

**Request For Proposals
For 10/100 Gigabit Ethernet Network Hardware**

This RFP solicits responses from qualified vendors for 100 Gigabit Ethernet network equipment in support of CENIC's CalREN networks.

Responses must be received via email to 100GE-RFP@cenic.org by

July 27, 2017, 5:00 PM Pacific Time

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1. Introduction and Solicitation Requirements.

1.1. Introduction

CENIC is charged with designing, provisioning, and operating robust, high capacity, next generation Internet communications services through a cohesive infrastructure for its associates. CENIC represents the common interests of its associates, who are drawn from California's education and research communities, and is highly accountable to the institutions it serves in order to fulfill the trust that has been placed with it. For more information about CENIC, see <http://www.cenic.org>.

CENIC operates connections to its associate sites, both via managed telecommunications services and via dark fiber. These connections vary in speed from 1Gbps to 100Gbps. CENIC manages these connections from its backbone to the edge of the associate site, terminating in a customer premise device (CPE), typically a router or switch, located at the associate site. This RFP seeks pricing for 100 Gigabit Ethernet CPE

Although this RFP seeks pricing for specific equipment configurations, CENIC wishes to establish a long-term relationship with whichever vendor(s) may be awarded this RFP. To this end, vendors are strongly encouraged to propose more general pricing, such as discounts across their entire product line, to facilitate future purchases of equipment other than that specified.

1.1.1. Contract Term and Specifications

It is anticipated that CENIC will enter into a minimum five (5) year agreement for equipment purchase and equipment maintenance which shall be payable annually, subject to satisfactory performance, with options to renew for additional years.

1.1.2. Questions

Questions concerning this RFP may be sent to 100GE-RFP@cenic.org. Questions, with the identity of the vendor redacted, and answers will be posted at <http://www.cenic.org/100gerfp>. Please allow two business days for response. Oral statements made by CENIC employees, consultants or others concerning the meaning or intent of the contents of this RFP are unauthorized and will not be considered binding.

1.1.3. Terminology

Throughout this document, several words or phrases are used to signify the requirements for various features or functions. When capitalized, the words are defined as follows:

MUST, REQUIRED, or SHALL describes a feature or function that is an absolute requirement.

MUST NOT or SHALL NOT describes a feature or function that is an absolute prohibition.

SHOULD describes a feature or function that is strongly desirable but not absolutely required. Vendors proposing a solution that does not meet a “SHOULD” requirement MUST include a description of the reasoning for not proposing a solution meeting the requirement, and MAY include information as to any future “roadmap” plans for meeting the requirement.

SHOULD NOT describes a feature or function that is strongly undesirable but not absolutely prohibited. Vendors proposing a solution that includes a “SHOULD NOT” capability MUST include a description of the reasoning for not proposing a solution without the undesired function, and MAY include information as to any future “roadmap” plans for removing the undesired function.

MAY or OPTIONAL describes a feature or function that may or may not be included. Vendors MUST include information about whether any feature or function labeled “MAY” or “OPTIONAL” is or is not included in the proposed solution.

1.2. Solicitation Requirements

1.2.1. RFP Process

The Vendor will submit a proposal based on the instructions and requirements contained in this RFP. After proposals are received, CENIC may, at its option and at a time of its choosing, enter into a round of confidential discussions with any or all of the responding Vendors. The purpose of these discussions would be to further clarify and substantiate the proposals. At the conclusion of the confidential discussion process, CENIC may issue an addendum to this RFP reflecting any necessary revisions as a result of the discussions. CENIC may require all Vendors to submit replacement proposals based on the addendum. CENIC may, at its sole option, not issue any order as a result of this RFP process.

All requirements and questions in the RFP MUST be addressed and all requested data MUST be supplied for the equipment or services being proposed. CENIC reserves the right to request additional information including clarifications of services or costs as submitted which, in CENIC’s opinion, is necessary to assure that all proposals are as complete as possible in addressing the breadth and scope of requirements of this RFP. Such additional information may be used as supplemental information to the Vendor’s response to this RFP.

1.2.2. Basis for Award.

The award of contract will be made to the Vendor or Vendors whose proposal is considered the most advantageous to CENIC considering program objectives, mitigation of risk, technical/cost relationships and other evaluation factors as identified herein.

CENIC may award to multiple vendors, or not at all, at its discretion.

1.2.3 Errors and Omissions Regarding the RFP.

If, prior to the date fixed for submission of proposal, a Vendor discovers any ambiguity, conflict, discrepancy, omission or other error in the RFP or any of its exhibits/appendices, the Vendor shall immediately notify CENIC of such error in writing and request modification or clarification of the document. Modifications will be made by addenda. Without divulging the source of the request, clarifications will be given by written notice to all parties who have been furnished an RFP for proposal purposes. If a Vendor fails to notify CENIC prior to the date fixed for submission of proposals of an error in the RFP known to the Vendor, or of an error that reasonably should have been known to the Vendor, the Vendor shall submit a proposal at its own risk, and if the Vendor is awarded the Agreement, the Vendor shall not be entitled to additional compensation or time by reason of the error or its later correction.

1.2.4. Addenda to the RFP.

CENIC may modify this RFP, its scope, any of its key action dates, or any of its attachments, prior to the date fixed for submission of proposals by issuance of an addenda to all parties who have been furnished the RFP for proposal purposes. Addenda will be numbered consecutively as a suffix to the RFP reference number. It is the responsibility of the Vendor to provide copies of addenda to its partners and/or sub-contractors, as necessary.

