

DUTCH NATIONAL SUPERCOMPUTER

TENDER

COMPETITIVE DIALOGUE PROCEDURE

PRE-QUALIFICATION QUESTIONNAIRE

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Important notice

This Pre-Qualification Questionnaire (PQQ) defines the basis on which SURFsara will select Candidates for the Bidding Phase of the Supercomputer tender. In order to provide an indication of the envisioned partnership with the Supercomputer Partner as well as the products and services that SURFsara wishes to procure, chapters 1 and 2 contain various statements, estimates and projections with respect to the future Invitation to Tender, the Dialogue Phase and the Bidding Phase as currently foreseen by SURFsara. These statements, estimates and projections are the result of various assumptions.

Please note that these statements, estimates, and projections are subject to significant technical, business, economic, legal and competitive uncertainties and contingencies, many of which are beyond the control of SURFsara (which is the main reason why SURFsara decided on a Competitive Dialogue Procedure). Therefore, apart from Chapters 3–5, the information set forth in this document is likely to vary – and SURFsara reserves the right to deviate from this document in the actual Invitation to Tender.

Glossary

Procedural terminology	Definition
Bidding Phase	Phase of the Tender Procedure in which the Tenderers submit Proposals and awarding takes place.
Candidate	An organisation that submits a Qualification Submission. A Candidate can be a consortium.
Contract	Mutually accepted agreement between Contractor and Contracting Authority concerning the equipment and services to be provided, laid down in a document signed by both parties.
Consortium	A group of organisations within the meaning of article 4 of the EU Directive 2014/24/EC.
Contracting Authority	SURFsara, being SURFsara B.V. or its legal successor(s).
Dialogue Phase	Phase of the Tender Procedure in which the Contracting Authority and selected Tenderers discuss requirements, financial and legal terms for the Invitation to Tender.
Documentation	All documents released or exchanged between SURFsara and Candidate/Tenderer under this Tender Procedure, including but not limited to this Qualification Submission, Qualification Submission, Invitation to Tender, the Proposal, any Contract resulting from this Tender Procedure.
Invitation to Dialogue	Invitation to Tenderers to discuss the requirements, financial and legal terms in more detail with the Contracting Authority.
Invitation to Tender	Invitation to Tenderers to submit a Proposal for the provisioning of the Supercomputer and services.
Participant	A member of a consortium
Pre-Qualification Questionnaire (PQQ)	This document
Proposal	Tender submitted by a Tenderer during the Bidding Phase of the Tender Procedure.
Qualification Phase	Phase of the Tender Procedure in which Candidates will provide information to qualify for the Bidding Phase.
Qualification Submission	Requested documentation handed in by a Candidate to qualify for the Supercomputer Partner tender during the Qualification Phase.
Question and Answer process – Qualification Phase	The period during which Candidates can state questions and to which SURFsara will respond.
Question and Answer process – Bidding Phase	The period during which Tenderers can state questions and to which SURFsara will respond.
Selection Criterion	A criterion on the basis of which the selection (ranking) of Candidates will take place.

Subcontractor	An organisation (business firm) contracted to perform part of main contractor's contract. In relation to European Tenders it is to fulfil requirements (such as core competences) which the main contractor cannot fulfil on its own.
Supercomputer Partner	The Tenderer that will be awarded the Contract
Tenderer	A Candidate who qualifies for the Bidding Phase and is invited to submit a Proposal.
Tender Procedure	Process of awarding the contract for the Supercomputer Partner role via a Qualification, Dialogue and a Bidding phase in conformance with the European Procurement Directives
TOP500	TOP500 List of the world's most powerful supercomputers: https://www.top500.org/

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1 Introduction

SURFsara is seeking to purchase for a replacement for the current Dutch National Supercomputer Cartesius. The current system is a central and national high-end production facility which supports the diverse computational capability workload across a wide variety of scientific disciplines, ranging from theoretical chemistry and material science, climate modelling and atmosphere research, fluid dynamics, engineering, astronomy and earth sciences. The supercomputer currently serves some 370 active projects and more than 1150 active users, while SURFsara seeks to facilitate the use of HPC for a widening group of disciplines. The current system is an Atos/Bull bullx system extended with one Bull sequana cell. The procurement will seek to migrate the active user community onto the new system.

A five years Maintenance and Support contract will be included in the solution. In addition to the Supercomputer replacement, SURFsara might request for additional capacity, new functionality or improvements for the entire duration of the contract. This is subject to confirmation of funding. Additional capacity means additional components to the tender for SURFsara. Hence, SURFsara is seeking a Supercomputer Partner who will not only be capable to deliver the initial necessary equipment, but more importantly will partner with SURFsara in improving and increasing the Supercomputer to deliver computational services.

The specific technical, legal and financial issues with respect to the envisaged replacement of the Dutch Supercomputer will be discussed with the Tenderers in this Tender Procedure.

1.1 About SURFsara

SURFsara supports research in the Netherlands by developing and offering advanced and sustainable ICT infrastructure, services and expertise. SURFsara's services and infrastructure are necessary for top-level research and innovation.

SURFsara ensures this support by:

- providing an integrated ICT research infrastructure
- providing services in the areas of computing, data, visualization, networking, cloud and e-Science
- the provision of multidisciplinary expertise and support in ICT technology and applications
- doing all required innovation, engineering and development.
- Advanced infrastructure, services, support, innovation and development go hand in hand.

Our vision is:

- The Netherlands has a top ICT research infrastructure that is well integrated into the European e-infrastructure.
- For excellent research and innovation advanced ICT services and infrastructure are essential. Through cooperation with the institutions of SURF and NWO, the universities and research institutes in the Netherlands and abroad, we realize this vision.

SURFsara hosts the large Dutch national infrastructure services, i.e. the Dutch national Supercomputer service, the National Compute Cluster, large data storage facilities and services and all important national grid services. This includes also a large part of the infrastructure that is a Tier-1 site for CERN LCG.

SURFsara participates in a number of national and international HPC, e-science and grid activities. SURFsara is currently partner in the large European e-Infrastructure projects: PRACE, EGI.eu and EUDAT CDI; and partner in CompBioMed 2, EOSCpilot, EOSChub, ExaMode, HNSciCloud, HPC-Europa3, and ReaxPro.

SURFsara has a long history and a proven track record in providing HPC services to the Dutch research community. SURFsara provides for more than 35 years the national supercomputing service. Important focus is supporting users to enable grand challenge applications. SURFsara has built broad

expertise in the implementation and e-science support of grid infrastructures for the scientific research community. SURFsara provides also HPC-Cloud and Scalable Data Analytics services to support research.

The national supercomputer is part of the Dutch national ICT infrastructure for Research. The national e-infrastructure is under the governance and responsibility of SURF. SURF is the Dutch higher education and research partnership for network services and information and communication technology (ICT). The Dutch higher education and research institutions have been collaborating within SURF for the past 30 years on ICT innovation projects that go beyond what is possible at individual institutions. SURF also promotes knowledge exchange so that education and research can benefit more from the possibilities offered by ICT. Thanks to SURF, students, instructors, and researchers have access to the best possible Internet and ICT facilities.

