offered management software solution and allow all its management functionalities. In order to allow a convergent management of the processing and storage infrastructure, the management application must integrate with the storage solution, allowing discovery, inventory, monitoring of the hardware resources of the offered storage equipment and alerting related to operational problems. **Case** Rackmountable 19", maximum 1U, rack mounting kit included, with support for wiring arm and support for securing access to disks with key panel. **Security** The server must include the Trusted Platform Module (TPM) 2.0 security module					

Fans
    At least 6 (six) 60 mm hot swap fans, redundant, variable rotation speed
 	
Electrical power sources
    At least 2 1100W sources, Platinum efficiency class, redundant, hot swap, with C13-C14 power cables of at least 1m.
 	
Operating system compatibility
    The server must be compatible with at least the following operating systems (supported and certified):
    Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi
 	
Certification
    CE, EN55032 Class A, EN62368-1, EN55024, EN55035, EN61000-3-2, EN61000-3-3, (EU) 2019/424 and EN50581, Energy Star 3.0
 	
Warranty and support
    3 years with response the next working day and fixing defects at the customer's premises.					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
4 FC SAN Switch					
Form factor Standalone or 1U rack mount **Ports** 48x SFP+ physical ports (32Gb), <u>**all port covered with licenses and 32Gb transceivers**</u> 4x QSFP+ physical ports **Media types** • 128 Gb (4x 32 Gb) FC QSFP+: short wavelength (SWL), long wavelength (LWL) • 4x 16 Gb FC QSFP+: SWL • 32 Gb FC SFP+: SWL, LWL, extended long wavelength (ELWL) • 16 Gb FC SFP+: SWL, LWL, extended long wavelength (ELWL) • 10 Gb FC SFP+: SWL, LWL **Port speeds** • 128 Gb (4x 32 Gb) FC SWL QSFP+: 128 Gbps, 4x 32 Gbps, or 4x 16 Gbps • 128 Gb (4x 32 Gb) FC LWL QSFP+: 128 Gbps or 4x 32 Gbps fixed • 4x 16 Gb FC QSFP+: 4x 16/8/4 Gbps auto-sensing	Pcs	2			

• 32 Gb FC SFP+: 32/16/8 Gbps auto-sensing
• 16 Gb FC SFP+: 16/8/4 Gbps auto-sensing
• 10 Gb FC SFP+: 10 Gbps fixed
 	
FC port types
    • Full Fabric mode: F_Port, M_Port (Mirror Port), E_Port, EX_Port (Requires an optional Integrated Routing License), D_Port (Diagnostic Port)
    • Access Gateway mode: F_Port and NPIV-enabled N_Port
 	
Standard features
    Full Fabric mode, Access Gateway, Advanced Zoning, Fabric Services, 10 Gb FC, Adaptive Networking, Advanced Diagnostic Tools, Virtual Fabrics, In-flight Compression, In-flight Encryption
 	
Optional features
    Enterprise Bundle (ISL Trunking, Fabric Vision, Extended Fabric) or Mainframe Enterprise Bundle (ISL Trunking, Fabric Vision, Extended Fabric, FICON CUP), Integrated Routing					

Performance Non-blocking architecture with wire-speed forwarding of traffic: • 4GFC: 4.25 Gbit/sec line speed, full duplex • 8GFC: 8.5 Gbit/sec line speed, full duplex • 10GFC: 10.51875 Gbit/sec line speed, full duplex • 16GFC: 14.025 Gbit/sec line speed, full duplex • 32GFC: 28.05 Gbit/sec line speed, full duplex • 128GFCp: 4x 28.05 Gbit/sec line speed, full duplex • Aggregated throughput: 2 Tbps • Latency for locally switched ports is < 780 ns (including FEC); compression is 1 µs per node **Scalability** • Maximum number of switches in the fabric: 239 • Maximum frame size: 2,112-byte payload • Maximum number of frame buffers per switch: 15,360 • Maximum number of ports per ISL trunk: 8x SFP+ or 2x QSFP+ (Up to 256 Gbps; ISL Trunking license is included in the Enterprise or Mainframe Enterprise bundle)					

Cooling Three fans built into each power supply; N+N cooling redundancy with two power supplies. **<u>Non-port to port side airflow</u>**. **Power supply** Two redundant hot-swap 250 W AC (100 - 240 V) power supplies (IEC 320-C14 connector). **Management ports** One 10/100/1000 Mb Ethernet port (UTP, RJ-45); one RS-232 port; one USB port (for additional firmware/log/configuration files storage). **Management interfaces** Web-based GUI (Web Tools); Command Line Interface (CLI); SMI-S; SNMP; REST API. Optional Brocade SANnav Management Portal and SANnav Global View. **Security features** Secure Socket Layer (SSL); Secure Shell (SSH); Secure Copy (SCP); Secure FTP (SFTP); user level security, Role-based Access Control (RBAC); LDAP, RADIUS, and TACACS+ authentication; access control lists (ACLs)					

Hardware warranty and support 3 years, Next-business-day onsite response during normal business hours (9-17h), 5 days per week, as well as 24x7 call center for support ticket admission purpose.				

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
5. Primary storage					

General storage (disk array) requirements
    • The disk array should be factory new, not refurbished, unused and purchased through an official channel
    • The disk array must be among the leading providers according to the Gartner Magic Quadrant for 2022 (October 2022 Magic Quadrant for Primary Storage Arrays),
    • The disk array should support at least the following operating systems:
        - Microsoft Windows Server,
        - Microsoft Hyper-V,
        - VMware vSphere,
        - Red Hat Enterprise Linux,
    • Operation should be based on the principle of "no single point of failure" and duplicated active field components (fans, power supplies,
	Pcs	1			

controllers, etc.), automatic switching is supported in case of component failure. Power supplies and fans should be Hot-Swap replaceable, • In the event of failure of individual disk capacity, sufficient disk space should be available for the need to restore data. • Possibility of installing up to 64 Fiber Channel ports (32 Gb/s on each port supporting FC and NVMe over FC) or installing up to 32 iSCSI ports (10 Gb/s on each port), • It should support NMVe SSD, SAS SSD, SAS 10k and NL-SAS drives, the total disk array should support 96 NVMe drives or 864 SAS drives. • Support for continuous access to replicated data between geographically separated systems, without the need for user intervention (active-active) and without the use of additional hardware and software components for achieving zero RPO/RTO • Supported RAID levels: 1, 5 and 6 • The controllers should have a total of at least 1024 GB of cache (read and write). The cache is equally distributed between the two controllers, • ability to transfer unwritten data from the cache ("cache") to the built-					

in media in the event of a power failure. • Possibility to create partitions with dedicated resources like cache and drives. • The controllers must operate in symmetric "active/active" mode with load distribution between the two controllers. • Remote monitoring of the status is possible, control, management and configuration of all required functionalities are enabled via the graphical interface, command line interface and API. • The ability to support external virtualization of third-party disk systems without additional external components. Storage must support virtualization over FC and iSCSI ports. Storage must support same features for virtualised volumes as for internal capacity, and possibility to migrate data between arrays online. • Ability to upgrade to future storage generation without downtime. • Ability to provide scale out with maximum of 65 controllers nodes per cluster. • the ability to monitor via the SNMP protocol and alert via e-mail and must have call home function,				

• The ability to expand storage pools and logical disks without interrupting operation. • The ability to migrate LUNs online both between the same and different disk groups, RAID levels or disk pools without interrupting operation and ability to do online of virtualized storage. • The ability of deduplication or data compression, compression should have specialized hardware to offload the task from central controller. • Support hardware encryption • Quality of Service for ability to limit throughput/bandwidth per LUN, WWN, server or storage port. QoS should be schedulable. • The ability to upgrade disk array firmware without any downtime during working hours • The ability to replace defective ones and add new disks without downtime, • everything necessary to install the disk array enclosure in a standard 19-inch rack enclosure, • Storage integration with Openstack, Containers, VMware (vRealize, SRM, VAAI, VASA, vCenter integration), Microsoft SCOM, Oracle, and others					

Offered disk array should contain (minimum) • 16 x Fiber Channel ports (32 Gb/s on each port), • **1024 GB total cache** (for reading and writing) • **NVMe SSD drives in RAID 6 (14+2) with 15TB drives**. **Including hot-spare disks**, which the provider offers according to the manufacturer's recommendations and the optimal configuration of the disk system offered. **Total number of RAID group should be 1, minimum 240TB RAW in total**. • License for virtualizing offered backup storage and ability to create clones from production storage to backup storage. • "Thin provisioning" license for offered capacity of the disk array • A license to create data images and clones (snapshot/clone) fand ransomware protection to enable protected volumes (Write protection and volume reconfiguration protection for all management users) • A license for deduplication or data compression, • A license to limit the maximum throughput or bandwidth utilization per LUN, WWN, Host group or storage port ("QoS") • License for historical and live performance monitoring and reporting				

for entire data path which allows you to monitor storage, SAN switches, servers (OS/Hypervisors) with ability to automatically determine cause of performance issues • License for dynamic migration of logical disks between RAID groups or storage pools without downtime for offered capacity. • License for synchronous and asynchronous and replication and for active-active setup (Metro Cluster) • All necessary licenses for connecting any number of servers with specified operating systems to the disk array, • Software for storage management automation using predefined templates to lower consumed time for storage management. Automation should support automating on SAN and OS level and be able to integrate with 3rd party tools using APIs and scripting. • The storage system must support virtualization of third-party external storage system by simply connecting (without adding external devices). Storage virtualization must enable every virtualization scenario: taking external LUNs into a pool, being able to merge LUNs from multiple storages into one pool, using existing LUNs with associated data. Practically all functionalities that can be used on the				

| offered storage must also be possible in the virtualization of external storage, including replication.
• Must have an "object storage" license from same manufacturer for at least 10TB of offered capacity. In object store, it is necessary to ensure the storage of immutable objects with meta data, their lock/worm functionality - changing the object/file creates a new version of the same administration with multiple users (minimum 100 tenants). Each tenant must support the development of several different policies for data storage (retention period, versioning, shredding, access rights...), i.e. it must support at least 10,000 name-spaces with different policies, Cloud connection with MS Azure, Amazon S3 , Google Cloud Platform or any cloud with supported S3 protocol. The system must support tiering between different forms of data storage and have the ability to migrate data and metadata (e.g. external physical capacity to Amazon S3). Additional 10TB licenses on Cloud space (S3) have to be offered.

Warranty and support
    3 year warranty for whole system must
    be included. | | | | |

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
6. Backup storage					

General storage (disk array) requirements
• The disk array should be factory new, not refurbished, unused and purchased through an official channel
• The disk array must be among the leading providers according to the Gartner Magic Quadrant for 2022 (October 2022 Magic Quadrant for Primary Storage Arrays),
• The disk array should support at least the following operating systems:
    - Microsoft Windows Server,
    - Microsoft Hyper-V,
    - VMware vSphere,
    - Red Hat Enterprise Linux,
• operation should be based on the principle of "no single point of failure" and duplicated active field components (fans, power supplies, controllers, etc.), automatic switching is supported in case of component failure. Power supplies and fans should be Hot-Swap replaceable,
• in the event of failure of individual disk capacity, sufficient disk space should be available for the need to restore data.
	Pcs	1			

• Ability to provide scale out with maximum of 65 controllers nodes per cluster. • Possibility of installing up to 16 Fiber Channel ports (32 Gb/s on each port, FC) or installing up to 8 iSCSI ports (10 Gb/s on each port), • it should support NMVe SSD, SAS SSD, SAS 10k and NL-SAS drives, the total disk array should support 24 NVMe drives and 240 SAS SSD drives or up to 480 SAS/NL_SAS drives. • Support for continuous access to replicated data between geographically separated systems, without the need for user intervention (active-active) and without the use of additional hardware components for achieving zero RPO/RTO • Supported RAID levels: 1, 5 and 6 • the controllers should have a total of at least 768 GB of cache (read and write). The cache is equally distributed between the two controllers, • ability to transfer unwritten data from the cache ("cache") to the built-in media in the event of a power failure, • Possibility to create partitions with dedicated resources like cache and drives.				

• The controllers must operate in symmetric "active/active" mode with load distribution between the two controllers. • remote monitoring of the status is possible, control, management and configuration of all required functionalities are enabled via the graphical interface, command line interface and API. • the offered disk array must support possibility to migrate data from the existing to the new disk array without interruption of operation (online), • The ability to support external virtualization of third-party disk systems without additional external components. Storage must support virtualization over FC and iSCSI ports. Storage must support same features for virtualised volumes as for internal capacity. • the ability to monitor via the SNMP protocol and alert via e-mail and must have call home function, • the ability to expand disk groups, logical disks and configured RAID levels without interrupting operation, • the ability to migrate LUNs online both between the same and different disk groups, RAID levels or disk pools without interrupting operation and					

ability to do online of virtualized storage.
• the ability of deduplication or data compression.
• Support hardware encryption
• Quality of Service for ability to limit throughput/bandwidth per LUN, WWN, server or storage port. QoS should be schedulable.
• ability to upgrade disk array firmware without any downtime during working hours
• The ability to replace defective ones and add new disks without downtime,
• everything necessary to install the disk array enclosure in a standard 19-inch rack enclosure,
• Storage integration with Openstack, Containers, VMware (vRealize, SRM, VAAI, VASA, vCenter integration), Microsoft SCOM, Oracle, and others

Offered disk array should contain (minimum)
• 8 x Fiber Channel ports (32 Gb/s on each port),
• **768 GB total cache** (for reading and writing)
• **NL-SAS drives in RAID 6 (12+2) with 14TB drives**. **Including hot-spare disks**, which the provider offers according to the manufacturer's recommendations and the optimal

configuration of the disk system offered. **Total number of RAID group should be 4, minimum 784 TB RAW in total**. • "thin provisioning" license for offered capacity of the disk array • a license to create data images and clones (snapshot/clone) fand ransomware protection to enable protected volumes (Write protection and volume reconfiguration protection for all management users) • a license for deduplication or data compression, • a license to limit the maximum throughput or bandwidth utilization per LUN, WWN, Host group or storage port ("QoS") • license for historical and live performance monitoring and reporting for entire data path which allows you to monitor storage, SAN switches, servers (OS/Hypervisors) with ability to automatically determine cause of performance issues • license for dynamic migration of logical disks between RAID groups or storage pools without downtime for offered capacity. • License for synchronous and asynchronous and replication and for active-active setup (Metro Cluster				

• all necessary licenses for connecting any number of servers with specified operating systems to the disk array, • Software for storage management automation using predefined templates to lower consumed time for storage management. Automation should support automating on SAN and OS level and be able to integrate with 3rd party tools using APIs and scripting. • The storage system must support virtualization of third-party external storage system by simply connecting (without adding external devices). Storage virtualization must enable every virtualization scenario: taking external LUNs into a pool, being able to merge LUNs from multiple storages into one pool, using existing LUNs with associated data. Practically all functionalities that can be used on the offered storage must also be possible in the virtualization of external storage, including replication. **Warranty and support** 3 year warranty for whole system must be included.					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
7. Cloud virtualization software for management domain					
Virtualization Hypervisor ● Virtualization software shall provide a virtualization layer that sits directly on the bare metal server hardware with no dependence on a general-purpose OS for greater reliability and security. ● Virtualization software shall have the capability to create Virtual machines with up to 768 virtual processors and 24 TB virtual RAM in virtual machines for all the guest operating system supported by the hypervisor. ● Virtualization software should support live migration of virtual machines with no disruption to users or loss of service, eliminating the need to schedule application downtime for planned server maintenance. ● Virtualization software should perform live migration of virtual machines files from one storage array to another without any Virtual Machine downtime. It should support this migration from one	Pcs	8			

storage protocol to another (ex. FC, iSCSI, NFS, DAS). ● Virtualization software should support 4k native storage. ● Virtualization software should provide efficient, array-agnostic replication of virtual machine data over the LAN or WAN, and simplifies management by enabling replication at the virtual machine level. ● During the update process of the hypervisor, solution should provide an option to skip hardware initialization steps, and reboot only running hypervisor components. ● Virtualization software shall have High Availability capabilities for the virtual machines in the sense, if in case one server fails all the Virtual machines running on that server shall be automatically restarted to another physical server running same virtualization software. The feature should be independent of Guest Operating System Clustering and should work with FC/ iSCSI SAN and NAS shared storage ● Virtualization software should provide zero downtime, zero data loss and continuous availability for the applications running in virtual machines in the event of physical					

host failure, without the cost and complexity of traditional hardware or software clustering solutions. This option should be supported for up to 8 virtual CPUs per virtual machine with up to 128 GB RAM. ● The solution should provide option for securing virtual machines with offloaded antivirus and antimalware solutions without the need for agents inside the virtual machine with integration with 3rd party Anti-Virus/Anti-Malware solutions ● The solution should provide secure access and account management through identity federation with ADFS. ● The solution should support for increasing capacity by adding CPU, Memory or any other devices to virtual machines on an as needed basis without any disruption in working or downtime for supported operating systems ● Virtualization software should support automated load balancing of workload across the resources allocated to workloads in a cluster. ● Virtualization software should support prioritization of storage and network access by continuously monitoring I/O load of a storage volume and over the network, and				

dynamically allocating available I/O resources to virtual machines according to business needs. ● Virtualization software should be able to receive server health information and migrate virtual machines from degraded hosts before problems occur. ● Virtualization software should support TPM 2.0 hardware modules and option to adds a virtual TPM device to shield guest OS from Operator or in-guest attacks. ● Solution should automate the bring-up process of the entire software platform, including deployment of infrastructure VMs, creation of the management cluster, configuration of VLANs, storage, physical network, and cluster creation and provisioning, but also enable a simplified patching/upgrading process of the software platform. ● Licensing should be based on per-CPU licensing model. **Hyperconverged Infrastructure** ● Hyper-Converged Infrastructure storage virtualization needs to be embedded into the offered hypervisor and be enabled without				

any additional virtual machine or virtual appliance.
- Provide central cluster-aware storage for virtual hosts.
- Storage policy-based management which allows common management across storage tiers and dynamic storage class-of-service automation via a policy-driven control plane.
- Distributed data protection using RAID-1 and RAID-5/6 erasure coding.
- Provide virtual distributed switch, which is used with the offered hypervisor.
- Support for a variety of Fault Tolerance options based on virtual machine requirements.
- Virtual storage snapshots & clones.
- Rack awareness.
- All-Flash storage support.
- Deduplication & Compression.
- Block Access for external hosts (iSCSI).
- Built in health check and performance functions for ease of management.
- Not to be hardware vendor specific, and to enable usage of various server vendors, such are HPE, Dell, Cisco, Intel, Supermicro, Fujitsu, Hitachi and Lenovo.

● Should support live-migration and high-availability for virtual machines ● Support for data-at-rest and data-in-transit encryption. ● Support for stretch cluster configuration and setup. ● Support for file services. ● Support for Quality of Service and setting of IOPS limits ● Provide Container Storage Interface (CSI) driver ● Licensing should be based on per-CPU licensing model. **Virtualization and security platform for the virtual environment and SDDC** Beside virtualization hypervisor and HCI solution, it is required to enable network services across the virtualized environment and SDDC, with additional security functionalities which will provide valid security for the SDDC and workload which will use its resources, across the sites. It is required to offer solution which will provide: ● Solution must be independent of the hardware used and must allow the creation of a complete network model within the software, with the possibility of creating a simple network topology, all the way to a					

complex multi-tier network topology.
- Solution must support VMware vSphere and KVM hypervisor, integration with VMware vCenter, as well as Multi-vCenter environments and federation.
- Solution must enable "distributed switching" functionality.
- Solution must enable "distributed routing", with support for multi-tier routing, dynamic routing with ECMP, as well as virtual routing and packet forwarding. The solution must support static routing for IPv4 and IPv6, BGP for IPv4 and IPv6 Unicast, HA VIP, route redistribution, active/active and active/stand-by redundancy.
- Support for EVPN.
- Support for NAT - source and destination NAT, stateless NAT, NAT logging and NAT64.
- Support for DHCP - IP blocks, subnets, pools, IPv4 and IPv6 DHCP Server / Relay.
- DNS support - IPv4 DNS relay / DNS proxy.
- Support for VPN, L2 and L3.
- Solution must have an integrated distributed firewall that operates at the vNIC level of each virtual machine. The defined rights must

be valid even when the virtual machine changes the server where it is located.
- Distributed firewall must support the following:
  - Creating statefull L2 and L3 policies
  - Creating stateless L2 and L3 policies
  - Creating tag-based policies, where the tag can be defined at the level of different objects, network or workload objects, IP or MAC addresses.
- Basic L7 application identification rules.
- Support for Distributed Flood Protection.
- Support for Distributed Identity Firewall using Guest Introspection and using Active Directory Event Server.
- Support for Distributed Endpoint Protection and Distributed Network Introspection.
- Solution must support "bridging" functionality between the virtual and physical environment, ie. to enable communication between virtual machines connected to a virtualized switch and physical machines connected to physical switches (L2 bridging).

