

INVITATION TO TENDER

ECMWF/ITT/2019/BOND23

PROCUREMENT OF

Management and Monitoring Network

at ECMWF, Tecnopolo di Bologna, Bologna, Italy

Volume II:

Specification of Requirements

20 May 2019

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Background

Definitions

Definitions used in this Invitation to Tender (ITT) are listed here:

| | |
|--------------------------------|---|
| Acceptance Date | the date or dates set out in Schedule 1 being the date or dates by which the System must successfully complete the Functional Test and User Acceptance Tests in accordance with Schedule 4 of the Contract |
| Agreement | volume III of this ITT including all schedules thereto |
| Bill of Materials (BoM) | the list of hardware, software and services that will be purchased for the Deployment Phase 1 |
| Contract | the documents defining the Parties' rights and obligations comprising the Agreement, ECMWF's Letter of Acceptance of Tender, the ITT Documentation and the Contractor's Tender in accordance with Clause 2.1 of the Agreement |
| Centre | ECMWF |
| Contractor | successful Tenderer |
| Data Hall | a space within the data centre that is used to host IT infrastructures and the high-performance computers and related services |
| Delivery Date | the dates, as specified in the Deployment Phase 1 Delivery Date in Volume III, or on a Purchase Order, on which the Works shall be deemed to be delivered at the ECMWF Site of Reading or Bologna |
| Deployment Phase 1 | the first phase of Works carried out by ECMWF and the Contractor |
| ECMWF | European Centre for Medium-Range Weather Forecasts |
| Fabric Layer | the infrastructure that interconnects the network components together to provide connectivity to all IT systems in the data centre |
| First Response Time | the number of minutes, hours, or days between when a customer submits a support ticket and when a customer support representative provides an initial response |
| Functional Test | the test that will be performed on the Works outlined in Clause 4 of Schedule 4 of Volume III |
| High Performance Network (HPN) | the name used by ECMWF to describe the Fabric Layer infrastructure |
| Hypercare | the stabilisation period after an installation is completed |
| ITT | this Invitation To Tender |
| Low Level Design (LLD) | the stage where a solution's hardware and software components are designed and configuration templates created |

| | |
|---------------------------|--|
| Management and Monitoring | The infrastructure that provides access to the OOBM ethernet interfaces of the switches, firewalls, routers and the server Lights-Out-management interfaces for management and monitoring purposes |
| Manufacturer | original equipment manufacturer of the supplied hardware and software components |
| OEM | original equipment manufacturer |
| OOBM | Out-of-Band Management Network |
| Preferred Bidder | the Tenderer selected by ECMWF for the award of this Contract |
| Reliability Test | the test that will be performed on the Works outlined in Clause 3.3 of Schedule 4 of Volume III |
| Requirement | a singular documented physical or functional need that a design, product or process aims to meet |
| RMA | Return Merchandise Authorization (RMA) - the process of returning a product to receive a replacement during the product's warranty period |
| Services | all the services listed in the Bill of Materials or on a Purchase Order, to be provided by the successful tenderer to ECMWF under this Contract |
| Tender | a response to this ITT |
| Tenderer | an organisation bidding for this ITT |
| Tests | the tests that will be performed on the Works outlined in Schedule 4 of Volume III |
| User Acceptance Tests | the acceptance tests to be undertaken as defined in Clause 5 of Schedule 4 of the Contract |
| Works | all hardware & software furnished and all Services to be performed by the successful tenderer under this Contract |
| You | the recipient of this ITT, a prospective "Tenderer" |

The definitions included in Clause 1 of the Contract are also applicable to this Volume II of the ITT Documentation.

Introduction

This Invitation To Tender (ITT) has been prepared by the European Centre for Medium-Range Weather Forecasts, (governed by its Convention and associated Protocol on Privileges and Immunities which came into force on 1 November 1975, and was amended on 6 June 2010) ("ECMWF") for the purposes of obtaining proposals from Tenderers for the procurement of Management and Monitoring network equipment. ECMWF is an independent intergovernmental organisation supported by 34 States. Information on ECMWF's activities can be found at:

<https://www.ecmwf.int/en/about>

The installation will be at ECMWF's offices in Shinfield Road, Reading, UK and its new data centre at Tecnopolo di Bologna, Via Stalingrado, Bologna, Italy from late Q3 2019 onwards. Additional information on ECMWF's current Computer Environment and LAN can be found at:

<https://www.ecmwf.int/en/computing/our-facilities>

<https://www.ecmwf.int/en/computing/our-facilities/networks>

ECMWF's new data centre

In June 2017 ECMWF Member States approved the proposal by the Italian Government and the Emilia Romagna Region to host ECMWF's new data centre in Bologna. The new data centre is currently being built on the site of the new Tecnopolo di Bologna campus that is redeveloping the unused buildings and grounds of a former tobacco factory. ECMWF's headquarters are to remain in the UK. Details about the new data centre can be found here:

<https://www.ecmwf.int/en/about/media-centre/press-kit-bologna-host-ECMWFs-new-data-centre>

ECMWF expects the Bologna data centre will be run with a small staff complement, that includes a 24 hour a day, 7 days a week, 365 days a year (24x7x365) operations team responsible for the monitoring of the infrastructure.