The SURF cooperative consists of the cooperative office (SURF office) and three operating companies: SURFmarket, SURFnet and SURFsara. It is planned to merge the three operating companies into one legal entity in 2020. The offer from the bidder is intended for SURFsara and its legal entities as well as any legal entity that may be formed after 2020 by SURFsara and its entities.

1.2 Opportunities for the Supercomputer Partner

It is obvious that the installation and exploitation of a new supercomputer is a complex project. This is typically reflected in tender documents, which list various aspects of the requirements that will be posed on delivery of such a system. However, due to its complexity, there are various opportunities for vendors to distinguish themselves from other vendors by their approach to certain aspects of the new system. This subsection briefly discusses several of these opportunities, without being restrictive to the aspects mentioned here.

First is that the user base of the system is large, basically consisting of users from all Dutch universities and public research institutes. A wide range of applications will be run on the system. It is to be expected that some applications will perform better on one architecture, while others are more suited to a different architecture. A “mixture” including the best of both worlds may be an option, although there are many challenges with respect to data sharing and job scheduling, to name a few. Application performance is a key aspect, not only for the new system, but also with respect to future systems on the road to exascale performance. With the expected compute power of the system great emphasis and importance is put on scalability of applications. A substantial part of the user community consists of experts in particular fields of scientific computing and will port their own application codes to the new system. They will perform scaling experiments, seeking to exploit novel technologies that the vendor has brought to the system. This offers new opportunities for testing, validating, and improving such technologies and for collaboration with the Supercomputer Partner.

Another key aspect is that the new system will need to be integrated into the existing SURFsara infrastructure. With the increasing importance of data storage, data access, data analysis and visualization, a careful implementation of the new system is mandatory for uninterrupted access to data. Global file systems, not only within the supercomputer itself but also connecting other systems in the SURFsara infrastructure, will likely be an important factor to realise optimal data access.

A third aspect is the environmental aspect. Power usage and cooling requirements are becoming increasingly important, not only from a cost perspective, but also from the perspective of green IT, sustainability and societal responsibility.

It is for these reasons that the Supercomputer project provides opportunities for the Supercomputer Partner to propose innovative approaches. This may include any of the aspects described above, but is certainly not limited to those. Implementation of these approaches for instance could lead to agreements between SURFsara and the Supercomputer Partner with respect to collaboration and/or research in these or other areas.

1.3 Scope of intended Contract

The Supercomputer Partner will be contracted to design, deliver and implement the Supercomputer. More specifically the Supercomputer Partner will:

- Design the Supercomputer architecture/structure.
- Provide Supercomputer equipment, including related software.
- Install and configure the Supercomputer.
- Be responsible for the maintenance and support of the supplied Supercomputer hardware.
- Be responsible for support on installation, configuration, hardware and software issues to be provided to SURFsara.
- Act as a partner and stimulate further (innovative) improvement and further additions to the Supercomputer.

The result of this tender will be the awarding of a contract with the Supercomputer Partner to cover the above-mentioned activities. SURFsara has a budget of 20 M€ for five years. This budget includes the costs for data centre adaptations for power and cooling. VAT is excluded.

The implementation of the Supercomputer is expected to start Q4 2020.

Chapter 2 discusses the requested products and services in more detail.

Items that are explicitly not part of the Supercomputer Partner's activities include:

- Housing of the system;
- System administration;
- User support.

1.4 About the Tender Procedure

The issuing of this Pre-Qualification Questionnaire marks the start of the Tender Procedure of the Supercomputer Partner tender. The purpose of the tender is to select a Supercomputer Partner who will provide the Supercomputer solution that best contributes to the objectives of SURFsara, and will also fit best with the goals of the project.

This Tender is based on a **Competitive Dialogue Procedure** consisting of a Qualification Phase for selection of Bidders, a Dialogue Phase to discuss specific technical requirements, financial and legal terms for the Invitation to Tender, and a Bidding Phase where Tenderers are required to deliver their Proposals and the awarding of Contract takes place.

The purpose of the Pre-Qualification Questionnaire is to seek submissions from Candidates for the role of Supercomputer Partner. This document provides information about the envisioned Supercomputer, the opportunities for and the role and activities of the Supercomputer Partner and the Tender Procedure itself.

SURFsara will invite a maximum of five (5) Tenderers to submit a Proposal (see section 3.2) for the role of Supercomputer Partner. Candidates are required to submit their Qualification Submission ultimately:

March 30th, 2020 (12h30 CEST)

More detailed information about the planning of the Tender Procedure is provided in section 3.5.

1.5 Structure of the Pre-Qualification Questionnaire

This Pre-Qualification Questionnaire contains two major parts.

Part one provides a further introduction:

- Chapter 2 outlines the vision SURFsara has on the Dutch National Supercomputer.

Part two describes the procedural aspects of the Tender:

- Chapter 3 describes the tender procedure for the Candidates;
- Chapter 4 sets out the qualification and selection procedure;
- Chapter 5 describes the guidelines for participation.

2 Vision on the Dutch National Supercomputer

2.1 The current Cartesius Supercomputer

Cartesius is an Atos/Bull bullx system extended with one Bull sequana cell.

2.1.1 System Overview

Cartesius consists of a large number of batch nodes and a small number of special purpose nodes. For the batch nodes, we differentiate between so-called thin nodes, fat nodes, GPU nodes and Xeon Phi nodes. Thin nodes constitute the majority of the available batch nodes. GPU nodes use GPGPUs to accelerate the computations. The Xeon Phi nodes have Intel Many-Core CPUs. Fat nodes have more memory (256 GB) than the thin nodes and more physical cores (32) than most thin nodes.

Special nodes are the two interactive front end nodes and five so-called service nodes. The interactive front-end nodes provide the ssh login service and are meant for interactive work. The service nodes are meant for data staging (transfers to and/or from external contexts, such as the SURFsara archive facility or a remote site).

2.1.2 Detailed Node Description

The current system comprises:

- 1 thin node island, a so-called Bull sequana X1000 cell:
 - 177 sequana X1110 **thin nodes**
 - 2 × 16-core 2.6 GHz Intel Xeon E5-2697A v4 (Broadwell) CPUs/node
 - 64 GB/node
 - 18 sequana X1210 **Xeon Phi nodes**
 - 1 × 64-core 1.3 GHz Intel Xeon Phi 7230 (Knights Landing) CPU/node
 - 96 GB/node
- 3 thin node islands consisting of 360 bullx B720 **thin nodes** each
 - 2 × 12-core 2.6 GHz Intel Xeon E5-2690 v3 (Haswell) CPUs/node
 - 64 GB/node
- 2 thin node islands, one consisting of 360 bullx B710 **thin nodes** and one consisting of 180 bullx B710 **thin nodes**
 - 2 × 12-core 2.4 GHz Intel Xeon E5-2695 v2 (Ivy Bridge) CPUs/node
 - 64 GB/node
- 1 accelerator island consisting of 66 bullx B515 **GPGPU accelerated nodes**
 - 2 × 8-core 2.5 GHz Intel Xeon E5-2450 v2 (Ivy Bridge) CPUs/node
 - 2 × NVIDIA Tesla K40m GPGPUs/node
 - 96 GB/node
- 1 fat node island consisting of 32 bullx R428 E3 **fat nodes**
 - 4 × 8-core 2.7 GHz Intel Xeon E5-4650 (Sandy Bridge) CPUs/node
 - 256 GB/node
- 2 bullx R423-E3 **interactive front-end nodes**
 - 2 × 8-core 2.9 GHz Intel Xeon E5-2690 (Sandy Bridge) CPUs/node
 - 128 GB/node