● Solution must enable load balancing functionality with server health checks, for traffic management and manipulation purposes. Minimum support for the following features: ○ Load Balancing: UDP, TCP (L4-L7), HTTP ○ Supported algorithms: Round Robin, Source IP hash, least connection. ○ Health Checks: TCP, ICMP, UDP, HTTP, HTTPs ● Solution must enable the creation of network services for the needs of container and Kubernetes environments and applications, as well as enable communication between services, ie. container-based applications and services located on virtual machines. ● Support for automation and use of API for integration with other solutions: ○ REST API ○ JSON ○ Java SDK ○ Phyton SDK ○ Terraform ○ Ansible ● Solution must have advanced tools for network monitoring and management:					

o   Tunnel Health Monitoring
o   TraceFlow
o   Port Mirroring
o   Port Connectivity Tool
o   Packet Capture
● Solution must have a platform for collecting and intelligent analysis of different types of logs related to the solution, and to enable easy search of collected logs, monitoring and assistance in solving problems, analysis of flows and generated alerts.
● Solution must provide layer 4 VM-to-VM traffic flow analysis, layer 4 automated security policy creation and network traffic analytics.
● Solution must provide separate GUI which will enable advanced network monitoring options, including:
  o   Support for virtual flows (VDS IPFIX, V2V, V2P)
  o   Firewall network segmentation planning and operations.
  o   Visibility across third-party switches, routers, firewalls and load balancers, including public cloud environments such are AWS and Azure.
  o Network device auto discovery.					

- o Flow/threshold analytics and reporting. - o Physical flows (NetFlow v7 and v9, and sFlow) - o Visibility for Kubernetes traffic - o Network and security analytics (top talkers, anomalies, outlier detection, etc.). - o Flow-based application discovery (powered by machine learning) - o Support for Cisco Application Centric Infrastructure (ACI), Cisco BGP-EVPN and Arista BGP-EVPN underlay/overlay visibility, Juniper Ethernet VPN VM-to-VM path. - Solution must enable secure authentication and authorization of users, with integration with Active Directory, support for authentication through OpenLDAP, creation of conditional access policies and Role Based Access Control. - Licensing should be based on per-CPU licensing model **Solution for monitoring, capacity planning and troubleshooting** Building SDDC with different hardware and software components					

requires possibility to have detailed overview of whole solution, utilization of all resources with option to plan and estimate capacity utilization and single view for troubleshooting. Complete solution must enable simple and intelligent monitoring of the performance and utilization of the entire virtual infrastructure. Accordingly, the solution must enable the following: ● Highly available scale-out platform with configurable reviews and reports. ● Visualization: Out-of-the-Box Dashboards, Views, Reports, Heat Map, Performance Charts. ● Possibility of creating flexible operational policies and operational groups ● Defining users and assigning appropriate rights to users (Role-based access control) ● The solution should have self-learning analytics to define and monitor system performance, as well as the ability to dynamically define limits. ● Real-Time Predictive Capacity Management, Including Trending, Metering, Rightsizing, Optimization.				

● Intelligent and advanced alert management (alerts), in such a way that instead of generating more alerts, only one is generated that directly points to the root cause of the problem, while generating recommendations on how to solve and overcome the reported problem. ● Monitoring of spent capacity, and trends related to growth or reduced capacity consumption (capacity model-driven analytics), analysis of the correct definition of the capacity of individual services (to avoid oversizing or under-sizing of the same) and optimization of the same. ● Creating what-if analysis and reports, in order to provide a simple insight into how certain changes and activities affect the entire system (analysis that should show the impact of adding or subtracting certain HW resources, the impact of adding a new workload, related assessments for service migration between data centers, or between public cloud environments). ● Monitoring the utilization of resources, their planning and optimization, regardless of the type				

of object being observed, including data from third systems. ● Solution should discover services running in each VM and then build a relationship or dependencies between services from different VMs based on the network communication. It should create dynamic applications based on the network communication between the services. ● Monitoring OS resources - CPU, disk, memory and network. ● Physical OS Monitoring. ● Integration with the offered server virtualization platform and hyperconverged platform, as well as with the log monitoring and analysis platform. ● Ability to use additional management packages that allow monitoring of various hardware components, such as storage and network devices, as well as management packages for monitoring Kubernetes environment, which can be on-premises or within public cloud services. ● Application Performance Management Tool Integration (AppDynamics, Datadog, Dynatrace, New Relic).				

● It is necessary to provide a simple insight into the total costs of the complete SDDC system, as well as a clear understanding of how and in what way the available resources are spent. The solution should enable:
  ○ Automatic data collection and cost analysis covering the entire SDDC environment.
  ○ Easy overview and comparison of costs and costs of certain services if they are created within a private or public cloud environment.
  ○ Identifying and improving resource utilization based on received cost reports.
● Licensing should be based on per-CPU licensing model.-
 	
Modern infrastructure automation platform
  It is required to provide a modern infrastructure automation platform with event-driven state management. It should be designated to help IT team to control and secure self-service					

multi-cloud with governance and DevOps-based infrastructure delivery. Accordingly, the solution must enable the following:

- Offload manual tasks with advanced workflows and agile templating.
- Rapidly set up and manage multi-cloud environments throughout the lifecycle with an intuitive, self-service consumption experience.
- Establish consistent policies across multi-cloud environments and strengthen infrastructure with native compliance management, flexible cloud guardrails, and vulnerability remediation.
- Enable a powerful IaC platform with support for infrastructure pipelining and iterative development.
- Manage cost, performance, security, networking and configuration at scale for multi-cloud environments with an everything-as-code approach.
- Solution should enable end users to ask for comprehensive IT services through a common, self-service product catalog that aggregates all services, templates and images from multiple clouds and

platforms, including native public cloud services. ● Solution should enable administrators to apply predefined and custom roles, policies and approval flows to projects and organizations to provide the desired level of access for all internal users. ● Solution should support multi-level approvals, to enable administrators to add multiple policies at different approval levels, for example one level of approval could be for deployment of a resource and another related to the amount of compute requested. ● Solution should optimize infrastructure workload deployments, allowing users to model business-critical IT services by using a visual canvas with a drag-and-drop interface. Templates should also be defined through IaC using the YAML format. ● Solution should automate the application and infrastructure delivery process with release pipeline management, including visibility and analytics into active pipelines and their status for troubleshooting.					

- Solution should easily define optimized, compliant software states and enforce them across your entire environment—virtualized, hybrid or public cloud—with powerful, intuitive configuration automation. - Solution should provide integration with offered virtualization platform, hyperconverged solution and virtual network solution, but also with the operations and management platform. - Solution should support integration with third-party services including GitHub, ServiceNow ITSM, Ansible, Puppet and external IPAM providers such as Infoblox, and Microsoft Active Directory for identity management. - Solution needs to support clustering and high availability. - Licensing should be based on per-CPU licensing model **Intelligent log management for private cloud, infrastructure and applications** The scale of machine-generated data increases exponentially as enterprises span out infrastructure and application deployments across physical, virtual and cloud environments. But at the same time, because of the data volume					

and distribution, it's become overly complicated to make any sense of it. Therefore, it is required to offer solution which provides the ability to make sense of all the log data. Accordingly, the solution must enable the following: ● The solution should provide heterogeneous and highly scalable log management with intuitive, actionable dashboards, sophisticated analytics, and broad third-party extensibility, providing deep operational visibility and faster troubleshooting. ● The solution should provide intuitive and easy-to-use graphical interface for simple interactive searches as well as deep analytical queries. ● The solution should extend across physical, virtual, and cloud environments, enabling administrators to connect to everything in their environment (e.g., OS, apps, storage, network devices) and providing a single location to collect, store, and analyse logs at scale. ● The solution should collect and analyse all types of machine-generated log data (e.g., application logs, network traces, configuration				

files, messages, performance data, and system state dumps). ● The solution should provide real-time monitoring, search, and log analytics, coupled with a dashboard for stored queries, reports, and alerts, enabling correlation of events across the IT environment. ● The solution should provide machine learning-based grouping, which groups related data together to enable high-performance searching for faster troubleshooting across physical, virtual, and cloud environments. ● The solution should allow customizable data retention, and variable retention by log type. Different types of log data can have different retention periods, so administrators can create and enable a data partition with a filter and a retention period of your choice. ● The solution should provide support for third-party content packs and import of custom content-packs. ● The solution should pull events, tasks, and alarms data from the propose hypervisor solution, and integration with the proposed management solution.				

● The solution should provide native agents for Windows and Linux. ● The solution should support clustering and high availability. ● Licensing should be based on per-CPU licensing model. **Warranty and support** For offered license, it is needed to provide technical support directly from the solution vendor at all levels for 1 year, which is available 24x7, all days in the week, and which provides possibility to install latest version of the solution during a support period			

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
8. Cloud virtualization software for workload domain (non HCI, external storage)					
Virtualization Hypervisor ● Virtualization software shall provide a virtualization layer that sits directly on the bare metal server hardware with no dependence on a general-purpose OS for greater reliability and security. ● Virtualization software shall have the capability to create Virtual machines with up to 768 virtual processors and 24 TB virtual RAM in virtual machines for all the guest	Pcs	10			

operating system supported by the hypervisor. ● Virtualization software should support live migration of virtual machines with no disruption to users or loss of service, eliminating the need to schedule application downtime for planned server maintenance. ● Virtualization software should perform live migration of virtual machines files from one storage array to another without any Virtual Machine downtime. It should support this migration from one storage protocol to another (ex. FC, iSCSI, NFS, DAS). ● Virtualization software should support 4k native storage. ● Virtualization software should provide efficient, array-agnostic replication of virtual machine data over the LAN or WAN, and simplifies management by enabling replication at the virtual machine level. ● During the update process of the hypervisor, solution should provide an option to skip hardware initialization steps, and reboot only running hypervisor components. ● Virtualization software shall have High Availability capabilities for the					

virtual machines in the sense, if in case one server fails all the Virtual machines running on that server shall be automatically restarted to another physical server running same virtualization software. The feature should be independent of Guest Operating System Clustering and should work with FC/ iSCSI SAN and NAS shared storage ● Virtualization software should provide zero downtime, zero data loss and continuous availability for the applications running in virtual machines in the event of physical host failure, without the cost and complexity of traditional hardware or software clustering solutions. This option should be supported for up to 8 virtual CPUs per virtual machine with up to 128 GB RAM. ● The solution should provide option for securing virtual machines with offloaded antivirus and antimalware solutions without the need for agents inside the virtual machine with integration with 3rd party Anti-Virus/Anti-Malware solutions ● The solution should provide secure access and account management through identity federation with ADFS.					

● The solution should support for increasing capacity by adding CPU, Memory or any other devices to virtual machines on an as needed basis without any disruption in working or downtime for supported operating systems ● Virtualization software should support automated load balancing of workload across the resources allocated to workloads in a cluster. ● Virtualization software should support prioritization of storage and network access by continuously monitoring I/O load of a storage volume and over the network, and dynamically allocating available I/O resources to virtual machines according to business needs. ● Virtualization software should be able to receive server health information and migrate virtual machines from degraded hosts before problems occur. ● Virtualization software should support TPM 2.0 hardware modules and option to adds a virtual TPM device to shield guest OS from Operator or in-guest attacks. ● Solution should automate the bring-up process of the entire software platform, including deployment of infrastructure VMs, creation of the				

management cluster, configuration of VLANs, storage, physical network, and cluster creation and provisioning, but also enable a simplified patching/upgrading process of the software platform.
● Licensing should be based on per-CPU licensing model.

Virtualization and security platform for the virtual environment and SDDC

Beside virtualization hypervisor and HCI solution, it is required to enable network services across the virtualized environment and SDDC, with additional security functionalities which will provide valid security for the SDDC and workload which will use its resources, across the sites. It is required to offer solution which will provide:
● Solution must be independent of the hardware used and must allow the creation of a complete network model within the software, with the possibility of creating a simple network topology, all the way to a complex multi-tier network topology.
● Solution must support VMware vSphere and KVM hypervisor, integration with

VMware vCenter, as well as Multi-vCenter environments and federation. ● Solution must enable "distributed switching" functionality. ● Solution must enable "distributed routing", with support for multi-tier routing, dynamic routing with ECMP, as well as virtual routing and packet forwarding. The solution must support static routing for IPv4 and IPv6, BGP for IPv4 and IPv6 Unicast, HA VIP, route redistribution, active/active and active/stand-by redundancy. ● Support for EVPN. ● Support for NAT - source and destination NAT, stateless NAT, NAT logging and NAT64. ● Support for DHCP - IP blocks, subnets, pools, IPv4 and IPv6 DHCP Server / Relay. ● DNS support - IPv4 DNS relay / DNS proxy. ● Support for VPN, L2 and L3. ● Solution must have an integrated distributed firewall that operates at the vNIC level				

of each virtual machine. The defined rights must be valid even when the virtual machine changes the server where it is located.

- Distributed firewall must support the following:
  - ○ Creating stateful L2 and L3 policies
  - ○ Creating stateless L2 and L3 policies
  - ○ Creating tag-based policies, where the tag can be defined at the level of different objects, network or workload objects, IP or MAC addresses.
- Basic L7 application identification rules.
- Support for Distributed Flood Protection.
- Support for Distributed Identity Firewall using Guest Introspection and using Active Directory Event Server.
- Support for Distributed Endpoint Protection and Distributed Network Introspection.
- Solution must support "bridging" functionality between the virtual and

physical environment, ie. to enable communication between virtual machines connected to a virtualized switch and physical machines connected to physical switches (L2 bridging).				

- physical environment, ie. to enable communication between virtual machines connected to a virtualized switch and physical machines connected to physical switches (L2 bridging).
- Solution must enable load balancing functionality with server health checks, for traffic management and manipulation purposes. Minimum support for the following features:
  - Load Balancing: UDP, TCP (L4-L7), HTTP
  - Supported algorithms: Round Robin, Source IP hash, least connection.
  - Health Checks: TCP, ICMP, UDP, HTTP, HTTPs
- Solution must enable the creation of network services for the needs of container and Kubernetes environments and applications, as well as enable communication between services, ie. container-based applications and services located on virtual machines.

● Support for automation and use of API for integration with other solutions:
   ○ REST API
   ○ JSON
   ○ Java SDK
   ○ Phyton SDK
   ○ Terraform
   ○ Ansible
● Solution must have advanced tools for network monitoring and management:
   ○ Tunnel Health Monitoring
   ○ TraceFlow
   ○ Port Mirroring
   ○ Port Connectivity Tool
   ○ Packet Capture
● Solution must have a platform for collecting and intelligent analysis of different types of logs related to the solution, and to enable easy search of collected logs, monitoring and assistance in solving problems, analysis of flows and generated alerts.
● Solution must provide layer 4 VM-to-VM traffic flow analysis, layer 4 automated security policy creation and network traffic analytics.					

• Solution must provide separate GUI which will enable advanced network monitoring options, including:
  o Support for virtual flows (VDS IPFIX, V2V, V2P)
  o Firewall network segmentation planning and operations.
  o Visibility across third-party switches, routers, firewalls and load balancers, including public cloud environments such are AWS and Azure.
  o Network device auto discovery.
  o Flow/threshold analytics and reporting.
  o Physical flows (NetFlow v7 and v9, and sFlow)
  o Visibility for Kubernetes traffic
  o Network and security analytics (top talkers, anomalies, outlier detection, etc.).
  o Flow-based application discovery (powered by machine learning)					

o Support for Cisco Application Centric Infrastructure (ACI), Cisco BGP-EVPN and Arista BGP-EVPN underlay/overlay visibility, Juniper Ethernet VPN VM-to-VM path. ● Solution must enable secure authentication and authorization of users, with integration with Active Directory, support for authentication through OpenLDAP, creation of conditional access policies and Role Based Access Control. ● Licensing should be based on per-CPU licensing model **Solution for monitoring, capacity planning and troubleshooting** Building SDDC with different hardware and software components require possibility to have detailed overview of whole solution, utilization of all resources with option to plan and estimate capacity utilization and single view for troubleshooting. Complete solution must enable simple and intelligent monitoring of the performance and utilization of the					

entire virtual infrastructure. Accordingly, the solution must enable the following: ● Highly available scale-out platform with configurable reviews and reports. ● Visualization: Out-of-the-Box Dashboards, Views, Reports, Heat Map, Performance Charts. ● Possibility of creating flexible operational policies and operational groups ● Defining users and assigning appropriate rights to users (Role-based access control) ● The solution should have self-learning analytics to define and monitor system performance, as well as the ability to dynamically define limits. ● Real-Time Predictive Capacity Management, Including Trending, Metering, Rightsizing, Optimization. ● Intelligent and advanced alert management (alerts), in such a way that instead of generating more alerts, only one is generated that directly points to the root cause of the problem, while generating recommendations on how to					

solve and overcome the reported problem. ● Monitoring of spent capacity, and trends related to growth or reduced capacity consumption (capacity model-driven analytics), analysis of the correct definition of the capacity of individual services (to avoid oversizing or under-sizing of the same) and optimization of the same. ● Creating what-if analysis and reports, in order to provide a simple insight into how certain changes and activities affect the entire system (analysis that should show the impact of adding or subtracting certain HW resources, the impact of adding a new workload, related assessments for service migration between data centers, or between public cloud environments). ● Monitoring the utilization of resources, their planning and optimization, regardless of the type of object being observed, including data from third systems. ● Solution should discover services running in each VM					

and then build a relationship or dependencies between services from different VMs based on the network communication. It should create dynamic applications based on the network communication between the services.

- Monitoring OS resources - CPU, disk, memory and network.
- Physical OS Monitoring.
- Integration with the offered server virtualization platform and hyperconverged platform, as well as with the log monitoring and analysis platform.
- Ability to use additional management packages that allow monitoring of various hardware components, such as storage and network devices, as well as management packages for monitoring Kubernetes environment, which can be on-premises or within public cloud services.
- Application Performance Management Tool Integration (AppDynamics, Datadog, Dynatrace, New Relic).

● It is necessary to provide a simple insight into the total costs of the complete SDDC system, as well as a clear understanding of how and in what way the available resources are spent. The solution should enable:
    ○ Automatic data collection and cost analysis covering the entire SDDC environment.
    ○ Easy overview and comparison of costs and costs of certain services if they are created within a private or public cloud environment.
    ○ Identifying and improving resource utilization based on received cost reports.
● Licensing should be based on per-CPU licensing model.
 	