The Networks and Security infrastructure

The Networks and Security infrastructure to be deployed in Bologna and Reading will provide the enabling connectivity and security services required by all IT services operated by ECMWF. The infrastructure is made up of the following three main components:

- **Fabric Layer:** the infrastructure that provides network connectivity to ECMWF's ICT platforms and services, including the High Performance Computer Facility (HPCF) and Data Handling System (DHS) systems;
- **Security Layer:** the infrastructure required to control critical internal and external data traffic to protect ECMWF from internal and external threats;
- **Internet Edge Layer:** the infrastructure required to provide connectivity between the Security Layer and the wide area network through ECMWF's Internet, RMDCN and telephony SIP connectivity;

In addition to the above mentioned three layers, physically segregated networks and infrastructures will be used to address the following specific needs:

- **Offices Networks in Reading and Bologna**

- **Management & Monitoring**
- **Auxiliary services: DNS, DHCP, and IPAM (DDI) and Network Time Protocol (NTP)**
- **Auxiliary services: Application Control and Load Sharing**

The following corporate high-level design overview gives an idea about the design components that form the Networks and Security infrastructure:

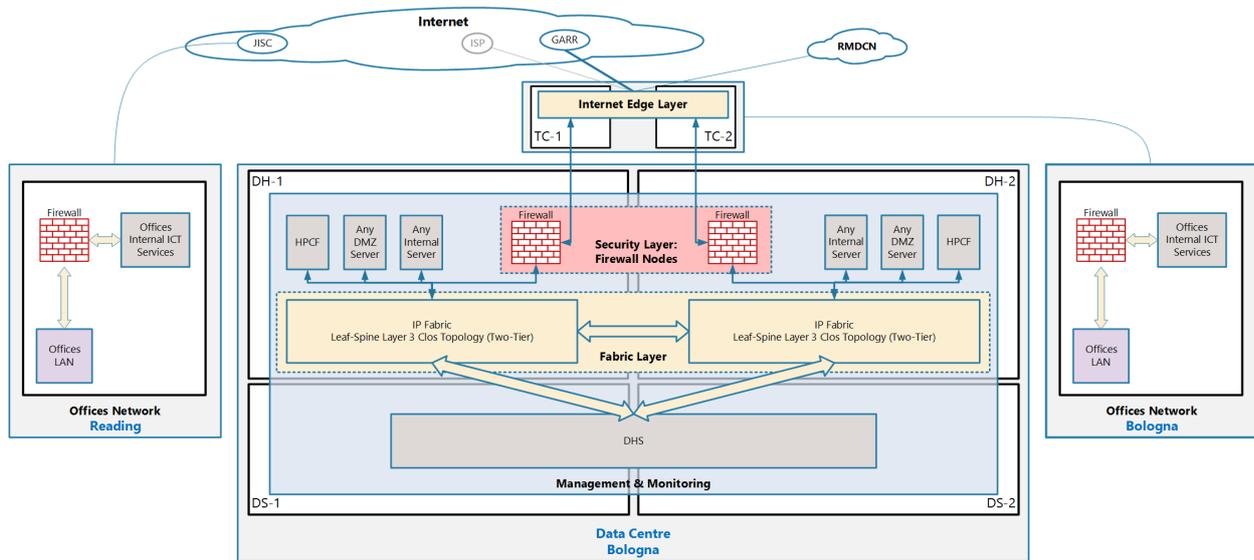


Figure 1: Corporate network and security design overview

The physically segregated Management and Monitoring Network will be used to provide Out-of-Band access to servers and network equipment through the OOBM ethernet interfaces and the server Lights-Out-management interfaces. The Management and Monitoring Network allows the connected equipment to be accessed for management and monitoring purposes..

Scope of the ITT

The purpose of this Invitation to Tender (ITT) is for ECMWF to enter into a long-term contract for the supply of equipment and its associated maintenance and support services, and other services to build a Management and Monitoring Network that will be purchased and installed by ECMWF as part of the new networks and security infrastructure at ECMWF's existing facility in Reading, England and its new data centre at Tecnopolo di Via Stalingrado, Bologna, Italy from late 2019 onwards.

This ITT will also include training of ECMWF staff on the selected vendor's hardware and software.

This ITT is open to Tenderers who are certified resellers of network equipment manufacturer(s). A Tenderer can only propose a solution or solutions that use products made by one manufacturer. The notable exception to the utilisation of the manufacturer is optical transceivers and direct attached cables where non-Original Equipment Manufacturers can be used in the proposed solution or solutions.

This ITT is for the initial purchase of Works for the Deployment Phase 1 followed by further purchases of additional Works on a call-off basis over the life of the Contract. The term will be for a minimum period of three (3) years, with ECMWF having the option to extend thereafter to a maximum term of eight (8) years.

Further information is included in Volume I (Instructions for Tenderers and Conditions of Tender) of the ITT.

ITT timetable

ECMWF envisages the below timetable for this ITT. ECMWF reserves the right to amend these dates at any point. If ECMWF decides to amend any of the dates or milestones portrayed above then it shall notify the Suppliers who have expressed an interest or Tenderers via the eProcurement portal.

| Date | Description |
|--|---|
| 20 th May 2019 | Date for release of tender by ECMWF |
| 3 rd June 2019 | Clarifications close |
| 17 th June 2019 | 14:00 local UK time - Closing date for receipt of tender response |
| June/July 2019 | Evaluation of tenders |
| 1 st -5 th July 2019 | Presentations by tenderers |
| July 2019 | Preferred bidder(s) notified and negotiations of contractual terms |
| July / August 2019 | Signing of the Contract and issue the purchase order for the Deployment Phase 1 |
| August / September 2019 | Start of the User Acceptance Tests |
| Q4 2019 | Start of the Deployment Phase 1 in Bologna |

Table 1: Envisaged timeline for this ITT

Evaluation method and selection criteria

Tenderers will be evaluated, utilising the criteria detailed in Table [2] below, based on both written proposals and any oral presentations. However, ECMWF reserves the right to use information other than that provided by the Tenderers in its evaluation.