- 5 bullx R423-E3 **service nodes**
 - 2×8 -core 2.9 GHz Intel Xeon E5-2690 (Sandy Bridge) CPUs/node
 - 32 GB/node

2.1.3 Nodes Summary

This totals up to:

- 47,776 cores + 132 GPUs: 1.843 Pflop/s (peak performance)
 - 25,920 Haswell cores (thin nodes): 1.078 Pflop/s
 - 12,960 Ivy Bridge cores (thin nodes): 249 Tflop/s
 - 5,664 Broadwell cores (thin nodes): 236 Tflop/s
 - 1,056 Ivy Bridge cores + 132 K40m GPUs (GPGPU nodes): 210 Tflop/s
 - 1,152 Knights Landing cores: 48 Tflop/s
 - 1,024 Sandy Bridge cores (fat nodes): 22 Tflop/s
- 130 TB memory (CPU + GPGPU + HBM)

2.1.4 Interconnect

For the batch nodes, we have introduced the concept of islands. Inside the bullx islands, the interconnect has a fully non-blocking fat-tree topology. Inside the sequana cell, the interconnect has a pruning factor of 2 : 1. Between islands, there is a pruning factor of 3.33 : 1 and the inter-island latency is 3 μ s.

Every bullx node has a Mellanox ConnectX-3 or Connect-IB (Haswell thin nodes) InfiniBand adapter providing $4 \times$ FDR (Fourteen Data Rate) resulting in 56 Gbit/s inter-node bandwidth. The GPGPU nodes have two ConnectX-3 InfiniBand adapters: one per GPGPU.

Every sequana node has a Mellanox ConnectX-4 InfiniBand adapter providing $4 \times$ EDR (Enhanced Data Rate) resulting in 100 Gbit/s inter-node bandwidth.

2.1.5 Disk Space

We have 180 TB for home file systems and we have some 7.7 PB Lustre (parallel) file systems for scratch and project space.

- 180 TB NFS home file systems (NetApp E5500), aggregate > 5 GB/s
 - 6 home file systems each > 15 TB, > 640 MB/s, ~ 1500 file creations/s
- 7.7 PB Lustre file systems (NetApp E5500 Soyuz / E5400)
 - scratch and project space > 5 TB/Tflop/s, > 0.15 GB/s / Tflop/s

2.1.6 Environmentals

The (HPL) power consumption of the system is about 900 kW. The compute racks use Direct Liquid Cooling (warm water cooling). In terms of floor space there are 45 racks.

2.2 The new National Supercomputer

Historically, the Dutch National Supercomputer has always been a general-purpose, production capability system, capable of running a wide range of applications with high performance and in an efficient way. Generally speaking, the new National Supercomputer is expected to be a system which will be based on similar principles. On the other hand, both technology and application requirements evolve, which means that the new National Supercomputer will need to pay attention to these aspects, for the ultimate benefit of the total user community of the system. With the advent of Cartesius we introduced a modest accelerator island providing GPGPUs.

First, it is required that the new National Supercomputer is a mature capability system again. This implies high performance requirements to processor cores, memory subsystem, I/O architecture and global interconnect between the nodes of the system. The software stack should be such that the high-performance hardware features will be optimally used, while offering user-friendly user interfaces. The system, including its associated file systems and data storage environment, will need to be reliable and stable.

Secondly, a uniform and symmetric system is most easy to use and to manage. However, such a system may not be most budget efficient. For instance, when certain applications require large memory, it may suffice to equip only a few nodes with more memory. Similar considerations may hold for I/O bandwidth requirements. Depending on application performance and expected work load, the new National Supercomputer may feature such node configurations, leading to a non-uniform system. SURFsara is open to consider these possibilities.

With respect to non-uniformity, several possibilities are being considered by SURFsara. SURFsara is very much interested in establishing a unified computing architecture, where several compute clusters might be consolidated in the national supercomputer. We will start integrating the existing LISA cluster: a generic x86 compute cluster that also includes ‘single precision GPUs’ (i.e. non-server grade GPUs). Furthermore, this might include but is not limited to: several services that are currently running on several smaller clusters: grid, big data / analytics and HPC cloud. Apart from this, due to the wide range of applications to be run on the new system, it can be expected that there is not one single system that will be optimal for all applications. As a result of this, a more heterogeneous solution may be a way to cope with this.

An HPC cluster, by its very essence has a low latency and high bandwidth interconnect for inter-node traffic. To enhance the usability of the new system for more throughput-oriented workloads, the system must be uplinked to SURFsara’s core routers with the same bandwidth that the site is uplinked to the Internet at large. Ideally, routed IP over interconnect, can be as a means to complement high peer to (external) peer bandwidth needed for such workloads. For this purpose, as well as some other workloads we are also considering to have fast node-local storage in (a subset of) the cluster’s nodes.

In the current system, only a very small fraction of the nodes has accelerators, this will be increased substantially, but the majority of the nodes is still expected to be CPU-based.

With the expected compute power of the system, great emphasis and importance is put on scalability of applications. Also, extensive parameter studies with a workload characterised by a large number of medium-sized jobs have become common in a number of scientific disciplines. Application performance and application scaling are therefore the most important aspects and selection criteria of the new system. This also means that theoretical peak performance of the new system will be of less importance. The procurement therefore will contain a benchmark with a limited number of real applications that are considered very important for the future workload of the system.

Overall the application throughput (performance) in relation to the total costs of ownership will be a main criterion for the selection of the new system. Power usage and cooling requirements are becoming increasingly important, not only from a cost perspective, but also from the perspective of green IT, sustainability and societal responsibility. Apart from these reasons, a large part of the system should use (warm) water cooling since it won’t be possible to provide sufficient air cooling for the envisioned electrical power budget.

With the budget of 20 M€, being somewhat more than the fairly constant 17 M€ over all generations of Dutch national supercomputers, SURFsara has always been able to touch a #50 position in the TOP500 (see). During the lifetime of the new National Supercomputer, SURFsara expects to reach at least a #50 position with an aggregate HPL performance of at least 20 Pflop/s.