Modern infrastructure automation platform
It is required to provide a modern infrastructure automation platform with event-driven state management. It should be designated to help IT					

team to control and secure self-service multi-cloud with governance and DevOps-based infrastructure delivery. Accordingly, the solution must enable the following:

- Offload manual tasks with advanced workflows and agile templating.
- Rapidly set up and manage multi-cloud environments throughout the lifecycle with an intuitive, self-service consumption experience.
- Establish consistent policies across multi-cloud environments and strengthen infrastructure with native compliance management, flexible cloud guardrails, and vulnerability remediation.
- Enable a powerful IaC platform with support for infrastructure pipelining and iterative development.
- Manage cost, performance, security, networking and configuration at scale for multi-cloud environments with an everything-as-code approach.
- Solution need to enable end users to ask for comprehensive IT services through a common,

self-service product catalogue that aggregates all services, templates and images from multiple clouds and platforms, including native public cloud services. ● Solution need to enable administrators to apply predefined and custom roles, policies and approval flows to projects and organizations to provide the desired level of access for all internal users. ● Solution need to support multi-level approvals, to enable administrators to add multiple policies at different approval levels, for example one level of approval could be for deployment of a resource and another related to the amount of compute requested. ● Solution need to optimize infrastructure workload deployments, allowing users to model business-critical IT services by using a visual canvas with a drag-and-drop interface. Templates should also be defined through IaC using the YAML format. ● Solution need to automates the application and infrastructure					

delivery process with release pipeline management, including visibility and analytics into active pipelines and their status for troubleshooting. ● Solution need to easily define optimized, compliant software states and enforce them across your entire environment—virtualized, hybrid or public cloud—with powerful, intuitive configuration automation. ● Solution need to provide integration with offered virtualization platform, hyperconverged solution and virtual network solution, but also with the operations and management platform. ● Solution need to support integration with third-party services including GitHub, ServiceNow ITSM, Ansible, Puppet and external IPAM providers such as Infoblox, and Microsoft Active Directory for identity management. ● Solution need to support clustering and high availability.					

● Licensing should be based on per-CPU licensing model **Intelligent log management for private cloud, infrastructure and applications** 　The scale of machine-generated data increases exponentially as enterprises span out infrastructure and application deployments across physical, virtual and cloud environments. But at the same time, because of the data volume and distribution, it's become overly complicated to make any sense of it. Therefore, it is required to offer solution which provides the ability to make sense of all the log data. Accordingly, the solution must enable the following: 　● The solution should provide heterogeneous and highly scalable log management with intuitive, actionable dashboards, sophisticated analytics, and broad third-party extensibility, providing deep operational visibility and faster troubleshooting. 　● The solution should provide intuitive and easy-to-use graphical interface for simple interactive searches as well as deep analytical queries.					

- The solution should extend across physical, virtual, and cloud environments, enabling administrators to connect to everything in their environment (e.g., OS, apps, storage, network devices) and providing a single location to collect, store, and analyse logs at scale. - The solution should collect and analyse all types of machine-generated log data (e.g., application logs, network traces, configuration files, messages, performance data, and system state dumps). - The solution should provide real-time monitoring, search, and log analytics, coupled with a dashboard for stored queries, reports, and alerts, enabling correlation of events across the IT environment. - The solution should provide machine learning-based grouping, which groups related data together to enable high-performance searching for faster troubleshooting across physical, virtual, and cloud environments.					

- The solution should allow customizable data retention, and variable retention by log type. Different types of log data can have different retention periods, so administrators can create and enable a data partition with a filter and a retention period of your choice. - The solution should provide support for third-party content packs and import of custom content-packs. - The solution should pull events, tasks, and alarms data from the proposed hypervisor solution, and integration with the proposed management solution. - The solution should provide native agents for Windows and Linux. - The solution should support clustering and high availability. - Licensing should be based on per-CPU licensing model. **Warranty and support** For offered license, it is needed to provide technical support directly from the solution vendor at all levels					

for 1 year, which is available 24x7, all days in the week, and which provides possibility to install latest version of the solution during a support period				

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
9. Central virtualization console					
Management • Solution needs to include single point of management across all different hosts and virtual machines, which will provide HTML 5 based GUI, with option to check all alarms and notifications, simple search across all different components and which will include integrated solution for backup and recovery. Solution need to enable simple orchestration which can automate some of the tasks, and which will also provide audit trail of all configuration changes. • Beside this, integrated management should support: - Desired state configuration management capabilities. - Create and generate interoperability and pre-	Pcs	2			

upgrade checks report, which will help in upgrade planning. - Provide native high availability configuration. - Provide native backup and restore functionality of the integrated management solution. - Enables unified visibility and management across on-premises environment and cloud-based environments. - Enable creation and management of up to 96 nodes in single cluster. • Licensing should be based per instance and offer need to include licenses for at least 2 instances. **Warranty and support** For offered license, it is needed to provide technical support directly from the solution vendor at all levels for **1 year**, which is available 24x7, all days in the week, and which provides possibility to install latest version of the solution during a support period.					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
10. Software for Backup & Replication					
General requirements • Backup software must be licensed **perpetual**, • Backup software must be licensed for backup and replication of **200 virtual machines** (instances - workloads), •Backup software must work with VMware infrastructure based on version 6.0, 6.5, 6.7, 7.0 and 8.0 and Hyper-V 2012, Hyper-V 2012 R2, Hyper-V 2016, Hyper-V 2019 and Hyper-V 2022. All functionalities in this specification MUST be supported on all hypervisor versions mentioned. • Software must support hosts managed by VMware vCenter Server and standalone hosts. • Software must support Hyper-V hosts managed by System Center Virtual Machine Manager, clustered hosts and standalone hosts and Nano Server install mode • Software must support backing up all operating systems that are supported by VMware or Hyper-V	Pcs	1			

• Software must support backing up file shares from NAS-based devices using SMB/CIFS and NFS shares and directly from Windows and Linux file servers. **Total Cost of Ownership** • Software must be „hardware agnostic" and must utilize any server and storage hardware • Software must create self-containing backup archives in form of files that are freely movable with option to create such files per backup job or per VM • Software must deliver a native backup movement engine that can move backups between any backup repository type and between backup jobs without triggering a new full backup or abandoning the existing backup chain. • Software must allow creating backups in full, synthetic full, incremental and reverse incremental modes. • Software must have deduplication and compression mechanisms resulting in reduction of storage space for backup files. Enabling deduplication and/or compression mustn't disable any functionality mention in the specification					

• Software must provide an abstraction layer over individual storage devices (extents) to create a single virtual pool of backup storage for storing backups. Unlimited number of storage pools and extents must be supported. • Software must allow creation of backup repository directly on Microsoft Azure Blob, Google Cloud Platform, Amazon S3, Wasabi Cloud Storage and S3 compatible storages. Additionally, solution must support archiving those backups to Microsoft Azure Archive Blob Storage and Amazon S3 Glacier. Storing backups to object storage cannot impact any of the restore scenarios. • Software must allow for creating immutable backup repositories for ransomware protection, by not allowing deletion or modification of backup files for a defined period of time. • Software cannot use central database for storing any kind of deduplication metadata. Losing database cannot render backup files unrestorable. Deduplication metadata must be stored within the backup files • Software can NOT require installation of any kind of permanent agent inside VMs that requires maintenance, deployment, upgrade					

etc., for all backup and restore operations • Software must use „single pass backup" with ability to exclude single files and folders from processing. "Single pass backup" is required for all kind of restore purposes including granular restores • Software must allow any kind of script to be attached and executed as a pre or post backup task or pre or post VM snapshot • Software must offer self service portal when users can restore files, VMs, MS Exchange objects and MS SQL databases, Oracle databases and PostgreSQL databases (including point-in-time restore) • Software must allow delegation of restore permissions on the self-service portal • Software must have ability to integrate with other systems using built-in REST API • Software must offer encryption of whole network traffic between all components as well as "at rest" encryption of backup files in repository. Encryption can't disable any functionality mentioned in specification. • Software must offer encryption password loss protection				

• Software must support IPv6 in both IPv6-only and dual-stack networks, Kerberos-only authentication and gMSA accounts for Windows • Software must have client/server architecture with ability to install multiple instances of administration console. • Software must support secure access to the backup console with optional two-factor authentication (2FA) that's based on Time-Based One-Time Passwords (TOTP) as per RFC 6238. **Recovery Point Objective Requirements** • Software must take advantage of Change Block Tracking mechanism. Software must offer that for all supported hypervisors, CBT implementation must be certified by hypervisor vendor. • Software must take advantage of Change File Tracking mechanism for file share backups • Software must offer ways of throttling stress on production storage during backup in a way that backup is affecting latency of production storage in a controllable way. This must be offered for all supported hypervisors. This feature must be configurable on datastore level					

• Software must allow creating backups by integrating with storage snapshots. Additionally must allow individual VM, file and application item restore from those snapshots. The backup process cannot use any temporary host to mount the snapshot. Described functionality must work for VMware vSphere environment. • Software must have official, VMware certified, support for VMware vSAN • Copies must allow creating and retaining GFS (Grandfather-father-son) retention policy • Software must support BlockClone API when Windows Server 2016 or 2019 with ReFS file system is used as backup repository • Similar functionality must be provided for repositories based on Linux XFS filesystem. • Software must have ability to copy restore points and replicate VMs to remote location with technology based on built-in WAN acceleration • Software must have replication of production VMs directly from supported infrastructures, between virtualization hosts, including asynchronous continuous replication and continuous replication (CDP). CDP replication must have the option				

to create periodical application consistent restore points for recovery.
• Software must allow keeping multiple restore points on replica VMs
• Software must leverage all backup transport modes supported by hypervisor (network, hot-add, direct SAN and direct NFS access)
• Software must allow parallel processing of VMs and their disks including parallel restore of virtual disks in full VM restore mode.

Recovery Time Objective Requirements
• Software must allow instant restore of multiple virtual machines simultaneously, directly from the backup files from any restore point (built in NFS Server functionality). This functionality must be supported for VMware and Hyper-V environments and must work regardless of hardware used for storing VM backup files.
• Additionally for vSphere and Hyper-V environments the above functionality must allow to run a backup created from different platforms (different hypervisor, physical and public cloud VMs).
• Software must allow on-line migration of VMs that run in that manner to production storage using

hypervisor's features. Solution must also provide its own feature that will provide such capability. • Software must allow to present disk(s) directly from backup file to a running VMware VM. • Software must allow full VM restoration, VM files, or VM disks. • Software must allow full VM restoration directly to Microsoft Azure, Azure Stack, Amazon EC2 and Google Compute Engine. • Software must allow restoration of files and their permissions to operator's machine or directly to VM running in production without need of agent installed inside VM. There must be no file size or file amount limitation during agentless restore. • Software must support files restoration from following systems: Windows, Linux, BSD, Solaris, Mac, Novell • Software must support file restore from Linux LVM and Windows Storage Spaces. • Software must allow instant recovery of NAS backups (SMB file shares) directly from backup file in a form of emulated SMB share. Migration of file shares to production environment must be automated and controlled by Backup Software itself.					

• Software must allow rapid and granular restoration of application objects without using any agent installed inside VMs. • Software must support Active Directory granular restore of any object and any attribute of this object including password, Group Policy Objects, AD configuration partition, AD integrated DNS records, Microsoft System Objects, CA certificate information and AD Sites subnet items • Software must support Microsoft Exchange 2013 SP1 and later granular restore of any object • Software must support granular restore of Microsoft SQL 2008 SP4 and later including databases with point-in-time recovery option, tables, schema. • Software must support granular restore of Microsoft Sharepoint Server 2013 and later. • Software must support granular restore of Oracle databases with point-in-time recovery and Oracle DataGuard enabled. This must be offered for databases running on Windows and Linux operating systems. • Software must support granular restore of PostgreSQL databases with point-in-time recovery. This must be					

offered for databases running on Linux operating systems. • Software must allow instant recovery of MS SQL and Oracle DBs directly from backup file to a running database server. Migration of DBs to production environment must be automated and controlled by Backup Software itself. • Software must allow native plugin integration for Oracle RMAN backup • Software must allow native plugin integration for SAP HANA backup • Software must allow native plugin integration for Microsoft SQL VDI backup • Software must allow „reverse CBT" and direct SAN restores **Risk Mitigation** • Software must allow creation of Virtual Lab (isolated environment) for VMware and Hyper-V infrastructure using VMs ran directly from backup files. The above functionality must allow to run a backup created from different platforms (different hypervisor, physical and public cloud VMs). For VMware it must also offer creating such environment from VM replicas and directly from storage snapshots created on supported devices.					

• Software must have backup restoration verification mechanisms allowing of testing VMs restoration in isolated network environment for VMware and Hyper-V infrastructure. Verification must allow testing application inside VM with custom or predefined scripts. Verification must be schedulable and completely automated. • Software must have integration with antivirus software to scan image-level backup before restore to production environments. Scanning must be done on a filesystem within the backup file, without the need of extracting the data beforehand. The integration must include at least Windows Defender, Symantec Protection Engine, ESET NOD32 and Bitdefender. • Software must allow for an automated 2-stage recovery of virtual machines, allowing for injection of custom scripts to alter data before restoring to production environment. **Warranty and support** 3 year of Production (24/7) Support					

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
11. Upgrade of an existing storage solution					
General storage (disk array) requirements It is necessary to offer the minimum the following configuration for expansion of the existing storage system (**Huawei Dorado 5000v6**): • One NVMe disc enclosures, each 2U, with 100Gbps connectivity which can connect with existing Huawei Dorado 5000v6 storage. • Minimum **30 disks**, minimum capacity of **3,84TB NVMe SSD**. • Minimum 2 cables of 100Gbps to connect new enclosures with existing storage system with minimum length of 1m. • SmartDedupe & SmartCompression Software Capacity License Standard Edition (Per TB) for 116TB. • Additional hardware or licenses for external virtualization is not accepted	**Pcs**	**1**			

Warranty and support
    Minimum 36 months of vendor
    support 9x5 NBD (Next business day)
    for above mentioned				

Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
12. Upgrade of the system for automated monitoring analytics and reporting of AMRES School and IP/MPLS network					
Introduction Through realization of the Republic of Serbia Government program "Development of ICT infrastructure in educational, science and cultural institutions" AMRES from 2016th connect all major locations of primary and secondary schools in the Republic of Serbia in unified infrastructure called the AMRES school network. The major school's locations are connected through the framework agreements between AMRES and Telecom Serbia as a service provider for almost 1600 school locations. From 2020th until 2023rd t inside the AMRES school network has been connected	Pcs	1			

around 2300 new schools' remote locations. All schools' locations are currently connected by different access technologies that include dark-fiber (DF) links, L3VPN optical access lines with symmetric or asymmetric throughput, L3VPN xDSL access lines and L3VPN mobile access. During the same period Ministry responsible for telecommunication together with Ministry of education and science through the project "Connected schools" worked on improving LAN network infrastructure for around 2000 school's location and install appropriate passive, cable infrastructure and active equipment including LAN switches and wireless access points. AMRES also manage AMRES backbone network based on IP/MPLS technology in 50 cities around the Republic of Serbia with approximately 70 point of presence (PoP) locations. Almost 300 different Republic of Serbia research and education institutions are directly connected to AMRES PoPs. AMRES core and access networks consists of the around 4000km of dark fiber optical links. AMRES also manage its own DC infrastructure in the AMRES central PoP location where all AMRES central				

network, servers and storage devices are located.

Scope of item

Scope of this item is upgrade of the existing system for automated monitoring analytics and reporting of AMRES School and IP/MPLS network (in further text System) as well as services for System installation, System configuration according to the requests in this technical specification, integration with the AMRES school and IP/MPLS network, technical support and System maintenance. The System should provide automated monitoring and analytics of all the relevant components of the AMRES School and IP/MPLS network together with the advanced reporting capabilities.

The AMRES currently use the performance monitoring system to monitor CPE devices in around 3900 school locations already connected to the AMRES school network as well as currently installed components in the AMRES central location of AMRES school network. The current system includes licenses for monitoring of 4600 different devices. The offer must include system and licenses upgrade

for performance monitoring of the added 3000 schools' network LAN switches and 100 AMRES core routers that are or will be installed in the school locations connected to the AMRES school network as well as in the AMRES PoPs locations or central location of AMRES school network. If the offer does not imply upgrade of existing system and will propose totally new System solution and installation, then offer must include system and licenses for performance monitoring of 7800 different physical network and DC infrastructure devices. The offer should also include service for configuration of 3000 schools' network LAN switches for appropriate network monitoring protocols (e.g. SNMP, syslog, NETCONF, telemetry etc.) in order to support remote performance monitoring. The offered System license should be perpetual license (no time expiration). If the System requires commercially licensed operating system or other software, the offer should include all the required software with the perpetual licenses. The license should include the High availability feature, so if the System requires multiple				

licenses to achieve high availability, these licenses should be provided.

The System has to be scalable, so that it can support monitoring of the 10000 different network and infrastructure devices, by adding only additional hardware and software licenses.

Offered System and licenses should minimally support all features and functionalities described in the following sections.

General System requirements

Offered System should minimally support following general features and requirements:

- The system should support installation on Linux operating systems using Virtual Machine (VM) infrastructure.

- Support for high availability feature which can be achieved by creating a cluster of servers using 2 or more servers. The failover between servers in the cluster should be possible automatically without user (human) interaction.

- Support for system scalability, so that scalability of the system can be easily achieved.

- Monitoring of multivendor network equipment using the following protocols and data formats:

  - Connectivity testing using ICMP Ping probes
  - SNMP v1, v2c and v3 for monitoring metrics collection
  - OpenConfig gRPC Telemetry
  - JTI (Juniper Telemetry Interface) over UDP
  - NETCONF using XML RPC
  - REST API using JSON
  - Syslog protocol (support RFC 3164 and RFC 5424)
  - SNMP Traps v1, v2c and v3
  - NetFlow v5, v9 and IPFIX – (the system should include license and the support for receiving and processing 10000 flows per seconds and receiving flows from all network devices (3000 devices))
- The System should continuously poll network monitoring metric at the configurable period. This period should be configurable within the seconds precision level with the minimum period of at least 30 sec.

- Collected metrics should be saved in the system for configurable amount of time, at least 1 year.

- Possibility to define composite metric which are created from one or more

collected metrics using elementary arithmetic operations.
 	
 ● System configuration and administration can be done using configuration files and/or CLI and/or Web UI.
 	
 ● Support for alarm generation by comparing one or more of collected metrics against configurable thresholds.
 	
     o Alarms criteria will be further defined by AMRES
     o Support for alarm notifications sending using following methods:
         ▪ Email
         ▪ Slack
         ▪ Webhook (HTTP POST)
         ▪ Kafka
         ▪ MQTT
         ▪ Bash script execution
 ● All system components should be integrated under the single graphical, web-based user interface with the single user authentication mechanism.
 	
 ● Graphical user interface should support user authentication with the support for LDAP user database. The System should be able to integrate with AMRES OpenLDAP server.
 	
 ● Support for arbitrary number of different user groups which can have different access rights (read-only and read-write)				

under different parts of the graphical user interface.

● Support for creation of user configurable Views of collected metrics and logs from network devices and systems. These configurable Views should support and display the following metric visualizations:

  ○ Table View
  ○ Time-based Graph
  ○ Categorical metrics
  ○ Topology diagrams with selected monitoring data
  ○ Geo maps with selected monitoring data

● Support for configurable grouping of Views into Groups or Folders.

● The Table View visualization should support export data to CSV file, configurable cell visualization (change of the text colour and change of the cell colour depending on the cell value) and linking cells to arbitrary System Views or external Web URLs. The Table view should support for ascending or descending sorting on each column.