The following are the key evaluation criteria and their associated weighting that will be used as part of the evaluation process. ECMWF will be looking for strong capability in all the following aspects:

| Evaluation criteria | Weighting |
|---|------------------|
| Tenderer's credentials <ul style="list-style-type: none">• Pre-Qualification Requirements;• Presentation and Demonstrations;• Support Capabilities;• Professional Services;• Service Delivery and Acceptance Tests. | 10% |
| Compliance with technical and operational Requirements <ul style="list-style-type: none">• Management and Monitoring Network equipment;• Support and Training;• Transceivers and Cables. | 60% |
| Pricing and Agreement | 30% |

Table 2: Evaluation Criteria & Weighting

The evaluation of the Tenderer's Credentials will be based on the Tenderer's responses to Volume IA and to Appendix 1 of this document.

The evaluation of the Tenderer's compliance with technical and operational Requirements will be based on the Tenderer's response to Appendix 2 of this document.

The evaluation of the Tenderer's response to the Pricing and Agreement criteria will be based on the Tenderer's financial submission in response to Appendix 3 of this document.

The evaluation process will be split into three stages.

1. The first stage of the evaluation will be based on the information provided in Volume IA Tender Submission Form and the responses to section "A1.1 Pre-Qualification Requirements" of this volume II document and will determine a list of Tenderers for consideration for the second stage. Tenderers who are not selected to stage two will not be considered further for this ITT. The ECMWF evaluation team shall be permitted to review other parts of the Tender if the team considers this is necessary to determine which Tenders should be fully evaluated in the second stage.

2. The second stage of the evaluation will be based on a full evaluation of the Tenders and will determine a shortlist of Tenderers for invitation to the third stage. Tenderers who are not shortlisted to stage three will not be considered further for this ITT.
3. The third stage will involve a presentation / Q&A session on ECMWF premises in Reading by the short-listed Tenderer(s). The key bidder staff nominated for this ITT are expected to take place in accordance with the dates indicated in Table 1 - ECMWF envisages giving at least one week's notice of such. At these events, the Tenderer will have the opportunity to showcase the aspects of their proposed solution or solutions and both parties shall have the opportunity to clarify any outstanding elements of the ITT response. Following the event(s) and any subsequent clarifications, the shortlisted Tenderer(s) will be invited to submit their 'best and final offer' Tender to ECMWF, for final evaluation¹.

As a result, a Preferred Bidder(s) will be established with whom final contract negotiations will be opened. ECMWF reserves the right to negotiate with one or more Tenderers before taking a decision on awarding the Contract. Within one (1) month following the notification of award of the Contract, any unsuccessful Tenderer may request, in writing, feedback from ECMWF on the evaluation of the Tenderer's Tender submission².

ECMWF Questions during Evaluation

During the evaluation of Tenders, ECMWF reserves the right to ask questions to clarify aspects of Tenderers' submissions. ECMWF will expect Tenderers to answer such questions promptly (normally with one business day of receipt). ECMWF will address questions by email to the contact you nominate in your Volume IA Tender Submission Form or via the procurement portal and you should therefore ensure that your contact monitors his/her emails and the procurement portal at all times during our evaluation.

¹ ECMWF will review the initial evaluation results for the shortlisted Tenderers and may adjust these results in line with their findings during the presentation / Q&A session and/or the site visit and any revisions made in the 'best and final offer' Tender.

² It is at ECMWF's sole discretion if, following any request from a Tenderer, it provides feedback to the Tenderer on their Tender submission

Organisation of this document

In accordance with the evaluation method and selection criteria listed in the previous section, the remainder of this ITT is organised as follows:

- Tender Requirement Instructions;
- Appendix 1 Tenderer's Credentials;
- Appendix 2 Technical and Operational Requirements;
- Appendix 3 Pricing and Agreement.

Tender Requirement Instructions

Tenderers should note that they need to ensure that Requirements are fully addressed, since a partial response may not be considered or evaluated. This includes the Requirements present in this section, in the appendices and in the embedded Excel spreadsheets.