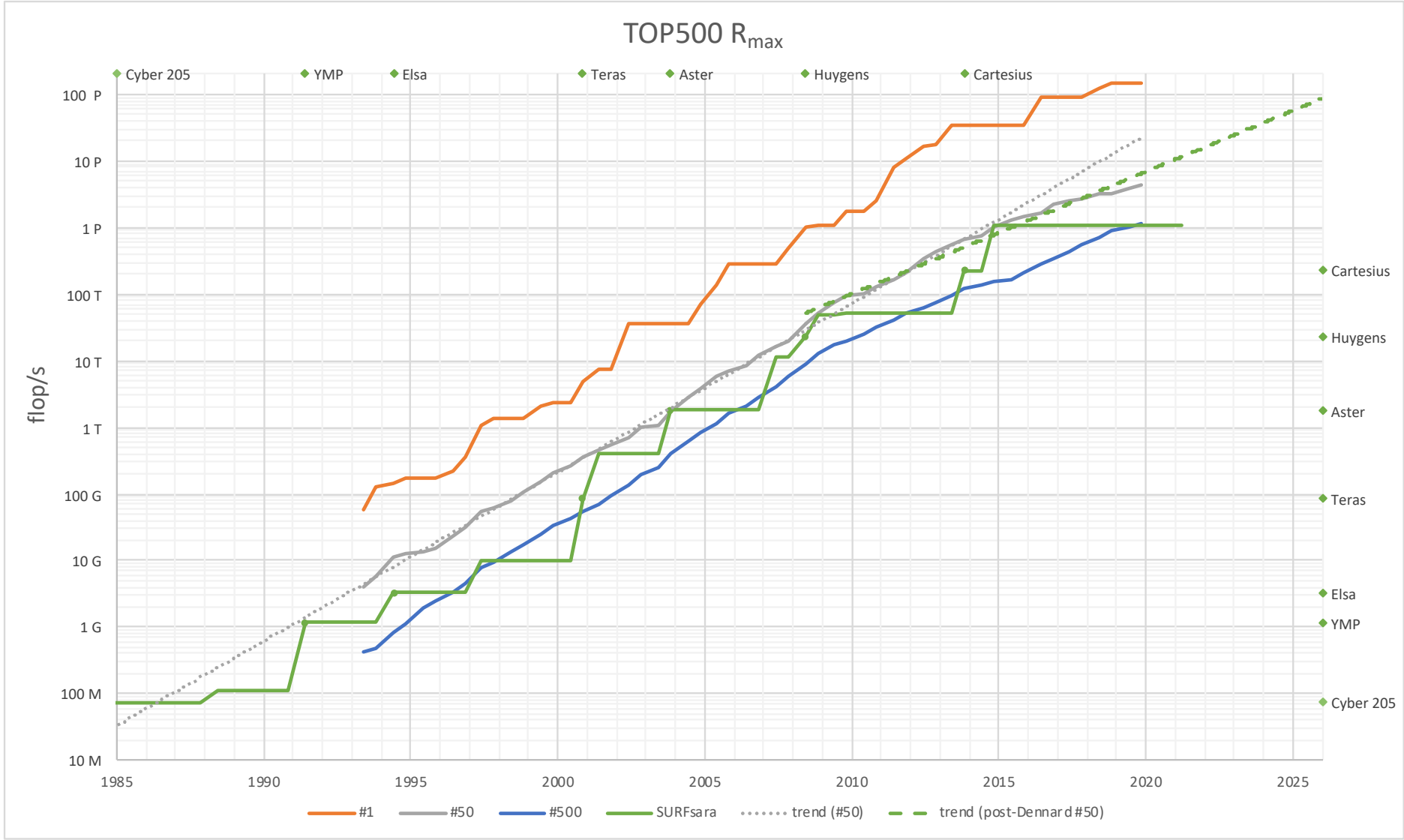


Figure 1 TOP500 ranking of the Dutch National Supercomputer

3 Tender procedure

3.1 General

The Supercomputer Partner will be contracted via a **Competitive Dialogue Procedure** under the Dutch Public Procurement Act (Aanbestedingswet 2012, revised 1 July 2016) which implements Article 30 of the Council Directive 2014/24/EU of 26 February 2014 in Dutch Law.

The Tender Procedure consists of three main phases:

1. The *Qualification Phase* in which the Candidates are selected for the Dialogue Phase.
2. The *Dialogue Phase* in which the Tenderers are invited to discuss the exact details of the requirements, financial and legal terms.
3. The *Bidding Phase* in which the Tenderers are required to deliver their Proposals, after which the economically most advantageous Proposal will be awarded a Contract.

The Qualification Phase, Dialogue Phase and the Bidding Phase are described in sections 3.2, 3.4 and 3.4 respectively. The timetable for the Tender Procedure is provided in section 3.5.

3.2 Qualification Phase

In order to participate in the Tender Procedure a Candidate must submit its Qualification Submission in the form of completed Annexes, including the required supporting documentation and proof, if needed. If the Candidate is a Consortium, or makes use of a Subcontractor, parts of the Annexes must be filled in by all Participants and/or Subcontractors. This is further defined in section 5.2 and in Annex A.

During the Qualification Phase, it will be determined which Candidates will be invited to participate in the Dialogue and Bidding Phase in six steps:

1. A Candidate must submit the Qualification Submission according to the guidelines in chapter 5.
2. SURFsara will assess completeness and check that the guidelines are followed. If the Qualification Submission is incomplete or not according to the guidelines, SURFsara is entitled to exclude the submission unless the incompleteness may be qualified as an omission which can be repaired by a clarification. SURFsara is under no obligation to ask for clarification.
3. When the Qualification Submission is complete and according to the guidelines, the selection committee will apply the exclusion criteria as described in section 4.2 and determine whether the Candidate qualifies for Tendering. If any of the circumstances of the exclusion criteria apply to the Candidate or its Participants, SURFsara will exclude the Candidate.
4. For all Candidates who are not excluded in step 3, the requirements regarding Candidate's technical and professional capacity (4.3) will be assessed. If the Candidate does not comply with the minimum requirements, SURFsara will exclude the Candidate.
5. SURFsara will count the number of Candidates that qualify according to steps 1 through 4. If more than five (5) Candidates qualify, all these Candidates will be assessed further as described in section 4.4.
6. The selection committee will then rank the Candidates on the selection criteria as described in section 4.4. Based upon this ranking the five (5) best ranking Candidates will be selected, i.e. the Candidates who have the highest ranking.

The selected Candidates (Tenderers) will be invited to the Dialogue Phase according to the Invitation for Dialogue that will be remitted to the selected Candidates only.

SURFsara reserves the right to investigate and verify correctness of information provided by the Candidates, but assumes no obligation to do so. This may be done during the Qualification Phase or in a later stage. If verification demonstrates, to the opinion of SURFsara, that the information provided by the Candidate is incorrect, became incorrect, or cannot be confirmed, SURFsara will exclude this Candidate from the Tender Procedure.

3.2.1 Clarification questions

During the Qualification Phase questions for clarifications from organisations considering taking part in the tender will be answered. Clarification has to be requested via the TenderNed platform¹ (www.tenderned.nl), or, in case the TenderNed platform fails, as a fall-back via e-mail to the tender email address (see below). Any comments regarding the procedures must also be submitted as soon as possible, but no later than the due date for questions as stated in the timetable in section 3.5 in order to ensure an adequate answer and to prevent a forfeiture of rights (see section 5.1.4) but no later than the due date for questions as stated in the timetable, in order to ensure an adequate answer and to prevent a forfeiture of rights. Please note that if you believe that your question must be handled as an individual question in TenderNed, Candidate must provide a solid explanation why disclosure of the answer could harm the economic interests of the Tenderer.