● The Time-based Graphs visualization of the metric should be able to display one or multiple metrics of the same type. The display of multiple metrics of the same type on the same Graphs should be

supported for easy comparison. Graphs should be configurable to display with or without legend. Graph's legend should provide description of each metric coupled with current, average, minimum and maximum values of the displayed metric. In case of representation of multiple metrics, it should be possible to select one of them, which will be than solely displayed on the Graph. User should be able to select arbitrary time period for display. The resolution of displayed metric should be configurable with the seconds precision, with the minimum period of 30 seconds. Graphs should support configurable way of data visualization – lines, dots and bars. Graphs visualization with multiple metrics should also support stacking of the values. Graphs should display a tooltip with the metric value at a particular time, which is determined by the mouse cursor position over the Graph. ● The Categorical metric visualization should support Bar chart and Pie chart display with and without the legend. ● The Topology diagram visualization should support manually defined topology. The diagram should support display of the user defined metric values related to the elements shown on the topology diagram (network devices or links)				

- The Geo maps visualization should display user selected metrics associated with the geo coordinates over the geographical map of Republic of Serbia (for example, connectivity status of the school's CPE devices or LAN switches or AMRES core network devices) - Support for reports creation from arbitrary defined presentations (Views). - Support for System's internal monitoring – monitor the most important performance parameters for detection of potential scalability issues and troubleshooting purposes. Support for automated detection of newly connected schools and activated service provider links and automated configuration of the system to monitor newly connected links and CPE devices. Table view of connected schools and their connection activation time. The table should display the following information: school name, city, organization ID, location ID, IP address of CPE device, connection (link) type, connection activation time. **Initial System configuration requirements** **The AMRES network global overview requirements**				

New feature requirements (i) Continuous monitoring and display of statuses and availability for all LAN switches inside the AMRES school network installed through the Project "Connected schools" ● Presentation of total number of currently active LAN switches inside the AMRES school network, total number of currently inactive LAN switches inside the AMRES school network, number of unavailable LAN switches inside of the AMRES school network in an arbitrarily selected time interval. ● The time-based Graph presentation for number of active and inactive LAN switches inside the AMRES school network in an arbitrarily selected time interval. ● Presentation of average response time for all LAN switches inside the AMRES school network in last 10 minutes (minimal, maximal and average value for average response time). ● Tabular presentation (Table View) of all LAN switches statuses inside the AMRES school network for the previous 10 minutes from the moment of execution. The table should display next columns: LAN switch IP address, LAN switch				

hostname, city, name of school, Institution ID, Location ID, link type, response time, packet loss percentage, link status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, LAN switches IP address, LAN switch hostname etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).

● Tabular presentation (Table View) of the AMRES school network LAN switches availability in an arbitrarily selected time interval. The table should display next columns: LAN switch IP address, LAN switch hostname, city, name of school, Institution ID, Location ID, link type, availability percentage etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, LAN switch IP address, LAN switch hostname etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).

(ii)   The map with status of the LAN switches for the school locations inside the AMRES school network that

participate in the Project "Connected schools"

● The GEO map with precise school location geo coordinates that present statuses of all the LAN switches by school location in last 5 minutes from time of execution. All locations must be represented by an appropriate graphic symbol that visualize aggregated LAN switches connection status for that location (e.g. no packet loss to LAN switches on particular location, there is a packet loss up to 100%, there is a total (100%) packet loss to LAN switches on particular location etc.). Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual school location or zooming out for simultaneous display of all school locations connected to the AMRES school network on the Republic of Serbia territory. The map must have possibility for filtering graphical display of the school locations by arbitrarily number of selected parameters such as: installed switches type (type1, type2, type3 etc.), a school type (e.g. primary school, vocational high school, gymnasium etc.) etc.

(iii)   Collection and review of the operational log messages for all LAN switches inside the AMRES school network

installed through the Project "Connected schools"

- Presentation of the number of operational log messages by standard categories for LAN switches in AMRES school network in an arbitrarily selected time interval.

- The time-based Graph presentation for the number of operational log messages per time unit by categories for LAN switches in AMRES school network in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages by category selected on the graph.

- Tabular presentation (Table View) of operational log messages for installed LAN switches in AMRES school network in an arbitrarily selected time interval. The table should display next columns: log message receive time, severity of operational log message, log message etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Location ID, LAN switch IP address, severity of operational log message, regular expression search for operational log message etc. (e.g. selection of one or more cities, selection of one or more Location ID, simultaneous combinations of multiple filtering parameters etc.).

(iv) Continuous monitoring and display of installed software for all LAN switches inside the AMRES school network installed through the Project "Connected schools" ● Presentation of total number of currently active LAN switches inside the AMRES school network, total number of currently inactive LAN switches inside the AMRES school network ● Presentation of distribution (Categorical metric) for total number of active LAN switches of the school locations connected inside the AMRES school network by categories in an arbitrarily selected time interval. Display categories must be configurable (e.g. by LAN switch model, by OS version, by firmware version, by WAN link type etc.). ● Tabular presentation (Table View) of the active AMRES school network LAN switches installed software in an arbitrarily selected time interval. The table should display next columns: LAN switch IP address, LAN switch hostname, city, name of school, Institution ID, Location ID, switch model, switch serial number, OS version, firmware version etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, LAN switch IP				

address, OS version, firmware version etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).

(v)   Continuous monitoring and display of statuses and availability for all AMRES IP/MPLS core network devices

- Presentation of total number of currently active AMRES IP/MPLS core network devices, total number of currently inactive AMRES IP/MPLS core network devices, number of unavailable AMRES IP/MPLS core network routers in an arbitrarily selected time interval.

- The time-based Graph presentation for number of active and inactive AMRES IP/MPLS core network routers in an arbitrarily selected time interval.

- Presentation of average response time for all AMRES IP/MPLS core network devices in last 10 minutes (minimal, maximal and average value for average response time).

- Tabular presentation (Table View) of all AMRES IP/MPLS core network devices statuses for the previous 10 minutes from the moment of execution. The table should display next columns: network device IP address, network device hostname, city, name of AMRES PoP institution, response

time, packet loss percentage, link status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of institution, network device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution, simultaneous combinations of multiple filtering parameters etc.).

- Tabular presentation (Table View) of all AMRES IP/MPLS core network devices availability in an arbitrarily selected time interval. The table should display next columns: device IP address, city, name of institution, availability percentage etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of institution, device IP address, device hostname etc. (e.g. selection of one or more cities, selection of one or more Institution, simultaneous combinations of multiple filtering parameters etc.).

(vi) Continuous monitoring and display of statuses, quality and data traffic for all AMRES IP/MPLS core and access network links

- Presentation of total number of currently active AMRES core links, total number of currently active AMRES access links, total number of currently inactive AMRES core

links, total number of currently inactive AMRES access links.

- The time-based Graph presentation for number of active and inactive AMRES core and access links in an arbitrarily selected time interval.

- Tabular presentation (Table View) for the status and quality of all AMRES IP/MPLS core network devices core links in an arbitrarily selected time interval. The table should display next columns: device IP address, device name, city, interface number, interface operational status, interface administrative status, interface description, core link type, core link number, ingress interface error volumes, egress interface error volumes, interface uptime etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, core link number, interface description, etc. (e.g. selection of one or more cities, selection of one or more interfaces, simultaneous combinations of multiple filtering parameters etc.).

- Tabular presentation (Table View) for the status and quality of all AMRES IP/MPLS core network devices access links in an arbitrarily selected time interval. The table should display next columns: device IP address, device name, city, interface

number, interface operational status, interface administrative status, interface description, access link type, access link number, ingress interface error volumes, egress interface error volumes, interface uptime etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, access link number, interface description, etc. (e.g. selection of one or more cities, selection of one or more interfaces, simultaneous combinations of multiple filtering parameters etc.).

● Tabular presentation (Table View) for the data traffic and packet volumes statistics of all AMRES IP/MPLS core network devices core links in an arbitrarily selected time interval. The table should display next columns: device IP address, device name, city, interface number, interface description, core link number, maximum interface input traffic, average interface input traffic, maximum interface output traffic, average interface output traffic etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, core link number, interface description, etc. (e.g. selection of one or more cities, selection of one or more

interfaces, simultaneous combinations of multiple filtering parameters etc.).

- Tabular presentation (Table View) for the data traffic and packet volumes statistics of all AMRES IP/MPLS core network devices access links in an arbitrarily selected time interval. The table should display next columns: device IP address, device name, city, interface number, interface description, access link number, maximum interface input traffic, average interface input traffic, maximum interface output traffic, average interface output traffic etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, access link number, interface description, etc. (e.g. selection of one or more cities, selection of one or more interfaces, simultaneous combinations of multiple filtering parameters etc.).

- Tabular presentation (Table View) for the current statuses of all relevant interface optical transceivers of all AMRES IP/MPLS core network devices core links in an arbitrarily selected time interval. The table should display next columns: device IP address, device name, city, interface number, interface description, core link number, optical transceiver temperature, transmitting signal optical power,

receiving signal optical power, the optical transceiver alarms etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, core link number, interface description, etc. (e.g. selection of one or more cities, selection of one or more interfaces, simultaneous combinations of multiple filtering parameters etc.).

(vii) Continuous monitoring and display of BGP, LDP and ISIS protocol statuses for all AMRES IP/MPLS core network devices

- Tabular presentation (Table View) for BGP sessions statuses for all AMRES IP/MPLS core network devices to the AMRES RR neighbouring routers. The table must display next columns: device name, device IP address, BGP RR IP address, BGP session status, elapsed time from last BGP session status change, number of active prefixes, number of received prefixes, number of accepted prefixes etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of device, device IP address, BGP RR IP address etc. (e.g. selection of one or more devices names, selection of one or more BGP RR IP addresses,

simultaneous combinations of multiple filtering parameters etc.).

● Tabular presentation (Table View) for LDP sessions statuses for the neighbouring routers of all AMRES MPLS core network devices. The table must display next columns: core router IP address, neighbour IP address, LDP session ID, LDP session state, LDP session connection, LDP session uptime etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of device, device IP address etc. (e.g. selection of one or more devices names, selection of one or more neighbour IP addresses, simultaneous combinations of multiple filtering parameters etc.).

● Tabular presentation (Table View) for ISIS sessions statuses for the neighbouring routers of all AMRES MPLS core network devices. The table must display next columns: core router IP address, core router interface, neighbour IP address, neighbour device hostname, ISIS session state, ISIS session uptime etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of device, device IP address etc. (e.g. selection of one or more devices names, selection of one or more neighbour IP addresses,

simultaneous combinations of multiple filtering parameters etc.).

(viii) The map with status of all AMRES IP/MPLS core network devices in the AMRES backbone network

- The GEO map with precise AMRES PoP location geo coordinates that present statuses of all AMRES IP/MPLS core network devices by location in last 5 minutes from time of execution. All locations must be represented by an appropriate graphic symbol that visualize aggregated device status for that location (e.g. no packet loss to device on particular location, there is a packet loss up to 100%, there is a total (100%) packet loss to device on particular location etc.). Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual PoP location or zooming out for simultaneous display of all AMRES PoP locations in the Republic of Serbia territory. The map must have possibility for filtering graphical display of the locations by arbitrarily number of selected parameters such as: installed device type (type1, type2, type3 etc.) etc.

(ix) Collection and review of the operational log messages for all AMRES IP/MPLS

core network devices in the AMRES backbone network

- Presentation of the number of operational log messages by standard categories for the AMRES IP/MPLS core network devices in an arbitrarily selected time interval.

- The time-based Graph presentation for the number of operational log messages per time unit by categories for the AMRES IP/MPLS core network devices in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages by category selected on the graph.

- Tabular presentation (Table View) of operational log messages for the AMRES IP/MPLS core network devices in an arbitrarily selected time interval. The table should display next columns: log message receive time, severity of operational log message, log message etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device name, device IP address, severity of operational log message, regular expression search for operational log message etc. (e.g. selection of one or more cities, selection of one or more IP addresses, simultaneous

combinations of multiple filtering parameters etc.).

(x) Continuous monitoring and display of installed software for all AMRES IP/MPLS core network devices in the AMRES backbone network

● Presentation of total number of currently active AMRES IP/MPLS core network devices in the AMRES backbone network, total number of currently inactive AMRES IP/MPLS core network devices in the AMRES backbone network

● Presentation of distribution (Categorical metric) for total number of active AMRES IP/MPLS core network devices in the AMRES backbone network by categories in an arbitrarily selected time interval. Display categories must be configurable (e.g. by device model, by OS version, by firmware version etc.).

● Tabular presentation (Table View) of the active AMRES IP/MPLS core network devices installed software in an arbitrarily selected time interval. The table should display next columns: device IP address, device hostname, city, AMRES PoP name, device model, device serial number, OS version, firmware version etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, device hostname,

AMRES PoP name, device IP address, OS version, firmware version etc. (e.g. selection of one or more cities, selection of one or more device IP addresses, simultaneous combinations of multiple filtering parameters etc.). ● Tabular presentation (Table View) of components inventory for all AMRES IP/MPLS core network devices. The table must display next columns: device name, device loopback IP address, name of the device component, device component description, device component model, device component serial number, device component status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, AMRES PoP institution name device IP address, device name etc. (e.g. selection of one or more cities, selection of one or more Institution, simultaneous combinations of multiple filtering parameters etc.). **Existing System features** (xi) Continuous monitoring and display of statuses, availability and link quality for all CPE devices inside the AMRES school network ● Presentation of total number of currently active CPE devices inside the AMRES school network, total number of currently				

inactive CPE devices inside the AMRES school network, number of unavailable CPE devices inside of the AMRES school network in an arbitrarily selected time interval. ● The time-based Graph presentation for number of active and inactive CPE devices inside the AMRES school network in an arbitrarily selected time interval. ● Presentation of average response time for all CPE devices inside the AMRES school network in last 10 minutes (minimal, maximal and average value for average response time). ● Tabular presentation (Table View) of all CPE device statuses inside the AMRES school network for the previous 10 minutes from the moment of execution. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, response time, packet loss percentage, link status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).				

• Tabular presentation (Table View) of all AMRES school network CPE devices availability in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, availability percentage etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.). • Tabular presentation (Table View) for the quality of all AMRES school network links toward the schools in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, number of measurement samples in which link had packet loss, percentage of time in which link had a packet loss, average percentage of packet loss in time intervals with the packet loss etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID,				

simultaneous combinations of multiple filtering parameters etc.). (xii) Continuous monitoring and display of number of LAN devices that are connected inside the AMRES school network for all school locations ● Presentation of total number of currently active devices in LAN networks of all school locations connected inside the AMRES school network. ● The time-based Graph presentation for number of active devices in LAN networks of all school locations connected inside the AMRES school network in an arbitrarily selected time interval. ● Presentation of distribution (Categorical metric) for total number of active devices in LAN networks of all school locations connected inside the AMRES school network by categories in an arbitrarily selected time interval. Display categories must be configurable (e.g. there are no active devices in LAN network, number of devices ranging from 1 to 4, number of devices ranging from 5 to 24, number of devices ranging from 25 to 49, number of devices grater or equal of 50, total number of school that participate in distribution etc.).					

● Tabular presentation (Table View) for number of active devices in LAN networks of every school location connected inside the AMRES school network in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, minimum number of active devices in selected time interval, average number of active devices in selected time interval, maximum number of active devices in selected time interval. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.). (xiii) Continuous monitoring and display of transferred amount of data for all connected school locations of the AMRES school network ● The time-based Graph presentation for the total amount of data transferred on all school locations WAN links in AMRES school network in an arbitrarily selected time interval. The graph must display total amount of transferred data, amount of downloaded data toward the school				

locations, amount of uploaded data from school locations.

- Tabular presentation (Table View) for the total amount of data transferred on all school locations WAN links in the AMRES school network in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, total amount of transferred data (B), amount of downloaded data toward the school location (B), amount of uploaded data from school location (B) etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).

(xiv) Continuous monitoring and display of all xDSL links in AMRES school network

- Presentation of distribution (Categorical metric) for number of schools with xDSL WAN link download throughput by categories in an arbitrarily selected time interval. Display categories must be configurable (e.g. download throughput less than 20Mbps, download throughput

ranging from 20Mbps to 50Mbps, download throughput ranging from 50Mbps to 90Mbps, download throughput grater of 90Mbps etc.).

- Tabular presentation (Table View) of the traffic throughput for all AMRES school network xDSL links toward the schools in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, the maximum possible download bandwidth of the link, configured download bandwidth of the link, download bandwidth utilization percentage, the maximum possible upload bandwidth of the link, configured upload bandwidth of the link, upload bandwidth utilization percentage etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).

(xv) The map with status of CPE devices connections for all school locations inside the AMRES school network

- The GEO map with precise school location geo-coordinates that present statuses of all connected school locations in last 5

minutes from time of execution. All locations must be represented by an appropriate graphic symbol that visualize CPE device connection status for that location (e.g. no packet loss to CPE device on particular location, there is a packet loss up to 100%, there is a total (100%) packet loss to CPE device on particular location etc.). Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual school location or zooming out for simultaneous display of all school locations connected to the AMRES school network on the Republic of Serbia territory. The map must have possibility for filtering graphical display of the school locations by arbitrarily number of selected parameters such as: link type (xDSL, DF, 3G/4G etc.), a school type (e.g. primary school, vocational high school, gymnasium etc.) etc.					
(xvi) The map with WAN link configured download bandwidth for all school locations connected by xDSL links inside the AMRES school network ● The GEO map with precise school location geo-coordinates that present xDSL WAN link configured download bandwidth of all connected school locations in last 5 minutes from time of execution. All locations must be represented by an					

appropriate graphic symbol that visualize xDSL WAN link configured download bandwidth for that location. Visual status value for the link must be arbitrarily configurable (e.g. download throughput less than 20Mbps, download throughput ranging from 20Mbps to 50Mbps, download throughput ranging from 50Mbps to 90Mbps, download throughput grater of 90Mbps etc.) Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual school location or zooming out for simultaneous display of all school locations connected to the AMRES school network on the Republic of Serbia territory. The map must have possibility for filtering graphical display of school locations by arbitrarily number of selected parameters such as: link type (e.g. xDSL, DF, 3G/4G etc.), a school type (e.g. primary school, vocational high school, gymnasium etc.), link configured download bandwidth category (e.g. greater of 90Mbps, greater of 50Mbps etc.) etc.				
(xvii) The map with information about number of LAN devices for all school locations connected inside the AMRES school network				
● The GEO map with precise school location geo-coordinates that present maximum				

number of active devices in LAN networks of every school location inside the AMRES school network in an arbitrarily selected time interval. All locations must be represented by an appropriate graphic symbol that visualize maximum number of active devices in LAN network for that location. Visual status value for the status must be arbitrarily configurable (e.g. there are no active devices in LAN network, number of devices ranging from 1 to 4, number of devices ranging from 5 to 24, number of devices ranging from 25 to 49, number of devices grater or equal of 50 etc.). Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual school location or zooming out for simultaneous display of all school locations connected to the AMRES school network on the Republic of Serbia territory. The map must have possibility for filtering graphical display of school locations by arbitrarily number of selected parameters such as: link type (xDSL, DF, 3G/4G etc.), a school type (e.g. primary school, vocational high school, gymnasium etc.), number of active devices in a school location LAN network etc.				

(xviii) The map with information about transferred amount of data for all school locations in AMRES school network ● The GEO map with precise school location geo-coordinates that present the total amount of transferred data for all connected school locations in last 24 hours from time of execution. All locations must be represented by an appropriate graphic symbol that visualize the total amount of transferred data for that location. Visual status value for the school location must be arbitrarily configurable (e.g. total amount of transferred data less than 200MB, total amount of transferred data ranging from 200MB to 1GB, total amount of transferred data ranging from 1GB to 5GB, total amount of transferred data greater than 5GB etc.) Meaning of all configured statuses must be presented on the map legend. Map must have possibility for zooming in up to level of individual school location or zooming out for simultaneous display of all school locations connected to the AMRES school network on the Republic of Serbia territory. The map must have possibility for filtering graphical display of school locations by arbitrarily number of selected parameters such as: link type (xDSL, DF, 3G/4G etc.), school type (e.g. primary school, vocational high				

school, gymnasium etc.), the total amount of transferred data etc.

(xix) Continuous monitoring and display of all defined alarms in AMRES school network

- System must have possibility for alarm grouping by an arbitrary topic defined by AMRES (e.g. Ping: packet loss, CPE: memory overload etc.). System must have possibility for arbitrary defined alarm priorities for the same alarm topic (e.g. different level of priorities for incidents on links (Ping: packet loss topic group) for access, distribution and core network etc.). For every priority level System must have possibility to define severity level of alarm (warning, critical, OK etc.).