In this document, Requirements are categorised by the bold notations **M**, **D** or **R** to the left of the pertinent section.

| Requirement category | Definition |
|-----------------------------|---|
| M | denotes a MANDATORY Requirement: a Requirement that must be adhered to, or a performance Requirement that must be met in order that the tendered solution can be accepted by ECMWF. ECMWF will not consider a tendered solution that fails to meet a mandatory specification Requirement (marked M) unless the tenderer offers valid reasons why the feature in question is either unnecessary for, or irrelevant to, the tendered solution or is deemed as an improvement over that specified. |
| D | denotes a DESIRABLE feature. The extent to which any tender offers features listed as desirable (marked D) will be one of the factors taken into account in selecting the winning tender. If offered, the feature must be included in the overall price for the Works. |
| R | denotes a REQUEST for information. A response must be given to all such requests. Requests for information (marked R) are intended to provide a description of the construction, philosophy, operation and the cost implications of the tendered solution in areas that are regarded as being of particular importance. A clear response to such requests will be of assistance to ECMWF in the tender evaluation process. |

Table 3: Categories of Requirements

With regard to the Tenderer’s ability to accommodate the Requirements, the Tenderer must use the following schema for completing the **Detailed Description** and **Self-Score** columns:

- When populating the **Detailed Description** columns, Tenderers should note that, where relevant, when addressing that a Requirement is met, tenderers must give minimum sufficient detail to explain the way in which the Requirement is met - a simple expression, such as “compliant” or “agreed”, will not normally suffice.
 - Unless stated otherwise, the Detailed Description should be no longer than 250 words. Where word counts above 250 words are allowed, the higher limit will be clearly stated. Any text above the maximum specified word count will not be evaluated.
 - Attachments/Annexes should not be submitted, unless the Requirement expressly requests or authorises their submission.
 - Tenderers are reminded that referencing web sites or providing hyperlinks does not provide an acceptable means of informing their submission. Any references of these types will be ignored and will not be evaluated.

2. Any additional features not listed in the ITT as Requirements, but which the tenderer feels may be relevant, should be clearly identified and supported by descriptive material.
 - Note that ECMWF seeks focused responses, rather than responses which include a significant amount of standard marketing material. If you wish to include marketing material in your proposal documentation set, it should be provided as discrete documents and limited to only marketing material which is directly relevant to the response and marked as "Marketing Material". ECMWF reserve the right not to evaluate Marketing Material if it deems it to be irrelevant.
3. When populating the **Self-Score** column, the Tenderer must self-score following the definitions in the table below to provide an indication of compliance with the Requirement

| Self-Score Value | Definition |
|-------------------------|--|
| 3 | Tenderer fully meets or exceeds the ECMWF Requirement. |
| 2 | Tenderer partially meets the ECMWF Requirement. The Requirement will be met as part of a future commitment. In the Detailed Description column, describe how the Requirement will be fully met. Specify, where applicable, associated timescale and cost. |
| 1 | Tender does not meet the ECMWF Requirement at the time of response. The Requirement will be met as part of a future commitment. In the Detailed Description column, describe how the Requirement will be fully met. Specify, where applicable, associated timescale and cost. |
| 0 | Tenderer cannot meet the ECMWF Requirement. |

Table 4: Self-scoring values and definitions

Self-Scores will be validated by ECMWF to ensure they have been completed accurately. Where ECMWF's assessment is different to the Tenderer's Self-Score, ECMWF may ask the Tenderer to review and justify its Self-Score.

Tenderers must address the Requirements listed in the table below together with the Requirements listed in the Appendixes.

| Tender Requirement | | | |
|---------------------------|---|-----------------------------|-------------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| M(1) | Tenderers must ensure that all Requirements in this ITT are addressed and a response, in electronic format, is posted to ECMWF's eProcurement Portal prior to the deadline; partial responses will not be considered. N.B. efforts have been made to remove duplicate Requirements, where this may occur, please still address the Requirement and/or reference your first response. | | |
| M(2) | Tender documentation must be written in English. | | |

Except for the Requirements listed in Appendix 1.2 of this Volume, Tenderers should note that responses to all Requirements specified in Volumes I and II of this ITT must be submitted by the Tender Closing Date. Tenderers invited to make presentations or give presentations to ECMWF in Stage 3 of the evaluation process may be required to address the Requirements set out in Appendix 1.2

Appendix 1 Tenderer's Credentials

A1.1. Pre-Qualification Requirements

| Pre-Qualification Requirements | | | |
|--------------------------------|---|----------------------|------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| M(3) | Tenderers must confirm that, with the notable exception of optical transceivers and direct attached cables, the proposed solution or solutions use products made by a single manufacturer and provide its name. | | |
| M(4) | Tenderers must confirm they are a certified reseller/partner/integrator of the manufacturer of the equipment used in the proposed solution or solutions, with the notable exception of the optical transceivers and direct attached cables. Tenderers must indicate and provide evidence of the level of accreditation/partnership. | | |
| M(5) | <p>Using section 6 of Volume IA (Tender Submission Form), the Tenderer must provide an executive summary to describe the key aspects and advantages of its Tender.</p> <p>The executive summary must:</p> <ul style="list-style-type: none"> • Provide a top level description of the Tenderer's design • Describe how the Tenderer will satisfy the technical and other Requirements set out in the ITT; • Define the advantages to ECMWF of accepting the Tender • Demonstrate the ability of the Tenderer to supply and support its solution • Describe the commercial and pricing benefits offered the Tenderer's solution • Detail the Tenderer's relationship with the proposed suppliers of hardware • Where third parties are referenced in the Tender, describe the Tenderer's relationship with them and the way in which they will contract with them <p>The executive summary is intended to give ECMWF an overview of the Tender so that it can understand the Tenderer's approach. Tenderers are not expected to repeat detailed technical, pricing or other responses in their executive summaries.</p> | | |