A document that lists all questions and answers will be published without mentioning the names of the inquiring parties. Only the answers provided in that document represent SURFsara's response to the inquiring parties; answers provided in any other way will be deemed invalid.

3.2.2 SURFsara tender contact person

Direct communication regarding this Tender Procedure will take place with the contact person (liaison) of SURFsara exclusively. Violation will lead to exclusion from the Tender Procedure.

Contact person on behalf of SURFsara is:

Walter Lioen
Unit Manager Compute Services
SURFsara

E-mail: supertender@SURFsara.nl

3.2.3 Tender related complaints

SURFsara is committed to public sector best practice. Competitive public sector processes are governed by EU law and Dutch legislation. If you are of the opinion that SURFsara, in dealing with this tender, is not abiding by the applicable rules, please contact SURFsara via the contact person as stated in paragraph 3.2.2. If this does not result in a satisfactory answer, you are entitled under the SURF Regulation on Handling Tender-Related Complaints 2014² to lodge an objection with the Complaints Committee via: klachtencommissie.aanbestedingen@surf.nl.

Please note that any questions you may have relating to the scoring of your Qualification Submission and or Proposal leading to a qualification or awarding decision of SURFsara, are best dealt with by the contact person of SURFsara for this Tender Procedure. In this case please contact the contact person as indicated in paragraph 3.2.2 for either a personal meeting or teleconference for a clarification on the given scores and awarding decision based on the scores. If after this clarification, you cannot abide by such clarification, Candidate should submit its objections by having commenced interlocutory proceedings before the competent court in Amsterdam.

3.3 Dialogue Phase

It is foreseen that the Dialogue Phase consists of two consecutive rounds, starting from an initial set of requirements as described in the Invitation to Dialogue document, and inviting Tenderers to comment

1 Take note that (free) registration at TenderNed is required to submit questions regarding this tender. Registration is also required for digital submission.

2 The 'surf-regelulation-on-handling-tender-related-complaints-2014_en.pdf' is available here: <https://edu.nl/hgygp>

on it by marking up the solution as the basis of the dialogue. During the first dialogue session Tenderers will be asked to provide their provisional ideas on the open issues regarding the requirements, legal and financial terms. During the second dialogue session, the requirements, legal and financial terms will be discussed and made into a definitive Invitation to Tender.

Please take note that Tenderers are expected to provide their application benchmark results during the second dialogue session. Application benchmark profiles and codes will be available to enable Tenderers to prepare for the benchmark calculation.

After the dialogues, SURFsara will use the information as provided by the Tenderers and its own findings to further detail the requirements and prepare the Invitation to Tender document.

3.4 Bidding Phase

The Bidding Phase consists of two separate steps:

- Tendering (preparing and submission of Proposal);
- Assessment of Proposals, and awarding of the Contract.

3.4.1 Tendering

The tendering starts with sending the Invitation to Tender to the Tenderers who, based on the result of the Dialogue Phase will be able to offer a solution which fulfils the requirements as set out during the Dialogue rounds. Tendering ends at the due date for Proposals. The Invitation to Tender will include the minimum requirements and specifications of the Supercomputer and related services requested as well as the awarding criteria. Questions for clarification can be brought forward and will be answered without disclosing the origin of the question.

3.4.2 Assessment and awarding

After receipt of Proposals each Proposal will be examined and evaluated by an evaluation committee of SURFsara, on the basis of minimum requirements and awarding criteria, as stated in the Invitation to Tender.

Following the assessment of Proposals, SURFsara will award the Contract to the Tenderer with the economically most advantageous tender, based upon the awarding criteria.

A clarification request may be part of the awarding procedure.

3.5 Timetable

The following timetable provides information concerning the planning of the tender. From item “e.” onwards the provided dates are indicative.

Qualification Phase:

- | | |
|--|----------------------------------|
| a. Publication of Notice and Pre-Qualification Questionnaire | February 18 th , 2020 |
| b. Due date for questions for clarification | March 5 th 2020 |
| c. Publication of clarifications | March 16 th , 2020 |
| d. Due date for Qualification Submission | March 30 th , 2020 |
| e. Selection of Tenderers (date indicative) * | April, 2020 |

Dialogue Phase (all dates are indicative):

- | | |
|-----------------------------------|-------------|
| f. Sending Invitation to Dialogue | April, 2020 |
| g. Start of dialogues | May, 2020 |

Bidding Phase (all dates are indicative):

- | | |
|--|-----------------|
| h. Sending Invitation to Tender to Tenderers | July, 2020 |
| i. Due date for questions for clarification | August, 2020 |
| j. Publication of clarifications | August, 2020 |
| k. Due date for Proposals | September, 2020 |
| l. Assessment of Proposals | October, 2020 |
| m. Announcement of award decision* | October, 2020 |
| n. Awarding of the contract | November, 2020 |

* Each decision concerning the selection of Candidates/Tenderers or contract award is followed by a 20 day stand still period

4 Qualification and selection of Candidates

4.1 Introduction

To assess whether a Candidate qualifies for the Supercomputer Partner Tender, SURFsara has defined the guidelines for submission of a Qualification Submission in chapter 5. If the Qualification Submission is delivered according to these guidelines, criteria for qualification and selection will be assessed.

First, the Qualification Submissions will be assessed against the exclusion criteria, as defined in section 4.2. For those Candidates that are not excluded, requirements regarding Candidate's economic and financial standing, technical and professional capacity and other minimum requirements will be assessed. All Candidates that meet the minimum requirements qualify for selection. If more than 5 Candidates qualify, the qualifying Candidates will be assessed on the selection criteria in section 4.4. Eventually, five (5) Candidates will be selected according to the selection procedure in section 4.5.

Any statement in the Qualification Submission, which subsequently turns out to be incorrect or turns out to contain promises that cannot be fulfilled, will be considered as a 'false' declaration and may determine the exclusion of the Candidate from further participation in this Tender Procedure.

Note that at the time of awarding of the Contract, the Candidate must not be in any of the circumstances defined in section 4.2 and MUST comply with the suitability requirements defined in section 4.3.1. This also applies in the case of a Consortium and/or subcontracting. SURFsara will exclude the Candidate, should this not be the case.

4.2 Exclusion grounds (Minimum Requirement)

MR 1. European Single Procurement Document

The European Single Procurement Document (ESPD) is a self-declaration form used in public procurement procedures by public buyers and businesses in the EU. Candidate must fill-out and dully (digitally) sign this form using the Negometrix tender platform. For reference the pdf version is attached as Annex D.

In case of a Consortium and/or Subcontracting, all **Participants and/or Subcontractors MUST** fill-out and upload their European Single Procurement Document.

The Tenderer awarded with a Contract may be asked to provide documents of proof before signing of the Contract. If this Tenderer fails to provide the aforementioned document, he will be excluded.

4.3 Suitability requirements (Minimum Requirements)

The suitability of Candidates regarding their technical and professional ability will be evaluated and verified in accordance with the information requested in this section.