- Tabular presentation (Table View) for the currently active alarms on devices and links of the AMRES school network. The table should display next columns: alarm priority, alarm severity level, alarm duration, alarm topic, CPE device IP address, Location ID, alarm description message etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address, alarm priority, alarm severity level, alarm topic, regular expression search for alarm description message, maximum alarm

duration etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).					
● The time-based Graph presentation for the number of alarms by priority and severity levels per time unit on devices and links of the AMRES school network in an arbitrarily selected time interval.					
● Tabular presentation (Table View) of the alarms on devices and links of the AMRES school network in an arbitrarily selected time interval. The table should display next columns: alarm priority, alarm severity level, alarm duration, alarm topic, CPE device IP address, Location ID, alarm description message etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Institution ID, Location ID, CPE device IP address, alarm priority, alarm severity level, alarm topic, regular expression search for alarm description message, maximum alarm duration etc. (e.g. selection of one or more cities, selection of one or more Institution ID, simultaneous combinations of multiple filtering parameters etc.).					
xx) Review and search for dynamic assignments of private IP addresses for					

school locations connected through the network of service provider

- Tabular presentation (Table View) of mapping between assigned private IP addresses and MAC addresses of the LAN connected devices in all school locations connected to the AMRES school network via service provider in an arbitrarily selected time interval. The table should display next columns: the start time of IP address assignment, the stop time, assignment duration, CPE device IP address, MAC address of LAN device, the LAN device assigned private IP address etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, CPE device IP address, MAC address of LAN device, an arbitrarily IP prefix etc. (e.g. selection of one or more cities, selection of one or more schools, simultaneous combinations of multiple filtering parameters etc.).

- System must provide search option for unknown MAC address of LAN device based on time of the IP address assignment and private IP network prefix or explicit private IP address.

(xxi) Review and search for CGNAT private to public IP address translations for school

locations connected through the network of service provider				

- Tabular presentation (Table View) of mapping between assigned private IP addresses and translated public IP addresses on the central router of the AMRES school network for the school locations connected through the network of service provider in an arbitrarily selected time interval. The table should display next columns: time of translation action, translation action (e.g. allocation, release), device private IP address, allocated public IP address, allocated port range etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device private IP address, allocated public IP address, translation action (e.g. allocation, release) etc.

- System must provide search option for unknown private IP address of device based on selected time period and selected precise translation time and known public IP address and used port.

(xxii) Collection and review of the operational log messages for devices in AMRES school network

- Presentation of the number of operational log messages by standard categories for

devices in AMRES school network in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of operational log messages per time unit by categories for devices in AMRES school network in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages by category selected on the graph. ● Tabular presentation (Table View) of operational log messages for devices in AMRES school network in an arbitrarily selected time interval. The table should display next columns: log message receive time, severity of operational log message, log message etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, name of school, Location ID, CPE device IP address, severity of operational log message, regular expression search for operational log message etc. (e.g. selection of one or more cities, selection of one or more Location ID, simultaneous combinations of multiple filtering parameters etc.). **The AMRES network central location monitoring requirements** **New features requirements**					

Continuous monitoring and display of work for the AMRES IP/MPLS core network central router devices ● The presentation of AMRES IP/MPLS network central router uptime, percentage of current CPU load usage, percentage of currently used memory, maximum temperature of the device components, statuses of BGP sessions to the arbitrarily selected internal or external neighbouring routers, current router power supplies statuses, current router fan tray status, number of alarm on all optical transceivers, existence of chasses alarms etc. ● The time-based Graph presentation for percentage of CPU load on the AMRES IP/MPLS core network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of used memory on the AMRES IP/MPLS core network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for power supplies statuses on the AMRES IP/MPLS core network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for electrical power consumption on the AMRES IP/MPLS core network central				

routers in an arbitrarily selected time interval.					
● The time-based Graph presentation for fan tray status on the AMRES IP/MPLS core network central routers in an arbitrarily selected time interval.					
● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the central routers of the AMRES IP/MPLS network in an arbitrarily selected time interval.					
● The time-based Graph presentation for ping round-trip time of the central routers of the AMRES IP/MPLS network in an arbitrarily selected time interval. The graph should display the central router response time for test ICMP traffic generated from the System.					
● The time-based Graph presentation for statuses of all relevant interfaces of the central routers of the AMRES IP/MPLS network in an arbitrarily selected time interval. The graph must display operational and administrative status for all relevant interfaces of the AMRES central routers.					
● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the AMRES					

IP/MPLS network central routers in an arbitrarily selected time interval. The graph must display data traffic and packet volumes per second in input and output direction for all relevant interfaces of the AMRES central router. ● The time-based Graph presentation for errors volumes statistics of all relevant interfaces of the AMRES IP/MPLS network central routers in an arbitrarily selected time interval. The graph must display errors volumes per second in input and output direction for all relevant interfaces of the AMRES central router. ● Tabular presentation (Table View) for current statuses of all relevant interface optical transceivers of the AMRES IP/MPLS network central routers. The table must display next columns: interface name, optical transceiver temperature, transmitting signal optical power, receiving signal optical power, the optical transceiver alarms etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc. ● Tabular presentation (Table View) for components inventory of the AMRES IP/MPLS network central routers. The table must display next columns: device name, device loopback IP address, name of				

the device component, device component description, device component model, device component serial number, device component status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc.

- Tabular presentation (Table View) for relevant interfaces of the AMRES IP/MPLS network central routers. The table must display next columns: device name, device loopback IP address, name of the device interface, interface description, current interface status, interface maximum transmission unit (MTU), interface MAC address, interface IP address etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc.

- The time-based Graph presentation for percentage of CPU load for all components of the AMRES IP/MPLS network central routers in an arbitrarily selected time interval.

- Tabular presentation (Table View) for BGP sessions statuses for to the arbitrarily selected internal or external neighbouring routers of the AMRES IP/MPLS network central routers. The table must display next columns: BGP peer IP address, BGP peer

autonomous system number, BGP session status, BGP session type, elapsed time from last BGP session status change, number of active prefixes, number of received prefixes, number of accepted prefixes etc. ● The time-based Graph presentation of BGP session statuses for to the arbitrarily selected internal or external neighbouring routers of the AMRES IP/MPLS network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of received prefixes via BGP sessions for to the arbitrarily selected internal or external neighbouring routers of the AMRES IP/MPLS network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of accepted prefixes via BGP sessions for to the arbitrarily selected internal or external neighbouring routers of the AMRES IP/MPLS network central routers in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of active prefixes accepted via BGP sessions for to the arbitrarily selected internal or external neighbouring routers of the AMRES IP/MPLS network central				

routers in an arbitrarily selected time interval.

● Tabular presentations (Table Views) for BGP sessions statuses as well as time-based graphs that display statuses of BGP sessions and different statistics for BGP prefixes must have possibility for filtering by arbitrarily number of selected parameters such as: name of device, device IP address, BGP peer type, BGP peer AS, BGP peer ID, BGP peer IP address etc. (e.g. selection of one or more devices names, selection of one or more BGP peer AS, simultaneous combinations of multiple filtering parameters etc.).

● Tabular presentation (Table View) for LDP sessions statuses for the neighbouring routers of the AMRES MPLS network central routers. The table must display next columns: local router IP address, neighbour IP address, LDP session ID, LDP session state, LDP session connection, LDP session uptime etc.

● The time-based Graph presentation of LDP session states for the neighbouring routers of the AMRES MPLS network central routers in an arbitrarily selected time interval.

● Tabular presentation (Table View) for ISIS sessions statuses for the neighbouring routers of the AMRES MPLS network

central routers. The table must display next columns: local router IP address, local router interface, neighbour IP address, neighbour router hostname, ISIS session state, ISIS session uptime etc.

● The time-based Graph presentation of ISIS session states for the neighbouring routers of the AMRES MPLS network central routers in an arbitrarily selected time interval.

● Presentation of the number of operational log messages by standard categories for the AMRES IP/MPLS network central routers in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of operational log messages per second by categories the AMRES IP/MPLS network central routers in an arbitrarily selected time interval.

Existing System features

(xxiii) Continuous monitoring and display of work for CGNAT service at the AMRES school network central location

● Presentation for percentage of CGNAT public IP address pools usage, percentage of CGNAT port usage, percentage of CGNAT port block usage, total number of

CGNAT hits per second, total number of current CGNAT sessions etc. ● The time-based Graph presentation for number of used ports by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for number of used port blocks by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for number of unique pool users by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for number of sessions by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for number of CGNAT pool translation hits by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of used ports by used IP address pool in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of used port blocks by used IP address pool in an arbitrarily selected time interval.					

● Presentation for public IP addresses pool names, pool address range, total number of port blocks for assignment, total number of ports for assignment etc. (xxiv) Continuous monitoring and display of work for Web security appliance (WSA) devices at the AMRES school network central location ● Presentation for power supplies statuses, fan statuses, current temperature, license key expiration for all WSA devices at the AMRES school network central location. ● The time-based Graph presentation of temperature for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of CPU load for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display percentage of CPU load by system process, percentage of CPU load by client requests, percentage of CPU idle time etc. ● The time-based Graph presentation for percentage of system load for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval.				

● The time-based Graph presentation for percentage of RAM and SWAP memory usage for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval.					
● The time-based Graph presentation for total interfaces traffic for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display input and output traffic for all relevant devices' interfaces (P1, management interface).					
● The time-based Graph presentation for cache client device side statistics for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display cache client requests, cache client accepts, cache client errors, cache client hits, cache client request misses etc.					
● The time-based Graph presentation for cache client device side connections for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display cache client total connections and cache client idle connections.					
● The time-based Graph presentation for cache client device side traffic for all WSA devices at the AMRES school network central location in an arbitrarily selected					

time interval. The graph must display cache client output traffic and cache client input traffic per WSA device.

- The time-based Graph presentation for connections the WSA device keeps open with external servers for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display cache server sockets, cache server requests, cache server total connections, cache server errors, cache server idle connections etc.

- The time-based Graph presentation for cache server device side traffic for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display cache server output traffic and cache server input traffic per WSA device.

- The time-based Graph presentation for SSL statistics for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval. The graph must display SSL jobs per second and SSL connections per second for all WSA devices.

- Tabular presentation (Table View) for HTTP request test results for arbitrarily configured web URL addresses for all WSA devices at the AMRES school

network central location. The table should display next columns: web URL address request time, web URL address, response time, response HTTP code, test result code etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: name of WSA device, WSA device IP address.

- The time-based Graph presentations for HTTP test response time for arbitrarily configured web URL addresses for all WSA devices at the AMRES school network central location in an arbitrarily selected time interval.

- All graphs must have possibility to simultaneously display relevant parameters for one or more selected WSA devices and presentation filtering by an arbitrarily selected parameter such as name of the WSA device, device IP address etc. (e.g. selection of one or more device names etc.).

(xxv) Continuous monitoring and display of work for the AMRES school network central router device

- The presentation of AMRES school network central router uptime, percentage of current CPU load usage, percentage of currently used memory, percentage of current device load, maximum temperature of the device components,

statuses of BGP sessions to the primary and backup router in the network of service provider etc.

- The time-based Graph presentation for percentage of CPU load on the AMRES school network central router in an arbitrarily selected time interval.

- The time-based Graph presentation for percentage of used memory on the AMRES school network central router in an arbitrarily selected time interval.

- The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the central router of the AMRES school network in an arbitrarily selected time interval.

- The time-based Graph presentation for ping round-trip time of the central router of the AMRES school network in an arbitrarily selected time interval. The graph should display the central router response time for test ICMP traffic generated from the System.

- The time-based Graph presentation for statuses of all relevant interfaces of the central router of the AMRES school network in an arbitrarily selected time interval. The graph must display operational and administrative status for

all relevant interfaces of the AMRES central router.

- The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the AMRES school network central router in an arbitrarily selected time interval. The graph must display data traffic and packet volumes per second in input and output direction for all relevant interfaces of the AMRES central router.

- Tabular presentation (Table View) for current statuses of all relevant interface optical transceivers of the AMRES school network central router. The table must display next columns: interface name, optical transceiver temperature, transmitting signal optical power, receiving signal optical power, the optical transceiver alarms etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc.

- Tabular presentation (Table View) for components inventory of the AMRES school network central router. The table must display next columns: device loopback IP address, name of the device component, device component description, device component model, device component serial number, device

component status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc. ● Tabular presentation (Table View) for relevant interfaces of the AMRES school network central router. The table must display next columns: device loopback IP address, name of the device interface, interface description, interface maximum transmission unit (MTU), interface MAC address, interface IP address etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: device IP address, device name etc. ● The time-based Graph presentation for percentage of CPU load for all components of the AMRES school network central router in an arbitrarily selected time interval. ● Tabular presentation (Table View) for BGP sessions statuses for primary and backup routers of AMRES school network service provider and other routers in AMRES central location. The table must display next columns: BGP peer IP address, BGP peer autonomous system number, BGP session status, BGP session type, elapsed time from last BGP session status change, number of active prefixes,				

number of received prefixes, number of accepted prefixes etc.

● The time-based Graph presentation of BGP session statuses for service provider primary and backup routers and other routers in AMRES central location in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of received prefixes via BGP sessions for service provider primary and backup routers and other routers in AMRES central location in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of accepted prefixes via BGP sessions for service provider primary and backup routers and other routers in AMRES central location in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of active prefixes accepted via BGP sessions for service provider primary and backup routers and other routers in AMRES central location in an arbitrarily selected time interval.

● Tabular presentations (Table Views) for BGP sessions statuses as well as time-based graphs that display statuses of BGP sessions and different statistics for BGP prefixes must have possibility for filtering

by arbitrarily number of selected parameters such as: name of device, device IP address, BGP peer type, BGP peer AS, BGP peer ID, BGP peer IP address etc. (e.g. selection of one or more devices names, selection of one or more BGP peer AS, simultaneous combinations of multiple filtering parameters etc.).

● Presentation of the number of operational log messages by standard categories for the central router of the AMRES school network in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of operational log messages per second by categories for the central router of the AMRES school network in an arbitrarily selected time interval.

(xxvi) Continuous monitoring and display of work for the AMRES school network central firewall device

● Presentation of current CPU load percentage for the central firewall of the AMRES school network, percentage of currently used memory, current hard disk usage, number of active sessions on the device, number of existing virtual domains etc.

● The time-based Graph presentation for percentage of CPU load on the central

firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for percentage of used memory on the central firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for percentage of hard disk usage on the central firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for active sessions on the central firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the central firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for ping round-trip time of the central firewall of the AMRES school network in an arbitrarily selected time interval. The graph should display the central firewall response time for test ICMP traffic generated from the System.				
● The time-based Graph presentation for statuses of all relevant interfaces of the				

central firewall of the AMRES school network in an arbitrarily selected time interval. The graph must display operational and administrative status for all relevant interfaces of the AMRES central firewall.

● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the AMRES central school network firewall in an arbitrarily selected time interval. The graph must display data traffic per second in input and output direction for all relevant interfaces of the AMRES central firewall.

● The time-based Graph presentation for number of virus transmissions detected per virtual domain per second and number of virus transmissions blocked per virtual domain per second.

● The time-based Graph presentation for number of intrusions in every firewall virtual domain per second in an arbitrarily selected time interval. Graph must present number of intrusions detected per virtual domain per second and number of intrusions blocked per virtual domain per second.

● The time-based Graph presentation for number of detected intrusions per severity

in every firewall virtual domain per second in an arbitrarily selected time interval.				
● The time-based Graph presentation for number of detected intrusions per type in every firewall virtual domain per second in an arbitrarily selected time interval. Graph must present number of intrusions detected by signature per virtual domain per second and number of intrusions detected as anomalies per virtual domain per second.				
● The time-based Graph presentation for number of blocked P2P connections in every firewall virtual domain per second in an arbitrarily selected time interval.				
● Presentation of the number of operational log messages by standard categories for the central firewall of the AMRES school network in an arbitrarily selected time interval.				
● The time-based Graph presentation for the number of operational log messages per second by categories for the central firewall of the AMRES school network in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages per second by category selected on the graph.				
● All graphs must have possibility to simultaneously display relevant				

parameters for one or more AMRES central firewall virtual domains and presentation filtering by an arbitrarily selected parameter such as name of the firewall, IP firewall address, name of the virtual domain etc. (e.g. selection of one or more virtual domain names etc.). (xxvii) Continuous monitoring and display of work for the AMRES school network central DDoS protection system ● Presentation of current CPU load percentage, percentage of currently used physical and swap space memory, current hard disk usage for all components of the AMRES school network central DDoS protection system, components uptime, number of flows per second for NetFlow collector component of central DDoS protection system etc. ● The time-based Graph presentation for percentage of CPU load for all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of used physical and swap space memory for all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval.				

- The time-based Graph presentation for percentage of hard disk usage for all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval.

- The time-based Graph presentation for number of flows per second for NetFlow collector component of the AMRES school network central DDoS protection system in an arbitrarily selected time interval.

- The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval.

- The time-based Graph presentation for ping round-trip time of all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval. The graph should display the components response time for test ICMP traffic generated from the System.

- The time-based Graph presentation for statuses of all relevant interfaces of all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval. The graph must display operational and

administrative status for all relevant interfaces of all components of the AMRES school network central DDoS protection system.				
● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval. The graph must display data traffic per second in input and output direction for all relevant interfaces of all components of the AMRES school network central DDoS protection system.				
● Presentation of the number of operational log messages by standard categories for all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval.				
● The time-based Graph presentation for the number of operational log messages per second by categories for all components of the AMRES school network central DDoS protection system in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages per second by category selected on the graph.				
● All graphs must have possibility to simultaneously display relevant parameters for one or more components of				

the AMRES school network central DDoS protection system and presentation filtering by an arbitrarily selected parameter such as name of the component, IP address of component etc. (e.g. selection of one or more component names etc.).

(xxviii) Continuous monitoring and display of work for the ADC devices for WSA devices traffic load balancing in the central location of AMRES school network

● Presentation of current CPU load percentage, percentage of currently used memory, current system load, the air temperature of the device, fan tray status, power supply unit status etc.

● The time-based Graph presentation for percentage of CPU load for the ADC devices in an arbitrarily selected time interval.

● The time-based Graph presentation for percentage of used memory for the ADC devices in an arbitrarily selected time interval.

● The time-based Graph presentation for percentage of system load for the ADC devices in an arbitrarily selected time interval.

● The time-based Graph presentation for temperature of the ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for fan tray status of the ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for power supply unit status of the ADC devices in an arbitrarily selected time interval.	
● Presentation of high-availability (HA) mode for the ADC devices, number of peers, last changed status time of HA mode, last changed status reason of HA mode etc.	
● Tabular presentation (Table Views) of all ADC peers in HA mode. The table should display next columns: the node ID of the peer, status of the peer, the IP address of the peer, the name of ADC device etc.	
● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for ping round-trip time of the ADC devices in an arbitrarily selected time interval. The graph should display the ADC devices	

response time for test ICMP traffic generated from the System.

● The time-based Graph presentation for statuses of all relevant interfaces of the ADC devices in an arbitrarily selected time interval. The graph must display operational and administrative status for all relevant interfaces of the ADC devices.

● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the ADC devices in an arbitrarily selected time interval. The graph must display data traffic per second in input and output direction for all relevant interfaces of the ADC devices.

● Presentation of the number of operational log messages by standard categories for the ADC devices in an arbitrarily selected time interval.

● The time-based Graph presentation for the number of operational log messages per second by categories for the ADC devices in an arbitrarily selected time interval. The graph must have possibility for filtering and display of the number of operational log messages per second by category selected on the graph.

● Tabular presentation (Table Views) of all configured virtual servers on the ADC devices. The table should display next

columns: name of ADC device, a virtual server name, the virtual server status, the virtual server health, the virtual domain of the specified virtual server etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: name or IP address of the ADC device, name of the virtual domain, the virtual server IP address, the virtual server name etc. (e.g. selection of one or more virtual domains, selection of one or more virtual servers, simultaneous combinations of multiple filtering parameters etc.).