| | | | |
|--------------|---|--|--|
| | (The response to this Requirement must be no longer than 1000 words but may also contain diagrams). | | |
| M(6) | Tenderers must list the core technical competencies of their organisation. This must include the details of what is considered to be the key technology areas supported by the organisation. (Maximum 500 words). | | |
| R(7) | Tenderers are invited to indicate the technical certifications/accreditations/awards relevant to this tender that their organisation holds. | | |
| R(8) | Tenderers are invited to indicate their proposed account management structure as follows: <ul style="list-style-type: none"> • describe your governance processes to manage an effective relationship and the successful delivery including roles and responsibilities of people involved from both sides, the frequency of the different meetings and the purpose of each meeting; • describe the key management dashboards and empirical information that you suggest are used to govern the relationship; • propose how continuous improvements will be made to the governance process. | | |
| R(9) | Tenderers are invited to provide a description of their territorial presence in Italy, with focus on the Bologna area. | | |
| M(10) | Tenderers must confirm that the support and maintenance of the manufacturer's hardware and software equipment will be done directly by the Manufacturer. | | |
| R(11) | Tenderers are invited to Describe their organisation's standard Project Management process. | | |
| R(12) | Tenderers are invited to provide detail / evidence of any Project Management certifications. | | |
| R(13) | Tenderers are invited to describe their organisation's standard Quality Management process. | | |
| R(14) | Tenderers are invited to provide detail / evidence of any Quality Management certifications. | | |
| R(15) | Tenderers are invited to describe their organisation's standard Information Security management process. | | |
| R(16) | Tenderers are invited to provide detail / evidence of any Information Security certifications. | | |
| R(17) | Tenderers are invited to specify the number of projects which they have undertaken in the last three (3) years using a solution of the kind proposed in response to this ITT and the same manufacturer. . | | |
| R(18) | Tenderers are invited to identify 3 comparable projects (together with references) by answering Question 4 in Volume IA of this ITT. Please note that no additional response is required against this Requirement. | | |

| | | | |
|--------------|---|--|--|
| M(19) | Tenderers must confirm that they are able to quote prices in Euros (€) and that, if selected by ECMWF, Tenderers will be prepared to contract in Euros (€). | | |
|--------------|---|--|--|

A1.2. Presentation and Demonstration

| Requirements for Presentations, Demonstrations and Site Visits | | | |
|--|---|----------------------|------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| M(20) | If requested by ECMWF, tenderers must give a presentation of their tender at ECMWF in Reading. The date of the presentation will be made known following receipt of the tenders as per the ITT timetable shown in Table 1: Envisaged timeline for this ITT. | | N/A |
| M(21) | If requested by ECMWF, tenderers must provide demonstrations of the proposed solution or solutions. Arrangements for the time, location and exact content of the demonstrations will be made following receipt of tenders. | | N/A |

A1.3. Support Capabilities

The maintenance and support for the Management & Monitoring network switches should be delivered directly by the manufacturer and not via a partner. The service may be offered as a Management and Support contract or via a Lifetime Warranty offering and it needs to include as a minimum:

- Advanced Replacement of faulty hardware, with shipment within five (5) business days after an RMA has been issued;
- Software/Firmware update entitlement;
- Access to manufacturer’s Technical Support Service via e-mail or via a support portal for RMAs and Troubleshooting during business hours;

| Requirements for Support Capabilities | | | |
|---------------------------------------|---|----------------------|------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| R(22) | Tenderers are invited to provide a description of the manufacturer’s proposed warranty or support services and relevant terms and conditions, including: <ul style="list-style-type: none"> • process used to record, manage and report Incidents; • what methods can clients use to raise incidents with the manufacturer’s Service Desk; • first Response Times that the manufacturer is able to provide; • target resolution times that the manufacturer is able to provide; • time for permanent fix of an incident. • duration of the support/warranty • access to firmware/software entitlements • hours of support (24/7 or business hours, etc) | | |
| M(23) | Tenderers must confirm that a fault reference number or equivalent will be issued within no more than 5 minutes of a ticket being raised. | | |
| R(24) | Tenderers are invited to describe how an on-site professional services request will be handled, for example, how the effort is estimated and the lead time required from the time when a purchase order for the service is placed. | | |
| R(25) | Tenderers are invited to describe the processes in place to deal with delivery of equipment that may be: <ul style="list-style-type: none"> • “Dead on Arrival”; • incorrect; • shipped to the wrong address. | | |
| R(26) | Tenderers are invited to describe the manufacturer’s capability to supply spare parts and their associated SLAs and policies. | | |

| | | | |
|-------|--|--|--|
| R(27) | Tenderers are invited to describe what contingency plans are in place to continue the supply of spare parts after the failure of the normal sources of such parts. | | |
|-------|--|--|--|

A1.4. Professional Services

ECMWF will be responsible for producing the Low Level Design, the deployment and maintaining of the configuration files and the general topology.