Technical and professional capacity of Candidates will be evaluated and verified in accordance with the requested information in the following section.

Core competences

In order to proof a Candidate's technical and professional capacity, Candidates must have the core competences as specified in the table below, to carry out the tasks involved in this Tender.

Table 1: Core competences regarding technical and professional ability

MR	Core competence	What is minimal required
MR 2	Design and implementation of state-of-the-art Supercomputer solutions.	Design and implementation of at least two state of the art Supercomputer solutions which: are within the first 100 of the TOP500 list*
MR 3	Installation and service support in Europe of a state-of-the-art Supercomputer solution.	Installation and service support of at least one state of the art Supercomputer solution with: - installation and service support in Europe (i.e. European Economic Area including Switzerland and the UK) AND - a ranking within the first 100 of the TOP500 list*

*About the ranking within the TOP500³ list of supercomputers, compliant is:

- A finished project that is listed in the first 100 of the November 2019 TOP500 list;
OR
- A finished project that is no longer listed in the first 100 of the November 2019 TOP500 list but newly appeared in the first 100 of the: TOP500 list of June 2017, November 2017, June 2018, November 2018, or June 2019;
OR
- A recently or not yet finished project which has no ranking in the latest (November 2019) TOP500 list, but is expected to have one in the first 100 of the coming June 2020 TOP500 list;
OR
- A project that for some reason was not listed in the (first 100 of the) November 2019 ranking but should have been ranked based on its computational power, will also be accepted, provided that Candidate is able to proof such assumptions.

Candidate MUST provide a list of project references of Candidate's supercomputer systems compliant to MR2 and respectively compliant to MR3. Please refer to Annex E and Annex F.



Please note the following:

- Candidate may rely on third parties to fulfil the core competences, but MUST in such case formally join forces as a consortium and/or through subcontracting (please refer to section 5.2).
- That to verify the project references as valid, Candidates MUST supply on SURFsara's first request a declaration from the customer, stating that the solutions and/or services of the project reference have actually been delivered.

MR 4. Support office

In order to demonstrate Candidate's ability to provide support services in the Netherlands in due time, Candidate must have a support office within Europe (i.e. the European Economic Area including Switzerland and the UK) with sufficient duly qualified support staff available to SURFsara (please refer to Annex G).

3 www.top500.org

4.4 Selection criteria

Next to the Minimum Requirements on technical and professional capacity, Candidate is asked to provide additional information on the following subjects. This will be used for the selection of Candidates, in case more than five (5) Candidates meet the Minimum Requirements.

SC 1. Showcase reference – supercomputer design, implementation and support

Candidate should provide exactly one reference that best demonstrates that Candidate has the technical and professional ability to partner with SURFsara in the design, implementation and service support of a supercomputer solution. Candidates are advised to provide compact and concise descriptions in their showcase reference at least clearly addressing the following aspects:

- Architecture including interconnect;
- Computing capabilities, expressed in LINPACK Efficiency (to be 60% or up);
- Size and design of data storage;
- Energy efficiency and (water)cooling efficiency;
- Scalability and extensibility over its lifetime, thereby considering the resulting power envelop of the system;
- Collaboration and/or research on new innovations to the system;
- Support and maintenance, including incident handling, escalation, and quality assurance.

Please refer to Annex H, and please use concise wording in 3 pages or less.

Evaluation: best match with the envisioned new Dutch National Supercomputer as described in section 2.2.

SC 2. Project references – supercomputer listings in TOP500

Candidate is asked to provide a list of:

- Supercomputer systems that were delivered and installed by Candidate and which are currently (November 2019 listing) listed in the first 100 of the TOP500.

Please refer to Annex I.

Evaluation: most listed systems in the first 100 of the TOP500 of the November 2019 listing.

4.5 Selection procedure

To limit the number of Candidates that will be invited to the Dialogue Phase to a maximum of five (5), SURFsara will set up an evaluation committee of at least three people which will score all Candidates meeting the Minimum Requirements using the Selection Criteria as described in section above.

The selection is based on a ranking per selection criterion. Ranking on selection criteria will be done by comparing Candidates on each criterion and then positioning the Candidates in order of the measurement result for that criterion. The Candidate that has the most favourable measurement for a criterion will get rank number 1, the Candidate with the next most favourable measurement will get rank number 2, until all Candidates are ranked according to the same principle. If Candidates have the same measurement for a criterion, they will get the same rank number. From there the ranking continues: e.g. 1, 1, 3, 4, etc. Candidates that have provided insufficient information for ranking will be ranked as last.

Next, the rank numbers of the selection criteria will be added up, resulting in an overall rank.

The ranking procedure will take place in several steps:

1. Each expert of the selection committee will individually assess each Candidate on the selection criterion SC 1 by use of the measurement criteria, and rank the Candidates accordingly.
4. At least one expert of the selection committee will assess each Candidate on the selection criterion SC 2 by use of the measurement criteria, and rank the Candidates accordingly.
5. The results of the assessments per criterion are discussed in a group session, leading to an agreed ranking on each of the selection criteria per Candidate;
6. The results of step 3 are added up resulting in an overall rank (sum);
7. The five (5) Candidates with the lowest sums from step 4 will be selected. If this step leads to more than five (5) Candidates because there are multiple Candidates in the fifth place in the ranking after step 3, then out of these Candidates the Candidate ranked best on criterion SC 1 will be selected. If after this step there are still multiple Candidates in the fifth place, then the Candidate ranked best on criterion SC 2 will be selected, if after this step there are still multiple Candidates in the fifth place, the fifth Candidate will be selected by drawing of lots.

SURFsara will inform all Candidates whether they have been selected or not. Candidates that have been selected will receive the Invitation to Dialogue. If Candidates have objections against the result of the Qualification Phase, these Candidates should ultimately submit their objections by having commenced interlocutory proceedings before the competent court in Amsterdam, the Netherlands within 20 days after the date of their formal rejection by SURFsara. If no such proceedings are commenced on time and in this manner, a Candidate will forfeit any right to institute proceedings against SURFsara regarding the decision concerned.

5 Guidelines for participation

5.1 General

5.1.1 Completeness and correctness of information

The Qualification Submission must contain all requested documentation and information and any other document that the Candidate wishes to include or to refer to. By submitting a Qualification Submission, the Candidate agrees that SURFsara is entitled to investigate all information provided by the Candidate in its Qualification Submission, immediately or later in the course of the procedure, concerning the correctness of the information. If the Candidate refuses co-operation or provides incorrect information, SURFsara is entitled to exclude the Candidate from the Tender Procedure.

5.1.2 Confidentiality and publicity

All submissions will be treated confidentially. Candidate is not allowed to share any confidential information concerning this project to third parties, except in the case of contracted associate parties, Subcontractors and/or helping hands. In all cases, Candidate will be responsible for imposing the same confidentiality obligations to such third parties while Tenderer holds responsibility for complete project confidentiality. Without written consent from SURFsara, no publicity is to be given to this project.

Information contained in submissions shall be deemed confidential, but shall not entitle Candidate or Tenderer having submitted it to any claims or property rights thereto.