- The time-based Graph presentation for number of new connections per second of all virtual servers of ADC devices in an arbitrarily selected time interval.

- The time-based Graph presentation for the concurrent connection rate of all virtual servers of ADC devices in an arbitrarily selected time interval.

- The time-based Graph presentation for the throughput rate of all virtual servers of ADC devices in an arbitrarily selected time interval.

- The time-based Graph presentation for number of client-side connections per second of all ADC devices in an arbitrarily selected time interval.

● The time-based Graph presentation for number of client-side requests per second of all ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for number of client-side SSL connections per second of all ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for number of client-side SSL requests per second of all ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for number of client-side total throughput of all ADC devices in an arbitrarily selected time interval.	
● The time-based Graph presentation for number of client-side SSL throughput of all ADC devices in an arbitrarily selected time interval.	
● All graphs must have possibility to simultaneously display relevant parameters for one or more ADC devices and presentation filtering by an arbitrarily selected parameter such as a name or an IP address of the ADC device, name of the virtual domain, the virtual server IP address, the virtual server name etc. (e.g. selection of one or more virtual domains, selection of one or more virtual servers,	

simultaneous combinations of multiple filtering parameters etc.). **The school locations in the AMRES school network monitoring requirements** **New features requirements** (xxix) Continuous monitoring and display of key performance indicators for all LAN switches inside the AMRES school network installed through the Project "Connected schools" - Tabular presentation (Table View) of the LAN switches status for the selected school location inside the AMRES school network for the previous 10 minutes from the moment of execution. The table should display next columns: LAN switch IP address, LAN switch hostname, city, name of school, Institution ID, Location ID, link type, response time, packet loss percentage, link status, switch model etc. - Tabular presentation (Table View) of the LAN switch availability for the selected school location inside the AMRES school network in an arbitrarily selected time interval. The table should display next columns: LAN switch hostname, LAN switch IP address, city, name of school, Institution ID, Location ID, link type, availability percentage etc.				

● Presentation of LAN switches uptime for selected school location, percentage of current CPU load usage, percentage of currently used memory, current power supply status, current fans status etc.				
● The time-based Graph presentation of LAN switch CPU load percentage for the selected school location in an arbitrarily selected time interval for all installed switches.				
● The time-based Graph presentation for percentage of LAN switch used memory for the selected school location in an arbitrarily selected time interval for all installed switches.				
● The time-based Graph presentation of LAN switch power supply status for the selected school location in an arbitrarily selected time interval for all installed switches.				
● The time-based Graph presentation for percentage of LAN switch fans status for the selected school location in an arbitrarily selected time interval for all installed switches.				
● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the LAN switch of the selected				

school location in an arbitrarily selected time interval for all installed switches.

● The time-based Graph presentation for ping round-trip time of the LAN switch of the selected school location in an arbitrarily selected time interval for all installed switches. The graph should display the LAN switch response time for test ICMP traffic generated from the System.

● The time-based Graph presentation for statuses of all relevant interfaces of the LAN switch of the selected school location in an arbitrarily selected time interval for all installed switches. The graph must display operational and administrative status for all relevant interfaces of the LAN switch.

● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the LAN switch of the selected school location in an arbitrarily selected time interval for all installed switches. The graph must display data traffic and packet volumes per second in input and output direction for all relevant interfaces of the LAN switch.

● Tabular presentation (Table View) of the configured alarms on LAN switches of the selected school location in an arbitrarily selected time interval. The table should

display next columns: alarm priority, alarm severity level, alarm duration, alarm topic, LAN switch IP address, LAN switch hostname, Location ID, alarm description message etc. ● The time-based Graph presentation for the number of alarms by priority and severity levels per time unit on the LAN switches of the selected school location in an arbitrarily selected time interval. ● Presentation of total number of currently active devices in LAN network of selected school location connected inside the AMRES school network per defined VLAN. ● The time-based Graph presentation for number of active devices in LAN network of selected school location connected inside the AMRES school network in an arbitrarily selected time interval per defined VLAN. ● Tabular presentation (Table View) for basic information about installed LAN switches at the selected school location. The table must display next columns: hostname, device loopback IP address, city, the school name, device description, device model, device serial number, operating system software version, firmware version etc.					

● Tabular presentation (Table View) for components inventory of the LAN switches at the selected school location. The table must display next columns: device loopback IP address, device hostname, city, the school name, name of the device component, device component description, device component model, device component serial number etc. ● Tabular presentation (Table View) for relevant interfaces of the LAN switch at the selected school location for all installed switches. The table must display next columns: device loopback IP address, hostname, city, the school name, name of the device interface, interface description, interface status, interface MAC address, interface traffic statistics etc. ● Presentation of the number of operational log messages by standard categories for the selected school location. in an arbitrarily selected time interval for all installed LAN switches. ● The time-based Graph presentation for the number of operational log messages per time unit by categories for the LAN switches at the selected school location in an arbitrarily selected time interval. ● Tabular presentation (Table View) of operational log messages for the LAN switches at the selected school location in					

an arbitrarily selected time interval. The table should display next columns: log message receive time, severity of operational log message, log message etc.

Existing System features

(xxx) Continuous monitoring and display of key performance indicators for the WAN links and CPE devices of all school locations connected to the AMRES school network

- Tabular presentation (Table View) of the CPE device status for the selected school location inside the AMRES school network for the previous 10 minutes from the moment of execution. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, response time, packet loss percentage, link status etc.

- Tabular presentation (Table View) of the CPE device availability for the selected school location inside the AMRES school network in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, availability percentage etc.

- Tabular presentation (Table View) of the link quality for the selected school location inside the AMRES school network in an arbitrarily selected time interval. The table

should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, link type, number of measurement samples in which link had packet loss, percentage of time in which link had a packet loss, average percentage of packet loss in time intervals with the packet loss etc. ● Presentation of CPE router uptime for selected school location, percentage of current CPU load usage, percentage of currently used memory etc. ● The time-based Graph presentation of CPU load percentage for the selected school location in an arbitrarily selected time interval. ● The time-based Graph presentation of percentage of used memory for the selected school location in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the CPE router of the selected school location in an arbitrarily selected time interval. ● The time-based Graph presentation for ping round-trip time of the CPE router of the selected school location in an arbitrarily selected time interval. The				

graph should display the CPE router response time for test ICMP traffic generated from the System.

● Presentation of the total amount of data transferred in download and upload direction for the selected school location in an arbitrarily selected time interval.

● The time-based Graph presentation for statuses of all relevant interfaces of the CPE router of the selected school location in an arbitrarily selected time interval. The graph must display operational and administrative status for all relevant interfaces of the CPE router.

● The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the CPE router of the selected school location in an arbitrarily selected time interval. The graph must display data traffic and packet volumes per second in input and output direction for all relevant interfaces of the CPE router.

● Tabular presentation (Table View) of the alarms on CPE device and WAN link of the selected school location in an arbitrarily selected time interval. The table should display next columns: alarm priority, alarm severity level, alarm duration, alarm topic, CPE device IP

address, Location ID, alarm description message etc.

- The time-based Graph presentation for the number of alarms by priority and severity levels per time unit on the CPE device and WAN link of the selected school location in an arbitrarily selected time interval.

- Tabular presentation (Table View) of mapping between assigned private IP addresses and MAC addresses of the LAN connected devices in the selected school location connected to the AMRES school network via service provider in an arbitrarily selected time interval. The table should display next columns: the start time of IP address assignment, the stop time, assignment duration, CPE device IP address, MAC address of LAN device, the LAN device assigned private IP address etc.

- Tabular presentation (Table View) of the traffic throughput for the selected school location connected to the AMRES school network via xDSL link in an arbitrarily selected time interval. The table should display next columns: CPE device IP address, city, name of school, Institution ID, Location ID, the maximum possible download bandwidth of the link, configured download bandwidth of the link, download bandwidth utilization percentage, the maximum possible upload

bandwidth of the link, configured upload bandwidth of the link, upload bandwidth utilization percentage etc.

- The time-based Graphs presentation for maximum possible bandwidth of the WAN link and configured bandwidth of the WAN link for the selected school location connected to the AMRES school network via xDSL line in an arbitrarily selected time interval. The Graphs should display the maximum possible download bandwidth of the link and configured download bandwidth of the link as well as the maximum possible upload bandwidth of the link and configured upload bandwidth of the link.

- Presentation of total number of currently active devices in LAN network of selected school location connected inside the AMRES school network.

- The time-based Graph presentation for number of active devices in LAN network of selected school location connected inside the AMRES school network in an arbitrarily selected time interval.

- Tabular presentation (Table View) of currently active devices in LAN network of the selected school location. The table should display next columns: the active LAN device assigned private IP address,

	the active LAN device MAC address, last info update time etc. ● Tabular presentation (Table View) for basic information about installed CPE device at the selected school location. The table must display next columns: device loopback IP address, city, the school's name, device description, device model, device serial number, operating system software version etc. ● Tabular presentation (Table View) for components inventory of the CPE router at the selected school location. The table must display next columns: device loopback IP address, city, the school's name, name of the device component, device component description, device component model, device component serial number etc. ● Tabular presentation (Table View) for relevant interfaces of the CPE router at the selected school location. The table must display next columns: device loopback IP address, city, the school's name, name of the device interface, interface description, interface maximum transmission unit (MTU), interface MAC address, interface IP address etc. ● Tabular presentation (Table View) of the IP routing table for the CPE router at the selected school location. The table must				

display next columns: device loopback IP address, city, the school's name, route network prefix, route network mask, next hop IP address etc.

- Presentation of the number of operational log messages by standard categories for the selected school location. in an arbitrarily selected time interval.

- The time-based Graph presentation for the number of operational log messages per time unit by categories for the CPE device at the selected school location in an arbitrarily selected time interval.

- Tabular presentation (Table View) of operational log messages for the CPE device at the selected school location in an arbitrarily selected time interval. The table should display next columns: log message receive time, severity of operational log message, log message etc.

- The time-based Graphs presentation of traffic structure on the WAN link of the selected school location presented by bits per second (bps), packet per second (pps) and flows per second (fps) for top 20 LAN devices in an arbitrarily selected time interval.

- The time-based Graphs presentation of IP protocols traffic structure on the WAN link of the selected school location presented

by bits per second (bps), packet per second (pps) and flows per second (fps) for top 10 protocols in an arbitrarily selected time interval.

- The time-based Graphs presentation of TCP/UDP ports traffic structure on the WAN link of the selected school location presented by bits per second (bps), packet per second (pps) and flows per second (fps) for top 10 TCP/UDP ports in an arbitrarily selected time interval.

The AMRES IP/MPLS backbone network monitoring requirements

New feature requirements

(xxxi) Continuous monitoring and display of key performance indicators for the AMRES IP/MPLS core network devices

- The presentation of AMRES IP/MPLS network core router uptime, percentage of current CPU load usage, percentage of currently used memory, statuses of BGP sessions to the arbitrarily selected internal or external neighbouring routers, current router power supplies statuses, current router fan tray status, number of alarm on all optical transceivers, existence of chasses alarms etc.

- The time-based Graph presentation for percentage of CPU load on the AMRES

IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of used memory on the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for power supplies statuses on the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for fan tray status on the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for percentage of packet loss for test ICMP traffic generated from the System (ping) toward the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for ping round-trip time of the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. The graph should display response time for test ICMP traffic generated from the System. ● The time-based Graph presentation for statuses of all relevant interfaces of the AMRES IP/MPLS core network router in an arbitrarily selected time interval. The				

graph must display operational and administrative status for all relevant interfaces of the routers.

- The time-based Graph presentation for data traffic and packet volumes statistics of all relevant interfaces of the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. The graph must display data traffic and packet volumes per second in input and output direction for all relevant interfaces of the router.

- The time-based Graph presentation for errors volumes statistics of all relevant interfaces of the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. The graph must display errors volumes per second in input and output direction for all relevant interfaces of the router.

- Tabular presentation (Table View) for current statuses of all relevant interface optical transceivers of the AMRES IP/MPLS core network routers. The table must display next columns: interface name, optical transceiver temperature, transmitting signal optical power, receiving signal optical power, the optical transceiver alarms etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters

such as: city, AMRES PoP institution name, device IP address, device name etc. ● Tabular presentation (Table View) for components inventory of the AMRES IP/MPLS core network routers. The table must display next columns: device name, device loopback IP address, name of the device component, device component description, device component model, device component serial number, device component status etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, AMRES PoP institution name device IP address, device name etc. ● Tabular presentation (Table View) for relevant interfaces of the AMRES IP/MPLS core network routers. The table must display next columns: device name, device loopback IP address, name of the device interface, interface description, current interface status, interface maximum transmission unit (MTU), interface MAC address, interface IP address etc. The presentation must have possibility for filtering by arbitrarily number of selected parameters such as: city, AMRES PoP institution name, device IP address, device name etc. ● The time-based Graph presentation for percentage of CPU load for all components of the AMRES IP/MPLS core network				

routers in an arbitrarily selected time interval. ● Tabular presentation (Table View) for BGP sessions statuses to the AMRES RR neighbouring routers of the AMRES IP/MPLS core network routers. The table must display next columns: BGP peer IP address, BGP peer autonomous system number, BGP session status, BGP session type, elapsed time from last BGP session status change, number of active prefixes, number of received prefixes, number of accepted prefixes etc. ● The time-based Graph presentation of BGP session statuses to the AMRES RR neighbouring routers of the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of received prefixes via BGP sessions to the AMRES RR neighbouring routers of the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● The time-based Graph presentation for the number of accepted prefixes via BGP sessions from the AMRES RR neighbouring routers for the AMRES IP/MPLS core network routers in an arbitrarily selected time interval.				

● The time-based Graph presentation for the number of active prefixes accepted via BGP sessions from the AMRES RR neighbouring routers for the AMRES IP/MPLS core network routers in an arbitrarily selected time interval. ● Tabular presentations (Table Views) for BGP sessions statuses as well as time-based graphs that display statuses of BGP sessions and different statistics for BGP prefixes must have possibility for filtering by arbitrarily number of selected parameters such as: city, AMRES institution name, name of device, device IP address, BGP peer type, BGP peer AS, BGP peer ID, BGP peer IP address etc. (e.g. selection of one or more devices names, selection of one or more BGP peer AS, simultaneous combinations of multiple filtering parameters etc.). ● Tabular presentation (Table View) for LDP sessions statuses for the neighbouring routers of the AMRES MPLS core network routers. The table must display next columns: local router IP address, neighbour IP address, LDP session ID, LDP session state, LDP session connection, LDP session uptime etc. ● The time-based Graph presentation of LDP session states for the neighbouring routers of the AMRES MPLS core				

network routers in an arbitrarily selected
time interval.

- Tabular presentation (Table View) for
ISIS sessions statuses for the neighbouring
routers of the AMRES MPLS core
network routers. The table must display
next columns: local router IP address, local
router interface, neighbour IP address,
neighbour router hostname, ISIS session
state, ISIS session uptime etc.

- The time-based Graph presentation of ISIS
session states for the neighbouring routers
of the AMRES MPLS core network
routers in an arbitrarily selected time
interval.

- Presentation of the number of operational
log messages by standard categories for
the AMRES IP/MPLS core network
routers in an arbitrarily selected time
interval.

- The time-based Graph presentation for the
number of operational log messages per
second by categories the AMRES
IP/MPLS core network routers in an
arbitrarily selected time interval.

**Description of network devices and systems
used in AMRES network**

System should be compatible with and
able to monitor the following devices
models used in AMRES network:

● System should run on the virtualized server infrastructure based on VMware vSphere 6.5 or newer. ● Central firewall system – Fortinet firewall FortiGate 7060E, management appliance FortiManager and Log management appliance FortiAnalyzer. ● Central system for web traffic security – Cisco Web Security Appliances Cisco WSA S695F and WSA-S690-10G-K9 and central management system Cisco SMA M695F and M690, Fortinet Aplication Delivery Controller (ADC) system with 2 FortiADC FAD-4000F devices in Active/Standby HA cluster ● Central router for connectivity with external networks – Juniper MX960 with CGNAT feature (Multiservices MS-MPC) ● Central system for DDoS protection – NETSCOUT Arbor Sightline SP-FXP-CORE-1 server with physical appliance for traffic scrubbing Arbor Threat Mitigation System TMC-HD1000-20G-AC. ● IP/MPLS core network devices - Juniper MX960, MX480, MX5, MX10, MX80, MX104, MX10003, ACX2200, MX304, ACX7024, EX2200, EX2300 etc. ● CPE routers at the school's locations:					

○ Cisco devices – router models C891FW-E-K9, CISCO867VAE, C1111-8PWE ○ Huawei – router models AR611W, AR617VW, AR109GW-L ○ MikroTik – router models RB2011UiAS-RM, RB3011UiAS-RM ○ D-link – router model D-link DWR-921 ● LAN switches at the school's locations: ○ Cisco devices – C9200L-24P-4G-E, Cisco Catalyst 9200L 24G PoE+ 4 SFP+ 370W ○ Aruba - Aruba 2930F 48G PoE+ 4SFP 740W Switch (JL557A) ● Inventory of the AMRES School network will be provided to the supplier in the CSV format, which includes following information: School name, School Address, City, Institution ID, Location ID, IP address of CPE device, IP address prefix used inside the school LAN networks and Connection type, IP address for all installed LAN switch devices. ● Inventory of the AMRES IP/MPLS network will be provided to the supplier in the CSV format, which includes following information: AMRES institution name, AMRES institution Address, City, IP address of AMRES IP/MPLS device, IP				

address prefix used inside the AMRES institution etc.

Delivery of the system

- System installation on the server's infrastructure provided by AMRES

- Configuration of the system according to the requests defined in section Initial System configuration requirements (The AMRES network global overview requirements, the AMRES network central location monitoring requirements, the school locations in the AMRES school network monitoring requirements, the AMRES IP/MPLS backbone network monitoring requirements) of this technical specification and integration with the AMRES school network infrastructure.

- System features and quality assurance testing inside the network production environment.

- System introduction in production

- Provide technical training for usage, configuration and maintenance of the system in duration of 8 working hours for the AMRES technical staff. The training will be conducted using AMRES web videoconferencing service or in the AMRES offices in Belgrade, Serbia.

- Provide technical documentation and user manuals about the provided system.

Technical support and system maintenance

The supplier should provide the following level of technical support for the period of 12 months from the day of the initial system introduction to production network:

- Access to the supplier's or vendor's technical support over email or web portal during workdays from 9.00 until 17.00
- Access to the new versions of the System's software
- Access to the System's documentation and user manuals.
- Perform the System's upgrade to the software latest version upon the AMRES request.
- Analyse, detect and resolve any operational or functional issues related to the System upon the AMRES request.
- Provide consultation services and best practice recommendations regarding configuration or usage of the system: for example, adding additional monitoring metrics, change the graphical user interface Views and metric visualizations, configuring new alarms, etc.
- Provide up to 80 hours of software development or engineering effort to add or change System's features, for example,

configuring additional monitoring metrics, configuring additional alarms, configuring additional views, etc. ● Technical support response should be provided within 2 working days. ● Communication with technical support will be provided over usual forms of communication – email, support web portal, instant messaging, phone calls, etc.					
Specification of equipment	Unit	Amount	Country of origin	Description of the offered item	Additional information
13. Installation and commissioning					
HW Installation and configuration • Required hardware management IP addresses and Operating system management IP addresses must be asked in advanced and provided by the Beneficiary. • Install FC SAN switches in rack. • Configure management IP addresses for FC switches and initialize them. • Server installation in rack. Connecting LAN, OOBM and SAN cables. • Configuring server management IP addresses. • Installing cloud operating system (hypervisor) on servers and configuring OS management IP address.	**Pcs**	**1**			

• Install Shared primary SAN Storage systems in rack. Connecting LAN, OOBM and SAN cables. • Install Backup Storage systems in rack. Connecting OOBM and SAN cables. • Configure management IP addresses and initialize all storage systems. • Configure zoning on FC switches (aliases, zones, zone-sets…). • Create LUN's (min. four LUNs per 100 GB) and configure workload hosts (server) access on storage system. • It is the Supplier responsibility to provide LLD (Low Level Design) documentation and deliver to Beneficiary in electronic form and in hard copy. **Private cloud - Virtualization software/platform installation and configuration** • Required IP addresses for all services for private cloud virtualization software/platform must be asked in advanced and provided by the Beneficiary. • It is the Supplier responsibility to install and configure all required and proposed virtualization management components.					