ECMWF may require onsite engineer presence during the Deployment Phase1 to assist with the configuration and deployment work. The Tenderers are invited to propose their services to fulfil this need.

| Requirements for Professional Services | | | |
|--|--|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| D(28) | Tenderers shall state which professional services they can offer to support ECMWF during the Deployment Phase 1, including onsite engineer presence at ECMWF site in Bologna. | | |
| R(29) | Tenderers are invited to state if they can offer additional professional services such as: <ul style="list-style-type: none"> perform a firmware upgrade of all Management and Monitoring Network equipment at ECMWF site in Bologna; replace a management core switch at ECMWF site in Bologna. | | |

A1.5. Service Delivery and Acceptance Tests

As described in Schedule 4 of Volume III, the testing of the agreed solution for the Management and Monitoring Network infrastructure will be performed as follows:

1. The Contractor will perform the Functional Test at their premises on all equipment included on the BoM. The purpose of the test is to establish that the equipment is functional and that various aspects of its performance and behaviour are in accordance with the published specifications, the tender documents and the Contract. ECMWF together with the Contractor will agree the exact contents of the Functional tests, which should include:
 - a. Power on test: Make sure the device power can be powered on, including testing on all power supplies where applicable;
 - b. If not already on the latest manufacturer's recommended firmware, a firmware upgrade to the latest manufacturer's recommended firmware on all partitions/images;
 - c. Boot test: Boot the device on both images (primary/secondary);
 - d. Optic Transceivers ports: - Connect a 10G-SR SFP+ and a 10G-LR SFP+ on the relevant ports and verify that they are recognised by the system;
 - e. Check the system logs for any significant errors.
2. The contractor will arrange RMA any malfunctioning device if necessary;
3. ECMWF together with the Contractor will deploy the equipment included on the BoM for the Reading site in ECMWF's data centre located in Reading;
4. Following the completion of the deployment of the equipment, a User Acceptance Test period of at least 28 calendar days during which a batch of tests will be run to ensure that the functionalities required to fulfil the design of the agreed solution are fully functional. ECMWF together with the Contractor will agree the exact contents of the User Acceptance Tests;
5. Following the completion of the User Acceptance Test, the equipment included on the BoM for the Bologna site will be delivered in Bologna by the Contractor.

| Requirements for Service Delivery and Acceptance Tests | | | |
|---|---|-----------------------------|-------------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| M(30) | Tenderers must confirm that they will perform the Functional Tests as described above. | | |
| D(31) | Tenderers shall outline their proposed method of Project Management, their specific experience in applying that method of Project Management in a relevant environment and the composition of their Project Team. | | |
| M(32) | Tenderers must confirm their acceptance of Schedule 4 of Volume III that contains the standards of tests, which must be met by the equipment before ECMWF will accept it. | | |
| M(33) | Tenderers must commit to providing a delivery lead time for equipment when providing the quote pertaining to that equipment. | | |
| R(34) | Tenderers are invited to specify the lead time for delivery of equipment after a placement of the purchase order. | | |

Appendix 2 Technical and Operational Requirements

A2.1. Management and Monitoring Network - General description

The Management and Monitoring Network provides access to the OOBM ethernet interfaces of the HPN switches, firewalls, routers and the server Lights-Out-management interfaces. It allows for the connected equipment to be accessed for management and monitoring purposes. A small number of servers (less than 10), will also connect to the management network to offer access for the monitoring and management agents.

To address ECMWF's network design Requirements, the HPN will have two segregated IP Fabrics, one in each Data Hall. The Management and Monitoring Network will have two core Layer-3 switches in each Data Hall, which will be configured in a stack (or similar technology that the Tenderer may propose). The Access switches of each Data Hall, will connect to the relevant core switches, using Link-Aggregation (LAG, Link Aggregation Group) and Link Aggregation Control Protocol (LACP). Some of the access switches may require PoE+ capabilities to support VoIP phones and Wireless Access Points.

The management core will also have a connection to perimeter firewalls, which are out of scope of this ITT.