5.1.3 Non-disclosure agreement

SURFsara is taking the utmost care and is very careful with the information provided during all phases of this Tender Procedure. All information provided to SURFsara is treated as confidential and will not be disclosed to other parties outside the SURFsara tender team. If Tenderer wishes SURFsara to sign a non-disclosure agreement in order to outline confidential material, SURFsara is willing to do so. In such case, please contact SURFsara via the contact person as stated in paragraph 3.2.2.

5.1.4 Errors and ambiguities

This document has been drafted with great diligence. If any errors or contradictions are observed, please contact SURFsara (see paragraph 3.2.1) stating the possible contradictions or proposed corrections before the due date for questions as shown in the timeline in section 3.5 on penalty of forfeiture of rights.

The technical expressions and abbreviations used in this document are considered to be known by Tenderer. In the case of any ambiguity, please contact SURFsara stating the possible contradictions and/or proposed corrections before the due date for questions as shown in the timeline.

SURFsara will respond to these inputs as part of the Question and Answer process, stating whether and in what way the document shall be amended.

5.1.5 Language

English will be the working language for the entire Tender procedure and the Contract. Supporting documents in Dutch language will be accepted. Dialogue sessions may take place in Dutch if all participants agree.

5.1.6 Compensation

SURFsara shall not compensate or be liable for any compensation with respect to the issuing of Requests for Participation. Moreover, correspondence, Qualification Submissions and Proposals will not be returned.

5.1.7 No obligation to award the contract

Completing the procedure of this tender in no way imposes on SURFsara an obligation to award the contract.

SURFsara disclaims any and all liability for costs or losses you may incur in relation to this procurement procedure, the premature termination thereof, your participation therein, or your exclusion thereof.

5.1.8 Acceptance of tender conditions

By submitting a Qualification Submission, Candidate agrees to all conditions stated in this document.

5.1.9 Applicable law and competent court

The Tender Procedure as well as any Contract resulting from the Proposal are subject to Dutch law.

The competent Court of Amsterdam (in the Netherlands) shall resolve all disputes arising between SURFsara and Tenderer(s) or other third parties in connection with the Tender Procedure as well as any contract resulting from this Tender Procedure.

5.2 Registration through a joint Proposal or sub-contracting

Companies wishing to participate in this Tender Procedure can join forces as a consortium, or through subcontracting. In most cases for reasons to fulfil the suitability requirements through relying on the capabilities of other companies. Both joint submissions and subcontracting are allowed in response to this Pre-Qualification Questionnaire. This must be made clear through the self-declaration form (see Annex D). Companies may also combine both approaches. However, any company can only be part of one Candidate and its respective Qualification Submission.

In any case, the Qualification Submission must specify clearly whether each company involved is acting as a Participant in a group or as a Subcontractor (this also applies if the various companies involved belong to the same group, or even when one is the parent company of the others). The Candidates must describe how their co-operation will be organised in order to achieve the expected results. This description of the organisation must cover technical, legal as well as administrative/financial aspects.

In any event, joint submissions will be treated in the same way as any other Qualification Submission, each being assessed on their own merits in relation to the criteria and the evaluation procedure set out in this document.

Please note that any company, either as (solo) Candidate, Participant, or Subcontractor, can only be part of one Qualification Submission.

5.2.1 Joint submission

A Qualification Submission jointly submitted by a consortium of two or more companies is a joint submission. If awarded the contract, the Participants of the consortium shall be jointly and severally liable towards SURFsara for the entire Contract.

In its Qualification Submission, the consortium (Candidate) shall issue a statement (see Annex B) in which it is made clear (i) what the need is to co-operate with each other and (ii) which Participant will be assigned to act on behalf of the consortium and to carry out all the contacts with SURFsara. This statement shall be the basis of the agreement between Participants before they are awarded the Contract.

The joint submission has to be signed by all Participants. Alternatively, Participants may issue a power of attorney to another Participant. In that case the relevant declaration must be attached to the Qualification Submission.

The assigned Participant will be responsible for the delivery of one integral Qualification Submission on behalf of all Participants of the Consortium.

All Participants, however, must sign the Contract if awarded.

5.2.2 Subcontracting

Certain tasks described in the Contract may be entrusted to Subcontractors, but the principal Contractor remains fully liable towards SURFsara for the performance of the Contract as a whole.

Accordingly, SURFsara will treat all contractual matters, including payments and liability, exclusively with the principal Contractor, whether or not a Subcontractor performs the tasks.

Under no circumstances can the principal Contractor avoid liability towards SURFsara on the grounds that the subcontractor is in default.

If subcontracting is proposed, the roles, activities and responsibilities of Subcontractor(s) must be clearly described (see Annex C), and a signed letter of intent by each Subcontractor stating its intention to collaborate with the Tenderer if he wins the Contract shall be included.

During execution of the Contract, the principal Contractor will need SURFsara's explicit authorisation to replace a Subcontractor with another and/or to subcontract tasks for which subcontracting was not envisaged in the original Qualification Submission.

5.3 Qualification Submission

5.3.1 Submission of the Qualification Submission

The Proposal may only be submitted digitally.

The address for digital submission is: www.tenderned.nl.

When digital submission of (parts of) Candidate's Qualification Submission is not possible through TenderNed, Candidates can apply for a so-called SURFfilesender voucher to upload their files to a specific SURFsara drive. Please -timely- contact the SURFsara tender contact person.

Online help from TenderNed to submit digitally is available at their website, phone 0800-TenderNed or email servicedesk@TenderNed.nl.

Guidelines or other helping documents are also available at TenderNed.nl.

It is the sole responsibility of the Candidate to have the Qualification Submission submitted before the deadline.

5.3.2 Validity of Submission

The Qualification Submission must be valid for at least nine (9) months following submission (see Annex A for instructions) and may be accompanied by a legally signed cover letter, signed by an authorised signatory registered at the Chamber of Commerce. The legally signed cover letter will be considered as the legal signing of Candidate's integral Qualification Submission, which also includes the European Single Procurement Document. In case the signatory is not registered, a document must be provided proving that the signatory is authorised to represent the company. This document must be no older than 3 months.

In case a cover letter is not part of the submission the European Single Procurement Document(s) must be legally signed.

5.3.3 Format of the Qualification Submission

All Candidates are required to provide information according to a prescribed format, which is the major guideline for the submission of information. The structure for the Qualification Submission is given in Annex A.

Annex A. Checklist for the Qualification Submission

All Candidates MUST submit their Qualification Submission according to the format below. Where requested in the Qualification Submission, Candidate must make use of the prescribed formats (Annexes) for delivery of requested information and re-label these accordingly. In cases where supplemental documents are requested in the Qualification Submission and/or the Annexes, Candidate should add these.