• Supplier will install and configure private cloud virtualization software on servers (item 1 and 2). **Installation of software for backup and replication** • Install software for backup on backup server, initialize and install required licenses. • Configure FC switch to allow access from backup server to primary and backup storage. • Configure backup storage as backup destination. • Test backup job creation and execution. **Current storage upgrade** • Install additional disk enclosures for Huawei Dorado 5000v6 SAN Storage systems in rack. • Connect backend 100Gbps cables from new enclosures with existing storage system. • Install and configure additional disks.					

4. General Technical Requirements

1. Introduction

These General Technical Requirements should be read in conjunction with the bidding document in particular with the Technical Specification.

General technical requirement shall apply to all items.
Should there be any conflict or inconsistency between the terms of these requirements and the Technical Specification Form, the Technical Specification shall prevail.

The Bidder shall be aware that supply and delivery must include all needed parts and accessories (e.g. tubing, cabling, special tools and lab-ware required for regular maintenance and operation) required for the supplies to be presented for acceptance fully installed, operational and ready for use in accordance with technical and the manufacturers' specifications.

The accessories, parts and documentation used during delivery must therefore be anticipated and included in the offered price.

All specifications and details listed within the bid for each item are the minimum requirements and any higher specification cannot be incompatible with primary performance. Any improvements on the specifications or additional features offered should be clearly identified in the Bidder's offer.

All manufacturers' technical literature supplied with the bid must match the Bidder's written specifications. Manufacturers' technical literature should be submitted for each item offered, and Bidders shall provide the necessary documentation (catalogues, guides, brochures, manuals, booklets, etc.) with detailed technical specifications of all items being offered, thus enabling the Beneficiary to verify the information provided in the offer. If the requested parameter is not stated in the official manufacturer data sheet, it is allowed to submit a manufacturer's statement or statement issued by the registered representative office of the manufacturer as a proof of the requirements given in the Technical Specification. Bidders shall be required to demonstrate that the offered specifications are responsive to the requirements given in the Technical Specification identifying model, manufacturer and country of origin of each individual item in their specifications offered.

Note: Supplier is allowed to submit catalogues, guides, brochures, manuals, booklets, etc. in electronic form (USB) or link to the manufacturer's web site.

In the specifications offered, the Bidder must clearly state the manufacturers name and the Country of origin for each item tendered.

2. Equivalency of Standards and Codes

Wherever reference is made in the technical specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the current edition or revision of the relevant shall apply, unless otherwise expressly stated. Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

The equipment offered should be manufactured in accordance to the technical specifications.

3. Electrical Specifications

Electrical power supply shall meet the following requirements. All equipment must have internal or integrated power supplies.

Single Phase 220V RMS AC ± 10% 50 Hz ± 5% with earth.

Three Phase 380V RMS AC ± 10% 50Hz ± 5% with earth.

The quality and stability of the supplied current may undergo fluctuations of ±10 %. All equipment must be suitable for direct connection to the standard power outlets in Serbia. The type of electrical outlets generally installed in Serbia is the type with 2 (two) side mounted earthling poles (Euro Plug). Electrical plugs of equipment should be compliant with the standards of use in Serbia and fit exactly. The supplier will evaluate the supplied current, the quality of the current and the fluctuations of the current and take the necessary precautions to avoid damages to the equipment.

4. Design Criteria

The use of metric units is preferred unless otherwise required by a technical specification. ISO metric or equivalents threads should be incorporated as far as practicable.

Instruments, drawings and data shall be in the metric system.

The Supplier is obliged to ensure all technical documentation and designs produced during the execution of this contract comply with national and international regulations and applicable legislation in Serbia.

PART 3 - Contract

Section VII. General Conditions of Contract

Table of Clauses

Section VII. General Conditions of Contract

1. Definitions   1.1   The following words and expressions shall have the meanings hereby assigned to them:

(a)   "Bank" means the European Investment Bank (EIB).

(b)   "Contract" means the Contract Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.

(c)   "Contract Documents" means the documents listed in the Contract Agreement, including any amendments thereto.

(d)   "Contract Price" means the price payable to the Supplier as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

(e)   "Day" means calendar day.

(f)   "Completion" means the fulfilment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.

(g)   "GCC" means the General Conditions of Contract.

(h)   "Goods" means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.

(i)   "Purchaser's Country" is the country specified in the Special Conditions of Contract (SCC).

(j)   "Purchaser" means the entity purchasing the Goods and Related Services, as specified in the **SCC.**

(k)   "Related Services" means the services incidental to the supply of the goods, such as insurance, installation, training and initial maintenance and other such obligations of the Supplier under the Contract.

(l)   "SCC" means the Special Conditions of Contract.

(m) "Subcontractor" means any natural person, private or government entity, or a combination of the above, to whom any part of the Goods to be supplied or execution of any

part of the Related Services is subcontracted by the Supplier.

(n) "Supplier" means the natural person, private or government entity, or a combination of the above, whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Contract Agreement.

(o) "The Project Site" where applicable, means the place named in the **SCC.**

2. Contract Documents

2.1 Subject to the order of precedence set forth in the Contract Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory. The Contract Agreement shall be read as a whole.

3. Fraud and Corruption

3.1 It is the Bank's policy to require that Borrowers (including beneficiaries of Bank credits and loans), as well as bidders, suppliers, contractors, and consultants under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy[12], the Bank defines, for the purposes of this provision, the terms set forth below as follows:

• defines, for the purposes of this provision, the terms set forth below as follows:

• "Corrupt Practice" is the offering, giving, receiving or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party.

• "Fraudulent Practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation.

• "Coercive Practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of any party to influence improperly the actions of a party.

• "Collusive Practice" is an arrangement between two or more parties designed to achieve an improper purpose,

---

[12] See the EIB's Anti-Fraud Policy for definitions (http://www.eib.org/en/infocentre/publications/all/anti-fraud-policy.htm) .

including influencing improperly the actions of another party

- "Theft at EIB Group premises" is the misappropriation of property belonging to another party committed within EIB Group premises

- "Obstructive Practice" is (a) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (b) acts intended to materially impede the exercise of the EIB's contractual rights of audit or access to information or the rights that any banking, regulatory or examining authority or other equivalent body of the European Union or of its Member States may have in accordance with any law, regulation or treaty or pursuant to any agreement into which the EIB has entered in order to implement such law, regulation or treaty;

- "Misuse of EIB Group resources or assets" means any illegal activity committed in the use of the EIB Group's resources or assets, either knowingly or recklessly.

- "Money Laundering" is defined in the Bank's Anti-Fraud Policy

- "Terrorist Financing" is defined in the Bank's Anti-Fraud Policy.

3.2 In pursuance of the policy as set out in EIB's Anti-Fraud Policy[13] , if it is established to the required standards[14] that a project-related party[15] has engaged in Prohibited Conduct in the course of a procurement process or implementation of a contract financed, the Bank:

- May seek appropriate remediation of the Prohibited Conduct to its satisfaction;

- May declare ineligible such project-related party to be awarded the contract

---

[13] See the EIB's Anti-Fraud Policy for definitions (http://www.eib.org/en/infocentre/publications/all/anti-fraud-policy.htm) .
[14] In accordance with the EIB's Investigation Procedures.
[15] See the EIB's Anti-Fraud Policy

- May apply appropriate contractual remedies, which may include suspension and cancellation, unless the Prohibited Conduct has been dealt with to the satisfaction of the Bank.

- May withhold the Bank's no objection to contract award and may apply appropriate contractual remedies, which may include suspension and cancellation, unless the Prohibited Conduct has been dealt with to the satisfaction of the Bank.

3.3   Furthermore, within the framework of its Exclusion Policy, the Bank may declare such project related party ineligible to be awarded a contract under any EIB project or to enter into any relationship with the Bank.

3.4   The Supplier shall permit and shall cause their agents (where declared or not), sub-contractors, subconsultants, service providers, suppliers, and personnel, to permit the Purchaser, the Bank and auditors appointed by either of them, as well as any authority or European Union Institution or body having competence under European Union law, the right to inspect and copy the books and records of the tenderer, contractor, supplier or consultant in connection with any Bank-financed contract

4. Interpretation   4.1   If the context so requires it, singular means plural and vice versa.

4.2   Incoterms

   (a)   Unless inconsistent with any provision of the Contract**,** the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.

   (b)   The terms EXW, CIP, FCA, CFR and other similar terms, when used, shall be governed by the rules prescribed in the current edition of Incoterms specified in the **SCC** and published by the International Chamber of Commerce in Paris, France.

4.3   Entire Agreement

   The Contract constitutes the entire agreement between the Purchaser and the Supplier and supersedes all communications, negotiations and agreements (whether written or oral) of the parties with respect thereto made prior to the date of Contract.

4.4   Amendment

No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party thereto.

4.5 Nonwaiver

(a) Subject to GCC Sub-Clause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.6 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5. Language
5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Purchaser, shall be written in the language specified in the **SCC.** Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified**,** in which case, for purposes of interpretation of the Contract, this translation shall govern.

5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation, for documents provided by the Supplier.

6. Joint Venture, Consortium or Association
6.1 If the Supplier is a joint venture, consortium, or association, all of the parties shall be jointly and severally liable to the Purchaser for the fulfilment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the joint venture, consortium, or association. The composition or the constitution of

the joint venture, consortium, or association shall not be altered without the prior consent of the Purchaser.

7. Eligibility	7.1	The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Subcontractor shall be deemed to have the nationality of a country if it is a citizen or constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country.
	7.2	All Goods and Related Services to be supplied under the Contract and financed by the Bank shall have their origin in Eligible Countries. For the purpose of this Clause, origin means the country where the goods have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.
8. Notices	8.1	Any notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the **SCC.** The term "in writing" means communicated in written form with proof of receipt.
	8.2	A notice shall be effective when delivered or on the notice's effective date, whichever is later.
9. Governing Law	9.1	The Contract shall be governed by and interpreted in accordance with the laws of the Purchaser's Country, unless otherwise specified in the **SCC.**
10. Settlement of Disputes	10.1	The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
	10.2	If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract. Arbitration proceedings shall be conducted in accordance with the rules of procedure **specified in the SCC.**

10.3   Notwithstanding any reference to arbitration herein,

(a)   the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and

(b)   the Purchaser shall pay the Supplier any monies due the Supplier.

11. Scope of Supply   11.1   The Goods and Related Services to be supplied shall be as specified in the Schedule of Requirements.

12. Delivery and Documents   12.1   Subject to GCC Sub-Clause 32.1, the Delivery of the Goods and Completion of the Related Services shall be in accordance with the Delivery and Completion Schedule specified in the Schedule of Requirements. The details of shipping and other documents to be furnished by the Supplier are specified in the **SCC.**

13. Supplier's Responsibilities   13.1   The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 11, and the Delivery and Completion Schedule, as per GCC Clause 12.

14. Contract Price   14.1   Prices charged by the Supplier for the Goods supplied and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in the **SCC.**

15. Terms of Payment   15.1   The Contract Price, including any Advance Payments, if applicable, shall be paid as specified in the **SCC.**

15.2   The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by invoices describing, as appropriate, the Goods delivered and Related Services performed, and by the documents submitted pursuant to GCC Clause 12 and upon fulfilment of all other obligations stipulated in the Contract.

15.3   Payments shall be made promptly by the Purchaser, but in no case later than forty five (45) days after submission of an invoice or request for payment by the Supplier, and after the Purchaser has accepted it.

15.4   The currencies in which payments shall be made to the Supplier under this Contract shall be those in which the bid price is expressed.

15.5   In the event that the Purchaser fails to pay the Supplier any payment by its due date or within the period set forth in the **SCC,** the Purchaser shall pay to the Supplier interest on the amount of such delayed payment at the rate shown in the **SCC,** for the period of

delay until payment has been made in full, whether before or after judgment or arbitrage award.

16. Taxes and Duties	16.1	For goods manufactured outside the Purchaser's Country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's Country.

16.2 For goods Manufactured within the Purchaser's country, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc, incurred until delivery of the contracted Goods to the Purchaser.

16.3 For any customs and tax exemptions, reductions, allowances or privileges available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent. All items procured under this Contract will be exempt of import duties and taxes payable on imported goods and the value added tax on locally supplied goods based on the Finance Contract concluded between the Republic of Serbia and the European Investment Bank.

17. Performance Security

17.1 If required as specified in the SCC, the Supplier shall, within twenty-eight (28) days of the notification of contract award, provide a performance security for the performance of the Contract in the amount specified in the **SCC.**

17.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

17.3 As specified in the SCC, the Performance Security, if required, shall be denominated in the currency(ies) of the Contract, or in a freely convertible currency acceptable to the Purchaser; and shall be in one of the format stipulated by the Purchaser in the **SCC,** or in another format acceptable to the Purchaser.

17.4 The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than twenty-eight (28) days following the date of Completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in the **SCC.**

18. Copyright

18.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Purchaser directly or through the Supplier by any

third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

19. Confidential Information	19.1	The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Supplier under GCC Clause 19.

19.2   The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the performance of the Contract.

19.3   The obligation of a party under GCC Sub-Clauses 19.1 and 19.2 above, however, shall not apply to information that:

(a)   the Purchaser or Supplier need to share with the Bank or other institutions participating in the financing of the Contract;

(b)   now or hereafter enters the public domain through no fault of that party;

(c)   can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or

(d)   otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

19.4   The above provisions of GCC Clause 19 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

19.5   The provisions of GCC Clause 19 shall survive completion or termination, for whatever reason, of the Contract.

20. Subcontracting	20.1	The Supplier shall notify the Purchaser in writing of all subcontracts awarded under the Contract if not already specified in

the bid. Such notification, in the original bid or later shall not relieve the Supplier from any of its obligations, duties, responsibilities, or liability under the Contract.

20.2 Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.

21. Specifications and Standards

21.1 Technical Specifications and Drawings

(a) The Goods and Related Services supplied under this Contract shall conform to the technical specifications and standards mentioned in Section VI, Schedule of Requirements and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the Goods' country of origin.

(b) The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designed by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Purchaser.

(c) Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Schedule of Requirements. During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Purchaser and shall be treated in accordance with GCC Clause 32.

22. Packing and Documents

22.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

22.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the **SCC,** and in any other instructions ordered by the Purchaser.

23. Insurance 23.1 Unless otherwise specified in the **SCC,** the Goods supplied under the Contract shall be fully insured—in a freely convertible currency from an eligible country—against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the **SCC.**

24. Transportation 24.1 Unless otherwise specified in the **SCC,** responsibility for arranging transportation of the Goods shall be in accordance with the specified Incoterms.

25. Inspections and Tests 25.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified in the **SCC.**

25.2 The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the Goods' final destination, or in another place in the Purchaser's Country as specified in the **SCC.** Subject to GCC Sub-Clause 25.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.

25.3 The Purchaser or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Sub-Clause 25.2, provided that the Purchaser bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

25.4 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.

25.5 The Purchaser may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications codes and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.

	25.6 The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.
	25.7 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to GCC Sub-Clause 25.4.
	25.8 The Supplier agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Purchaser or its representative, nor the issue of any report pursuant to GCC Sub-Clause 25.6, shall release the Supplier from any warranties or other obligations under the Contract.
26. Liquidated Damages	26.1 Except as provided under GCC Clause 31, if the Supplier fails to deliver any or all of the Goods by the Date(s) of delivery or perform the Related Services within the period specified in the Contract, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the **SCC** of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in those **SCC.** Once the maximum is reached, the Purchaser may terminate the Contract pursuant to GCC Clause 34.
27. Warranty	27.1 The Supplier warrants that all the Goods are new, unused, and of the most recent or current models (models which have not reached their end-of-sales), and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.
	27.2 Subject to GCC Sub-Clause 21.1(b), the Supplier further warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.
	27.3 Unless otherwise specified in the **SCC,** the warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the **SCC,** or for eighteen (18) months after the date of shipment from the port or place of loading in the country of origin, whichever period concludes earlier.

27.4 The Purchaser shall give notice to the Supplier stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect such defects.

27.5 Upon receipt of such notice, the Supplier shall, within the period specified in the **SCC,** expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Purchaser.

27.6 If having been notified, the Supplier fails to remedy the defect within the period specified in the **SCC,** the Purchaser may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

28. Patent Indemnity

28.1 The Supplier shall, subject to the Purchaser's compliance with GCC Sub-Clause 28.2, indemnify and hold harmless the Purchaser and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Purchaser may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of:

   (a) the installation of the Goods by the Supplier or the use of the Goods in the country where the Site is located; and

   (b) the sale in any country of the products produced by the Goods.

Such indemnity shall not cover any use of the Goods or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, neither any infringement resulting from the use of the Goods or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Supplier, pursuant to the Contract.

28.2 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Sub-Clause 28.1, the Purchaser shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

28.3 If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf.

28.4 The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

28.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Supplier may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Purchaser.

29. Limitation of Liability

29.1 Except in cases of criminal negligence or wilful misconduct,

(a) the Supplier shall not be liable to the Purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser and

(b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the supplier to indemnify the purchaser with respect to patent infringement

30. Change in Laws and Regulations

30.1 Unless otherwise specified in the Contract, if after the date of 28 days prior to date of Bid submission, any law, regulation, ordinance, order or by law having the force of law is enacted, promulgated, abrogated, or changed in the place of the Purchaser's country where the Site is located (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its

obligations under the Contract. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with GCC Clause 14.

31. Force Majeure

31.1 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

31.2 For purposes of this Clause, "Force Majeure" means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

31.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

32. Change Orders and Contract Amendments

32.1 The Purchaser may at any time order the Supplier through notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:

(a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;

(b) the method of shipment or packing;

(c) the place of delivery; and

(d) the Related Services to be provided by the Supplier.

32.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery/Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within

twenty-eight (28) days from the date of the Supplier's receipt of the Purchaser's change order.

32.3 Prices to be charged by the Supplier for any Related Services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

32.4 Subject to the above, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

33. Extensions of Time

33.1 If at any time during performance of the Contract, the Supplier or its subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to GCC Clause 12, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

33.2 Except in case of Force Majeure, as provided under GCC Clause 31, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 26, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 33.1.

34. Termination

34.1 Termination for Default

(a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:

(i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 33;

(ii) if the Supplier fails to perform any other obligation under the Contract; or

(iii) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 3, in competing for or in executing the Contract.

(b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 34.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

34.2 Termination for Insolvency.

(a) The Purchaser may at any time terminate the Contract by giving notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser

34.3 Termination for Convenience.

(a) The Purchaser, by notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

(b) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:

(i) to have any portion completed and delivered at the Contract terms and prices; and/or

(ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

35. Assignment   35.1 Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

36. Export Restriction

36.1 In case the conclusion of the contract is prevented by any export restrictions attributable to the Purchaser, to the country of the Purchaser or to the use of the products/goods or systems to be supplied in particular by sanctions arising from trade regulations from a country supplying those products/goods, systems or services, the supplier shall not be bound by its bid, always provided, however, that the supplier can demonstrate to the satisfaction of the Purchaser and of the Bank that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the delivery of the products/goods, systems or services under the terms of the contract.

36.2 Notwithstanding any obligation under the contract to complete all export formalities, any export restrictions attributable to the Purchaser, to the country of the Purchaser or to the use of the products/goods, systems or services to be supplied, in particular any export restrictions arising from trade regulations from a country supplying those products/goods, systems or services, that substantially impede the supplier from meeting its obligations under the contract shall release the supplier from the obligation to provide deliveries or services, always provided, however, that the supplier can demonstrate to the satisfaction of the purchaser and of the Bank that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the delivery of the products/goods, systems or services under the terms of the contract.