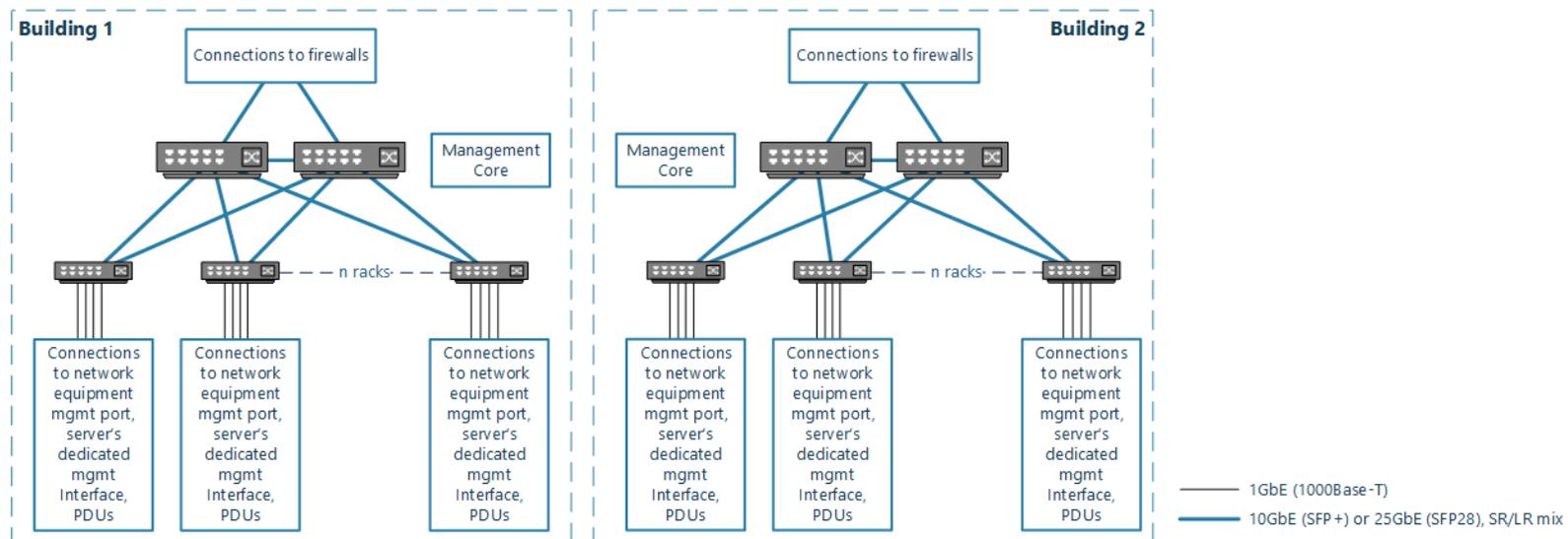


Figure 2: Management and Monitoring Network High Level Design

A2.1.1. Proposed solution description

| Fabric Layer - Requirements for the Proposed solution description | | | |
|---|---|----------------------|------------|
| Requirement number | Requirement | Detailed Description | Self-Score |
| M(35) | <p>Tenderer must provide a summary of the technical solution or solutions that they propose to:</p> <ul style="list-style-type: none"> fulfil the High Level Design description in paragraphs A2.1; meet the Requirements listed in spreadsheet "Volume II TechSpec". <p>More than one solution can be proposed. (The response to this Requirement must be no longer than 1000 words for each proposed solution but may also contain diagrams).</p> | | |
| M(36) | <p>Tenderers must complete the "Volume II TechSpec" spreadsheet annexed with this tender document.</p> <p>If more than one solution is proposed, then a separate "Volume II TechSpec" spreadsheet must be completed for each additional solution.</p> | | |
| M(37) | <p>Tenderers must describe the overall architecture with respect to recognition of failing hardware components and interaction between hardware components.</p> | | |
| R(38) | <p>Tenderers are invited to describe other aspects of the overall architecture and hardware including:</p> <ul style="list-style-type: none"> throughput; switching capacity; latency; | | |
| R(39) | <p>Tenderers are invited to state the forwarding performance of the Switches; they are also invited to identify the software features whose use may adversely affect this performance and indicate the performance impact.</p> | | |
| M(40) | <p>Tenderers must guarantee that software features specified as available in the Tendered solution or solutions are technically and operationally compatible, unless explicitly stated otherwise. Any such incompatibility must be described including any impact on system functionality.</p> | | |
| M(41) | <p>Tenderers must guarantee that software features required to provide the purposed solution or solutions are available for at least eight (8) years from the date of Contract signature.</p> | | |
| R(42) | <p>Tenderers are invited to describe any additional features not listed in the ITT as Requirements, which the Tenderer feels may be relevant and beneficial to the proposed solution or solutions.</p> | | |

A2.1.2. Management, Automation and other features

This section covers the management and monitoring aspects of the Management and Monitoring Network.

| Requirements for the Management and Monitoring Solution | | | |
|---|--|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| R(43) | Tenderers are invited to describe how orchestration and automation would be implemented in the proposed solution or solutions. | | |
| R(44) | Tenderers are invited to describe how performance monitoring would be implemented in the proposed solution or solutions. | | |

A2.2. Support and Training

A2.2.1. Support of the Tendered Hardware and Software

| Requirements for Support of the Tendered Hardware and Software | | | |
|--|---|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| M(45) | Tenderers must explicitly undertake to provide spare parts and support for the hardware and software acquired under this ITT in accordance with Schedule 3 of Volume III for at least for at least eight (8) years from the date of Contract signature. Where this involves an arrangement with the Manufacturer, responsibility for the provision of such support must in any case rest with the Tenderer. | | |
| R(46) | Tenderers are invited to describe their policy regarding maintenance, spare parts and support for the hardware, firmware and software of the Deployment Phase 1 on reaching their respective end of life. In particular, any replacement policy or policies for components that will no longer be supported should be stated. | | |

A2.2.2. Training

| Requirements for Training | | | |
|---------------------------|--|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| M(47) | Tenderers must provide training and knowledge transfer programme, given at ECMWF's Reading premises or elsewhere, which must provide up to 10 ECMWF operational staff with sufficient understanding of the working of the software and hardware being tendered to enable them to provide effective day-to-day and emergency operational support including documentation, administrative tools, performance analysis, software upgrades and changes to configuration files. | | |
| R(48) | Tenderers are invited to state which manufacturer's and/or tenderer's training programmes are available for ECMWF operational staff during the course of the Contract and state which of those have been included and costed on the BoM. | | |

A2.3. Transceivers and Cables

ECMWF would like to have the possibility to use non-OEM third-party transceivers. This section assesses the possibility and feasibility of doing so.