This document has been added to the Qualification Submission as file: 'Annex_A_Checklist'

Pre-Qualification Questionnaire			Qualification Submission		
Assessment of:	§	Input form:	Requested evidence:	Filename:	Check
Legal signing of Qualification Submission	5.3.2	Free format	Signed cover letter ⁴	Cover letter	☐
Validity of Qualification Submission	5.3.2				☐
Completeness of Qualification Submission	5.3.3	Annex A	Checklist	Annex A	☐
The way the co-operation will be organised and which Participant will be assigned to act on behalf of the Consortium.	5.2.1	Annex B	Statement of joint submission ⁵	Annex B	☐
Roles, activities and responsibilities of Subcontractor(s) and intention for collaboration	5.2.2	Annex C	Description of subcontracting and signed letter of intent by each Subcontractor ⁶	Annex C	☐
Exclusion grounds (MR 1)	4.2	Annex D ⁷	European Single Procurement Document ⁸	Annex D	☐
Candidate's compliance to Core competence (MR 2)	4.3	Annex E	List of project references compliant to core competence MR2	Annex E	☐

4 **Please note** that in case of a consortium the cover letter MUST be signed by all Participants. Alternatively, Participants may issue a power of attorney to another Participant. In that case the relevant declaration MUST be attached to the Qualification Submission.

5 In the case of submission through a consortium.

6 In the case that a Candidate relies on another organisation (i.e. Subcontractor) to fulfil one or more suitability requirements and/or selection requirements.

7 This document has been added to the Qualification Submission as a separate (xml) file in TenderNed.

8 **Please note** that in case of a consortium and/or subcontracting, all Participants and/or subcontractors MUST fill in the European Single Procurement Document.

Candidate's compliance to Core competence (MR 3)	4.3	Annex F	List of project reference(s) compliant to core competence MR3	Annex F	☐
Candidate's ability to provide sales and/or support services in the Netherlands within a limited amount of time (MR 4)	4.3	Annex G	Brief description about the presence of (a) sales and/or support office(s) of the Candidate within Europe (i.e. the European Economic Area including Switzerland and the UK)	Annex G	☐
Candidate's showcase reference to demonstrate its experience with supercomputer design, implementation and support (SC 1)	4.4	Annex H	Customer showcase reference in the field of transport and automation features	Annex H	☐
Candidate's current supercomputer listings in TOP500 (SC 2)	4.4	Annex I	List of current supercomputer listings by Candidate	Annex I	☐

Annex B. Proof of Consortium (if applicable)

Candidate MUST fill in this form when it submits its Qualification Submission as a Consortium.

The Consortium (Candidate) MUST describe how co-operation will be organised in order to achieve the expected results (i.e. what each Participant's role will be):

< please elaborate here >

The Consortium (Candidate) MUST describe which Participant will be assigned to act on behalf of the Consortium and to carry out all the contacts with SURFsara:

< please elaborate here >

The joint submission MUST be signed by all Participants. Alternatively, Participants may issue a power of attorney to another Participant. In that case the relevant declaration MUST be attached to the Qualification Submission.

< please provide the names and signatures of legal representatives of Participants here >



Please note the following:

- In case of a Consortium, all Participants must also fill in the European Single Procurement Document in Annex D.

The completed form forms an integral part of your Qualification Submission. This form has been added to this Qualification Document as file: 'Annex_B_Proof_of_Consortium'.

Annex C. Proof of subcontracting (if applicable)

Candidate MUST fill in this form when it submits its Qualification Submission with (a) subcontractor(s) on which it relies to fulfil one or more of the suitability requirements and/or selection requirements.

The Candidate MUST describe the roles, activities and responsibilities of subcontractor(s):
< please elaborate here >
A signed letter of intent by each subcontractor stating its intention to collaborate with the Tenderer MUST be included:
< please indicate here which letter(s) of intent have been included to your Qualification Submission >



Please note the following:

- In case of subcontracting, all Participants must also fill in the European Single Procurement Document in Annex D.

The completed form forms an integral part of your Qualification Submission. This form has been added to this Qualification Document as file: 'Annex_C_Proof_of_Subcontracting'.

Annex D. European Single Procurement Document (MR 1)

This document has been added to the Qualification Submission as a separate (xml) file in TenderNed. The completed form forms an integral part of your Qualification Submission.



Please note the following:

- In case of a Consortium and/or Subcontracting, all Participants and/or Subcontractors MUST fill in the European Single Procurement Document
- In part IV of the European Single Procurement Document the term 'Selection criteria' must be read as 'Suitability requirements' so as to be in line with the terminology used in the Qualification Submission document.

Annex E. Technical and professional ability – core competence (MR 2)

Candidate must explicitly list which project references are submitted as proof for the requested core competence MR2. This is a free format form. For example the table below can be used.

Rank	Of List	Customer	Short description

This form has been added to this Qualification Document as file:

‘Annex_E Compliance to Core competence (MR2)’

Annex F. Technical and professional ability – core competence (MR 3)

Candidate must explicitly list which project reference is submitted as proof for the requested core competence MR3. This is a free format form. The table below is a suggestion.

Rank	Of list	Customer	Short description
			For example, site location and system description

This form has been added to this Qualification Document as file:

‘Annex_F Compliance to Core competence (MR3)’

Annex G. Presence of support office in Europe (MR 4)

This free format form must be used by Candidate to provide a brief description about the presence of a support office of the Candidate within Europe (i.e. European Economic Area including Switzerland and the UK) in order to demonstrate Candidate's ability to provide support services in the Netherlands within a limited amount of time. The completed form forms an integral part of your Qualification Submission.

This form has been added to this Qualification Document as file:

'Annex_G_Presence_of_support_office_Europe_MR_4'

Annex H. Showcase reference

In relation to Candidate's technical and professional capacity, Candidate is asked to provide a customer showcase reference which demonstrates Candidate's experience with the design and implementation and support services of a state-of-the-art supercomputer solution.

Free format.

However, clearly addressing the following aspects:

- Contract and delivery dates;
- Architecture;
- Computing capabilities;
- Size and design of data storage;
- Energy efficiency;
- (Water)cooling efficiency;
- Scalability and extensibility over its lifetime;
- Collaboration and/or research;
- Support and maintenance.

Please use concise wording in 3 pages or less.

If more pages are submitted than the specified maximum, those extra pages will not be assessed.

Examples and clarifications such as plans, drawings, photos and figures do not count in the maximum number of pages.

This form has been added to this Qualification Document as file:

'Annex_H_Showcase_reference_SC_1'.



Please note the following:

- It MUST explicitly be indicated which part(y)(ies) fulfil(s) the specifications of this Selection Criterion. Thereby, Candidate may also rely on third parties to fulfil the Selection Criterion, but MUST in such case formally join forces as a Consortium and/or through subcontracting (please refer to section 5.2).

Annex H. Supercomputer listings in TOP500

This format is to be used by Candidate to provide an overview of all completed projects for the delivery and implementation of supercomputers which are currently (November 2019 listing) listed in the first 100 of the TOP500 (www.top500.org). These projects must have been delivered and implemented by Candidate.

The Candidate with the most rankings in the current TOP500 listing will receive rank number 1. Please refer to the ranking procedure in section 4.5 for more explanation.

Rank	Of List	Customer	Short description
	Nov 2019		
	Nov 2019		
	Nov 2019		
	Nov 2019		
	Nov 2019		
	Nov 2019		

This form has been added to this Qualification Document as file:

‘Annex_I_Supercomputer_listings_SC_2’.