Section VIII. Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement and / or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

GCC 1.1(j)	The Purchaser's country is: **The Republic of Serbia**
GCC 1.1(k)	The Purchaser is: **Ministry of Information and Telecommunications**
GCC 1.1 (o)	The Project Site/Final Destination is: Academic and Research Network of Republic of Serbia Boulevard Kralja Aleksandra 90, 11000 Belgrade, The Republic of Serbia
GCC 4.2 (a)	The meaning of the trade terms shall be as prescribed by Incoterms. If the meaning of any trade term and the rights and obligations of the parties thereunder shall not be as prescribed by Incoterms, they shall be as prescribed by: **Not applicable**
GCC 4.2 (b)	The Incoterms edition is the latest edition at the time of contract signing published by the International Chamber of Commerce, 38 Cours Albert 1er, 75008 Paris, France the official web site at http://www.iccwbo.org/index_incoterms.asp
GCC 5.1	The Contract shall be written in **English** and Serbian**.** In the event of a dispute as to the terms of this Agreement the English version shall prevail.
GCC 8.1	For **notices**, the Purchaser's address shall be: To: **Ministry of Information and Telecommunications** Address: **Nemanjina 22- 26** City: **11000 Belgrade** Country: **The Republic of Serbia** Electronic mail address: internationalpublicprocurement@mit.gov.rs
GCC 9.1	The applicable law shall be the law of Serbia as long as aligned with EIB Guide to procurement.

GCC 10.2	The rules of procedure for arbitration proceedings pursuant to GCC Clause 10.2 shall be as follows: **Foreign-Trade Arbitration** **Serbian Chamber of Commerce** **11000 Belgrade, Terazije street No. 23, Seventh Floor**
GCC 12.1	Details of Shipping and other Documents to be furnished by the Supplier are: Upon shipping the goods, the Supplier shall inform the Purchaser about all the details of the shipment. The Supplier shall submit the following documents to the Purchaser by e-mail or regular mail: **a) Copy of the invoice with information on the items, quantity and value** **b) Manufacturer`s warranty certificate** **c) Delivery note.** The Purchaser should receive the abovementioned documents before the arrival of the goods and if they are not received, the Supplier is responsible for all consequential costs including customs duties.
GCC 14.2	The prices charged for the Goods supplied and the related Services performed **shall not** be adjustable.
GCC 15.1	GCC 15.1—The method and conditions of payment to be made to the Supplier under this Contract shall be as follows: **i) Advance Payment:** An advance payment in the amount of *[up to 40 (forty) percent of the Contract Price] [insert currency]* shall be paid within thirty (30) days of signing of the Contract against a receipt of: 1. **Advance payment bank guarantee** 2. **Valid invoice**, provided in accordance with the applicable national legislation of the Purchaser's country 3. **VAT exemption decision** issued by the Tax Authority in the Purchaser's country. The advance bank payment guarantee shall be in the amount and in the currency of the currency of the advance payment and in the form provided in the bidding document or another form acceptable to the Purchaser. The advance payment will be offset by the Purchaser in equal portions against the Supplier's invoices as follows: advance payment percentage (for example, 40%) of the amount of each invoice, and, if the full amount of the Advance has not been fully offset, the balance of the Advance shall be offset against the amount of the final invoice. The bank guarantee will be released when the advance payment has been fully set off.

	(ii) On Delivery: The part of Contract Price amount specified for the items no. 1 - 11 in the Price Schedule (equipment and licenses) shall be paid upon receipt of the Goods and submission of the following documents: 1. **Valid invoice,** provided in accordance with the applicable national legislation of the Beneficiary's country 2. **VAT exemption decision** issued by the Tax Authority in the Beneficiary's country 3. **Quantitative acceptance document** dully signed (iii) **On Acceptance:** The remaining amount of the Contract Price shall be paid to the Supplier within thirty (30) days after the receipt of the following documents: 1. **Valid invoice,** provided in accordance with the applicable national legislation of the Beneficiary's country 2. **VAT exemption decision** issued by the Tax Authority in the Beneficiary's country 3. **Qualitative acceptance document** for the complete delivery and installation under this contract issued by the Beneficiary 4. **Manufacturer`s warranty certificate for the equipment**
GCC 15.5	The payment-delay period after which the Purchaser shall pay interest to the supplier shall be **forty-five (45)** days upon issuing of invoice and other relevant documents. The interest rate that shall be applied is Serbia Central Bank's (National Bank of Serbia) official yearly interest rate.
GCC 17.1	A Performance Security **shall be required.** The Performance Security shall be in the form of a Bank Guarantee, which must have the clauses: unconditional, payable on first call and without the right to object. The Bank Guarantee should be issued: in the amount of 10% of the total value of this Contract (excluding VAT), with a validity of 8 months after the contract signing date. The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than twenty-eight (28) days following the date of Completion of the Supplier's performance obligations under the Contract related to implementation (Phase 1 and Phase 2 of the Project, excluding warranty period).

GCC 17.3	The Supplier shall, within twenty-eight (28) days of the notification of contract award, provide a performance security for the performance of the Contract as per template in Appendix: Performance Security Form. If the Supplier submits a bank guarantee of a foreign bank in a foreign language, he shall also submit a translation of that bank guarantee in the Serbian language, translated by an authorized court interpreter. The submitted bank guarantee may not contain additional payment conditions, a shorter period than the one specified by the Purchaser, a smaller amount than determined by the Purchaser or an altered local jurisdiction for resolving disputes. The Bank Guarantee may be forfeited if the Supplier does not fulfil its obligations in the manner and under the conditions defined in this Contract or if the Supplier does not comply with the regulations governing the area of the subject of the Contract.
GCC 17.4	Discharge of the Performance Security for the implementation period shall take place: twenty-eight (28) days upon signed qualitative acceptance certificate for the complete delivery under this contract issued by the Purchaser.
GCC 17.5	A Security for the Elimination of Defects in the Warranty Period shall be required. The Supplier shall, within twenty eight (28) days after signing the **Qualitative acceptance document**, provide a Security for the Elimination of Defects in the Warranty Period.
GCC 17.6	The Security for the Elimination of Defects in the Warranty Period shall be in the form of a bank guarantee, which must have the following clauses: unconditional, payable on first call and without the right to objection. The Security for the Elimination of Defects in the Warranty Period shall be issued in the amount of 5 % of the total value of the particular contract excluding VAT, with a validity of 28 (twenty eight) days after the end of the warranty period. The Purchaser shall redeem the Security for the Elimination of Defects in the Warranty Period in case the Supplier does not eliminate defects that would reduce the possibility of using the subject of the contract in the warranty period. The Performance Security for Warranty Period shall be discharged by the Purchaser and returned to the Supplier not later than twenty-eight (28) days following the date of Completion of the Supplier's performance obligations under the Contract related to warranty period (warranty period expired).
GCC 22.3	The packing, marking and documentation within and outside the packages shall be: Manufacturer's original packaging (trademark owner's)

GCC 23.1	The insurance coverage shall be as specified in the Incoterms.
GCC 24.1	**The Supplier is required under the Contract to transport the Goods to a specified place of final destination within the Purchaser's country, defined as the Project Site. Transport to such place of destination in the Purchaser's country, including insurance and storage, shall be arranged by the Supplier, and related costs shall be included in the Contract Price.**
GCC 25.1	**No inspections and tests are foreseen.**
GCC 25.2	n/a
GCC 26.1	The liquidated damage shall be: **one percent (1%)** per week
GCC 26.1	The maximum amount of liquidated damages shall be**: ten percent (10%)**
GCC 27.3	The period of validity of the Warranty shall be: **in accordance with requirements stated in "Related Services and Delivery Schedules", "Technical Specifications" and "Technical Specification Form"** in Section VI, Schedule of Requirements of the Bidding Documents.
GCC 27.5	The period for repair or replacement shall be: **in accordance with requirements stated in "Related Services and Delivery Schedules", "Technical Specifications" and "Technical Specification Form"** in Section VI, Schedule of Requirements of the Bidding Documents.

Section IX. Contract Forms

Table of Forms

1. Contract Agreement

THIS CONTRACT AGREEMENT is made

BETWEEN

1) Ministry of Information and Telecommunications, No.22- 26, Nemanjina Street 11000 Belgrade, The Republic of Serbia (hereinafter called "The Purchaser")
   and

2) [insert name of Supplier], a corporation incorporated under the laws of [insert: country of Supplier**]** and having its principal place of business at [insert: address of Supplier] (hereinafter called "the Supplier")

WHEREAS the Purchaser invited bids for certain Goods and ancillary services named:

Expansion of AMRES data center virtualization and school network monitoring capacities, EIB-GtP/ 337-00-77/2023-06

and has accepted a Bid by the Supplier for the supply of those Goods and Services in the sum of:

_____ EUR *[write number and word]*

[insert Total Bid Price as given in Price Schedule Form]

(hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract:

This Contract Agreement

Special Conditions of Contract

General Conditions of Contract

Appendixes:

Technical Requirements (including Schedule of Requirements, Technical Specifications and Technical Specification Form)

The Supplier's Bid and original Price Schedule

Preliminary List of Final Destinations

The Purchaser's Notification of Award

Bank Guarantee for Advance Payment Form

Performance Security Form

All other documents that make tender documentation

3.   This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

4.   In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

5.   The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of the Republic of Serbia on the day, month and year indicated above.

For and on behalf of the Purchaser

Signed: [insert signature]
in the capacity of [insert title or other appropriate designation]
in the presence of [insert identification of official witness]

For and on behalf of the Supplier

Signed: [insert signature of authorized representative(s) of the Supplier]
in the capacity of [insert title or other appropriate designation]
in the presence of [insert identification of official witness]

2. Performance Security Form

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

Date: *[insert date (as day, month, and year) of Bid Submission]*

Bank's Branch or Office: *[insert complete name of Guarantor]*

Beneficiary: *[insert complete name of Purchaser]*

PERFORMANCE GUARANTEE No: *[insert Performance Guarantee number]*

We have been informed that *[insert complete name of Supplier]* (hereinafter called "the Supplier") has entered into Contract No. *[insert number]* dated *[insert day and month], [insert year]* with you, for the supply of *[description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a Performance Guarantee is required.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum(s) not exceeding *[insert amount(s[16]) in figures and words]* upon receipt by us of your first demand in writing declaring the Supplier to be in default under the Contract, without cavil or argument, or your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This Guarantee shall expire no later than the *[insert number]* day of *[insert month] [insert year]*,[17] and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

[signatures of authorized representatives of the bank and the Supplier]

---

[16] *The Bank shall insert the amount(s) specified in the SCC and denominated, as specified in the SCC, either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Purchaser.*

[17] *Dates established in accordance with Clause 17.4 of the General Conditions of Contract ("GCC"), taking into account any warranty obligations of the Supplier under Clause 15.2 of the GCC intended to be secured by a partial Performance Guarantee. The Purchaser should note that in the event of an extension of the time to perform the Contract, the Purchaser would need to request an extension of this Guarantee from the Bank. Such request must be in writing and must be made prior to the expiration date established in the Guarantee. In preparing this Guarantee, the Purchaser might consider adding the following text to the Form, at the end of the penultimate paragraph: "We agree to a one-time extension of this Guarantee for a period not to exceed [six months] [one year], in response to the Purchaser's written request for such extension, such request to be presented to us before the expiry of the Guarantee."*

3. Bank Guarantee for Advance Payment Form

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated.]

Date: *[insert date (as day, month, and year) of Bid Submission]*

Bank's Branch or Office: *[insert complete name of Guarantor]*

Beneficiary: *[insert legal name and address of Purchaser]*

ADVANCE PAYMENT GUARANTEE No.: *[insert Advance Payment Guarantee no.]*

We, *[insert legal name and address of bank],* have been informed that *[insert complete name and address of Supplier]* (hereinafter called "the Supplier") has entered into Contract No. *[insert number]* dated *[insert date of Agreement]* with you, for the supply of *[insert types of Goods to be delivered]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance is to be made against an advance payment guarantee.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount(s)[18] in figures and words]* upon receipt by us of your first demand in writing declaring that the Supplier is in breach of its obligation under the Contract because the Supplier used the advance payment for purposes other than toward delivery of the Goods.

This Guarantee shall remain valid and in full effect from the date of the advance payment received by the Supplier under the Contract until *[insert date[19]].*

This Guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

[signatures of authorized representatives of the bank and the Supplier]

---

[18] *The bank shall insert the amount(s) specified in the SCC and denominated, as specified in the SCC, either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Purchaser.*

[19] *Insert the Delivery date stipulated in the Contract Delivery Schedule. The Purchaser should note that in the event of an extension of the time to perform the Contract, the Purchaser would need to request an extension of this Guarantee from the bank. Such request must be in writing and must be made prior to the expiration date established in the Guarantee. In preparing this Guarantee, the Purchaser might consider adding the following text to the Form, at the end of the penultimate paragraph: "We agree to a one-time extension of this Guarantee for a period not to exceed [six months][one year], in response to the Purchaser's written request for such extension, such request to be presented to us before the expiry of the Guarantee."*

4. Security for the Elimination of Defects in the Warranty Period

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

Date: *[insert date (as day, month, and year) of Bid Submission]*
Procurement reference number [insert]

Bank's Branch or Office: *[insert complete name of Guarantor]*

Beneficiary: *[insert complete name of Purchaser]*

PERFORMANCE GUARANTEE No: *[insert Performance Guarantee number]*

We have been informed that *[insert complete name of Supplier]* (hereinafter called "the Supplier") has entered into Contract No. *[insert number]* dated *[insert day and month], [insert year]* with you, for the supply of *[description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a Security for the Elimination of Defects in the Warranty Period is required.

At the request of the Supplier, we hereby irrevocable, unconditional, payable on first call and without the right to object undertake to pay you any sum(s) not exceeding *[insert amount(s[20]) in figures and words]* upon receipt by us of your first demand in writing declaring the Supplier to be in default under the Contract, without cavil or argument, or your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This Guarantee shall expire no later than the *[insert number]* day of *[insert month] [insert year]*,[21] and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

[signatures of authorized representatives of the bank and the Supplier]

---

[20]   *The Bank shall insert the amount(s) specified in the SCC and denominated, as specified in the SCC, either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Purchaser.*
[21]   *Dates established in accordance with Clause 17.4 of the General Conditions of Contract ("GCC"), taking into account any warranty obligations of the Supplier under Clause 15.2 of the GCC intended to be secured by a partial Performance Guarantee. The Purchaser should note that in the event of an extension of the time to perform the Contract, the Purchaser would need to request an extension of this Guarantee from the Bank. Such request must be in writing and must be made prior to the expiration date established in the Guarantee. In preparing this Guarantee, the Purchaser might consider adding the following text to the Form, at the end of the penultimate paragraph: "We agree to a one-time extension of this Guarantee for a period not to exceed [six months] [one year], in response to the Purchaser's written request for such extension, such request to be presented to us before the expiry of the Guarantee."*

5. Notification of Intention to Award

[*This Notification of Intention to Award shall be sent to each Bidder that submitted a Bid.*]

[*Send this Notification to the Bidder's Authorized Representative named in the Bidder Information Form*]

For the attention of Bidder's Authorized Representative

Name: [*insert Authorized Representative's name*]

Address: [*insert Authorized Representative's Address*]

Telephone/Fax numbers: [*insert Authorized Representative's telephone/fax numbers*]

Email Address: [*insert Authorized Representative's email address*]

[*IMPORTANT: insert the date that this Notification is transmitted to Bidders. The Notification must be sent to all Bidders simultaneously. This means on the same date and as close to the same time as possible.*]

DATE OF TRANSMISSION: This Notification is sent by: [*email/fax*] on [*date*] (local time)

Notification of Intention to Award

Purchaser: [*insert the name of the Purchaser*]
Project: [*insert name of project*]
Contract title: [*insert the name of the contract*]
Country: [*insert country where RFB is issued*]
Loan No. /Credit No. / Grant No.: [*insert reference number for loan/credit/grant*]
RFB No: [*insert RFB reference number from Procurement Plan*]

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period you may:

    a) request a debriefing in relation to the evaluation of your Bid, and/or

    b) submit a Procurement-related Complaint in relation to the decision to award the contract.

1. **The successful Bidder**

Name:	[*insert name of successful Bidder*]
Address:	[*insert address of the successful Bidder*]
Contract price:	[*insert contract price of the successful Bid*]

2. **Other Bidders** [*INSTRUCTIONS: insert names of all Bidders that submitted a Bid. If the Bid's price was evaluated include the evaluated price as well as the Bid price as read out.*]

Name of Bidder	Bid price	Evaluated Bid price (if applicable)
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]
[*insert name*]	[*insert Bid price*]	[*insert evaluated price*]

3. Reason/s why your Bid was unsuccessful

[INSTRUCTIONS: State the reason/s why this Bidder's Bid was unsuccessful. Do NOT include: (a) a point by point comparison with another Bidder's Bid or (b) information that is marked confidential by the Bidder in its Bid.]

4. How to request a debriefing

Deadline: The deadline to request a debriefing expires at midnight on [*insert date*] (local time).

You may request a debriefing in relation to the results of the evaluation of your Bid. If you decide to request a debriefing your written request must be made within three (3) Business Days of receipt of this Notification of Intention to Award.

Provide the contract name, reference number, name of the Bidder, contact details; and address the request for debriefing as follows:

Attention: [*insert full name of person, if applicable*]

Title/position: [*insert title/position*]

Agency: [*insert name of Purchaser*]

Email address: [*insert email address*]

Fax number: [*insert fax number*] *delete if not used*

If your request for a debriefing is received within the 3 Business Days deadline, we will provide the debriefing within two (2) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (5) Business Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.

The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.

If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Business Days from the date of publication of the Conclusion of Contract Notice.

5. How to make a complaint

Deadline: Procurement-related Complaint challenging the decision on evaluation of Bids shall be submitted by midnight, [*insert date*] (local time).

Provide the Contract name, reference number, name of the Bidder, contact details; and address the Procurement-related Complaint as follows:

Attention: [*insert full name of person, if applicable*]

Title/position: [*insert title/position*]

Agency: [*insert name of Purchaser*]

Email address: [*insert email address*]

Fax number: [*insert fax number*] *delete if not used*

At this point in the procurement process, you may submit a Procurement-related Complaint challenging the decision on evaluation of Bids. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends as stipulated in ITB in tender document.

Further information:

For more information see Serbian Law on Procurement. You should read these provisions before preparing and submitting your complaint.

In summary, there are two essential requirements:

1. You must be an 'interested party'. In this case, that means a Bidder who submitted a Bid in this procurement process, and is the recipient of a Notification of Intention to Award.
2. You must submit the complaint within the period stated above.

You must submit your complaint as specified in the Instructions to Bidders Clause 47.2 (details provided in Data Sheet, ITB 47.2).

6. Standstill Period

Deadline: The Standstill Period is due to end at midnight on [*insert date*] (local time).

The Standstill Period lasts ten (10) days after the date of transmission of this Notification of Intention to Award.

The Standstill Period may be extended as stated in the section above titled 'How to request a debriefing'.

If you have any questions regarding this Notification please do not hesitate to contact us.

On behalf of the Purchaser:

Signature: _____

Name: _____

Title/position: _____

Telephone: _____

Email: _____

6. Notification of Award

[use letterhead paper of the Purchaser]

<div align="right">

[date]

</div>

To: *[name and address of the Supplier]*

Subject: ***Notification of Award Contract No.*** . . . .

This is to notify you that your Bid dated ***[insert date]*** for execution of the ***[insert name of the contract and identification number, as given in the SCC]*** for the Accepted Contract Amount of ***[insert amount in numbers and words and name of currency]***, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by the Purchaser.

You are requested to furnish (i) signed Contract Agreement within eight (8) Business days and (ii) the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Form provided in Section IX, Contract Forms, of the Bidding documents.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Purchaser: _____

Attachment: Contract Agreement