| Requirements for Transceivers and Cables | | | |
|--|---|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| M(49) | Tenderers must state what is their policy in regard to support of third party optic transceivers and direct attached cables. | | |
| M(50) | Tenderers must specify whether the use of third-party optic transceivers and direct attached cables is possible in the proposed solution or solutions. Tenderers must also state the manufacturer's policy in respect of such use. | | |
| R(51) | Tenderers are invited to provide details of how support incidents will be handled if third party optic transceivers and direct attached cables are being used on the Manufacturer's hardware. | | |
| M(52) | Tenderers must confirm that the optic transceivers and direct attached cables used in the propose solution or solutions are compatible with the proposed network equipment. | | |
| M(53) | Tenderers must confirm that the optic transceivers and direct attached cables used in the propose solution or solutions are compliant with the applicable relevant standards. | | |
| M(54) | Tenderers must confirm that each transceiver and direct attached cables is individually tested at the factory and again tested by the supplier after coding. | | |
| M(55) | Tenderers must confirm that in the event when optical transceivers and direct attached cables are excluded from support but purchased as part of the Contract, the optical transceivers and direct attached cables will fall under the standard warranty terms subject to the warranty period starting on time of purchase. | | |
| D(56) | Tenderers shall confirm that limited life-time warranty for the proposed transceivers and direct attached cables is five (5) years or more from time of purchase. | | |
| D(57) | Tenderers shall confirm that advanced product replacement for transceivers and direct attached cables is two (2) years or more from time of purchase. | | |
| R(58) | Tenderers are invited to provide information on failure rates of each transceiver and direct attached cables type of the proposed solution(s). | | |

Appendix 3 Pricing and Agreement

ECMWF expects to see full pricing transparency in your Tender response and to be able to understand the figures first time without the need to clarify with the Tenderer in question.

Where applicable, please ensure that all and any conditions and/or restrictions are made explicit e.g. unanticipated expenditures (rush charges, etc.) and including the net pass-through of third-party costs/commissions/discounts.

When providing full and transparent breakdown of any summary figures, the Tenderer must be specific on how these are derived i.e. unit costs, day rates, quantities, discounts, exchange rate, how personnel effort is split between phases of work, etc.

Pricing Requirements

Tenderers are required to quote prices on the following basis:

- a) Prices quoted by Tenderers in the Bill of Materials shall be firm and fixed;
- b) For the Deployment Phase 1 and its associated Bill of Material, prices are fixed and firm for three (3) months after the closing date from receipt of tenders and ECMWF can use these prices to place orders at Contract signature;
- c) For purchases beyond the Deployment Phase 1, guaranteed level of discounts from Manufacturers' prices for hardware and support will apply;
- d) The prices and discounts quoted against (c) can be used for any additional purchase orders placed by ECMWF beyond the Deployment Phase 1;
- e) Prices must be quoted in Euros (€) and ECMWF will use Euros (€) in the Contract.

| Requirements for Pricing and Agreement | | | |
|--|--|----------------------|--------------|
| Requirement number | Requirement | Detailed Description | Self-Scoring |
| M(59) | Tenderers must provide their pricing for the bill of materials using the Bill of Materials, "Volume II BoM" spreadsheet annexed with this tender document. Tenderers are invited to add as many lines as necessary to the spreadsheet to provide the pricing of all the elements required in the proposed solution. If more than one solution is proposed, then pricing must be provided for each solution using a separate spreadsheet. | | |
| M(60) | Tenderers must confirm that all related costs to cover all the Works under Deployment Phase 1 includes the following: <ul style="list-style-type: none"> • all Hardware and Software; • all software licences relating to the Works (if applicable); | | |

| | | | |
|--------------|---|--|--|
| | <ul style="list-style-type: none"> • all Maintenance and Support Services – you must also detail all the support level options and associated SLAs; • delivery; • acceptance testing • support during the stabilisation period after Deployment Phase 1, i.e.: “hypercare” (expected to be 6 months duration) • documentation and training. | | |
| M(61) | <p>For the Deployment Phase 1, Tenderers must confirm that prices:</p> <ul style="list-style-type: none"> • include the costs of the mandatory features as described in this ITT; • be quoted in Euros (€); • be inclusive of shipping, delivery; • be exclusive of all appropriate import duties and UK or Italian taxes; • be valid for three (3) months after the closing date for receipt of tenders; • state the level of discount off Manufacturer’s list price for supplying equipment; • state the level of mark-up off Manufacturer’s list price for supplying equipment. | | |
| D(62) | Tenderers that use a reference pricelist that is in a currency other than Euros (€) must provide the currency exchange rate or rates applied to obtain the pricing in Euros (€). | | |
| M(63) | Tenderers must quote firm and fixed prices that are valid for acceptance by ECMWF for three (3) months after the closing date for receipt of tenders. | | |
| M(64) | For purchases that are not part of Deployment Phase 1, Tenderers must give guaranteed levels of discount on the Manufacturer’s standard list prices for all components of the Works and describe how list prices can be periodically made available to ECMWF during the course of the Contract. | | |
| M(65) | For later purchases that will take place after the completion of the Deployment Phase 1, the Contractor’s quotes must be exclusive of all appropriate import duties and UK or Italian taxes. | | |
| M(66) | ECMWF would like to establish a framework with the tenderer for future purchases that are not part of Deployment Phase 1 and for the duration of the contract. Tenderers must give guaranteed levels of discount on the Manufacturer’s standard list prices for all components of the Works and describe how list prices can be periodically made available to ECMWF during the course of the Contract. | | |
| M(67) | Tenderers must provide quotes for different levels of the support services for the equipment listed in the “ Volume II BoM” spreadsheet provided for a period of three (3) years. | | |
| D(68) | In the case when third party optic transceivers and direct attached cables are used in the propose solution or solutions, Tenderers shall provide quote in the “ Volume II BoM” spreadsheet. Tenderers shall state the level of discount and mark-up off third party list price. | | |