1.2.5. Submission of the RFP.

The Vendor will submit a proposal based on the instructions and requirements contained in this RFP. A proposal may be rejected if conditional or incomplete, or if it contains any alterations or other irregularities of any kind, and may be rejected if any such unresolved defect or irregularity could have materially affected the quality of the proposal. Proposals that contain false or misleading statements or provide references that do not support an attribute or condition claimed by the Vendor may be rejected. If, in the opinion of CENIC, such information was intended to mislead CENIC in its evaluation of the proposal, and the attribute, condition, or capability is a requirement of this RFP, the proposal will be rejected. Statements made by a Vendor shall also be without ambiguity and with adequate elaboration where necessary for clear understanding.

Vendors must respond to all sections of this RFP for their proposal to be considered complete.

1.2.6. Submission of Proposals.

Proposals must be received in electronic format via email to 100GE-RFP@cenic.org no later than Thursday, July 27 at 5:00 Pacific Time. The Vendor is responsible for ensuring their proposal was received by CENIC on time. Delays due to internal server errors or email issues at the Vendor side will be the responsibility of the Vendor. The proposal must be completed and delivered in sufficient time to avoid disqualification for lateness due to difficulties in delivery. LATE PROPOSALS WILL NOT BE ACCEPTED. Upon request by one or more bidders, CENIC may, at its sole discretion, extend the due date.

1.2.7. Vendors' Costs

Costs for developing proposals are entirely the responsibility of the Vendor and shall not be chargeable to CENIC.

1.2.8. Rejection of Proposals

CENIC may reject any or all proposals and may waive any immaterial deviation in a proposal. CENIC's waiver of an immaterial defect shall in no way modify the RFP documents or excuse the Vendor from full compliance with the specifications if the Vendor is awarded the Agreement. Proposals that include terms and conditions other than CENIC's terms and conditions may be rejected as being non-responsive. CENIC may make such investigations as deemed necessary to determine the ability of the Vendor to perform the work, and the Vendor shall furnish to CENIC all such information and data for this purpose as requested by CENIC. CENIC reserves the right to reject any proposal if the evidence submitted by, or investigation of, such Vendor fails to satisfy CENIC that such Vendor is properly qualified to carry out the obligations of the proposal and to deliver any goods or services requested herein.

1.2.9. Cancellation of Solicitation

This solicitation does not obligate CENIC to enter into an Agreement. CENIC retains the right to cancel this RFP at any time. No obligation, either expressed or implied, exists on the part of CENIC to make an award or to pay any cost incurred in the preparation or submission of a proposal.

1.2.10. Proposals Become the Property of CENIC

All Proposals become the property of CENIC. CENIC reserves the right to make use of any information or ideas contained in the proposals.

1.2.11. Disposition of Proposals

All materials, ideas, and formats submitted in response to this RFP will become the property of CENIC on receipt and may be returned only at CENIC's option and at the

Vendor's expense. One copy shall be retained for CENIC's files.

1.2.13. Confidential Material

CENIC values openness with and transparency to its constituent community. In general, materials contained in Vendors' proposals may be shared with members of that community. The Vendor must notify CENIC in advance of specific proprietary or confidential material contained in the proposal and provide justification for not making such material public. CENIC will endeavor to honor such requests.

1.2.14. Disputes/Protests

CENIC's decision with regard to any award or lack of award stemming from this RFP is final. CENIC will not entertain protests or disputes.

1.2.15. Award of Agreement

CENIC reserves the right to reject any and all proposals and to award one or more Agreements. Award, if any, will be to the Vendor(s) whose proposal is considered the most advantageous to CENIC considering program objectives, mitigation of risk, technical/cost relationship, CENIC's assessment of the Vendor's (s') ability to perform, and other evaluation factors as identified herein and that best complies with all of the requirements of the RFP documents and any addenda. A notice of "Selection of Successful Vendor(s)" will be emailed to each proposing Vendor.

Subsequent to the notice of "Selection of Successful Vendor(s)", CENIC and the Vendor(s) will engage in a good faith negotiation of an Agreement that will govern the provision of the services to be provided to CENIC by the chosen Vendor(s).

Should negotiations be unsuccessful or if it is determined in CENIC's sole opinion that the selected Vendor is unable to perform or is unwilling to honor their proposal, CENIC reserves the right to terminate negotiations and select another Vendor.

SECTION 2: SCHEDULE OF EVENTS

- 06/22/17: RFP Issued
- 07/27/17: Responses Due
- August 2017: Estimated date of Award

SECTION 3: ADMINISTRATIVE REQUIREMENTS

In addition to meeting all other requirements of this RFP, potential Vendors must meet all the administrative requirements contained in this section. This section is intended to address requirements for demonstrating Vendor's general administrative and management capabilities. CENIC will consider responses to this section as part of the overall evaluation.

3.1 Cover Letter

Responding Vendors shall provide a cover letter that includes a brief statement of intent to perform the services, qualifications for selection and signature by an authorized officer of the firm who has legal authority in such transactions. Unsigned proposals shall be rejected. Include Vendor's name, address, telephone and fax numbers and the name(s) of authorized representative(s).

In addition, Vendor's cover letter shall expressly state that, should the Vendor's proposal be accepted, the Vendor agrees to enter into an Agreement under the terms and conditions as prescribed in this RFP.

3.2. Financial Statements

Vendor shall submit audited financial statements for the two most recent year ends, a Form 10K for the most recent year end (if available), and the most recent annual reports. The financial statement shall demonstrate that the Vendor currently has the necessary financial strength and capacity to perform as they propose and as is required in this RFP. This information should be provided for each corporation or other independent business entity that is a contractor or Sub-contractor on any Vendor team. CENIC shall maintain the confidentiality of financial statements for non-publicly held businesses, if requested to do so at the time of submission.

3.3. Bankruptcy and Insolvency

Vendor must provide a statement certifying that no member of the Vendor team (Vendor, Vendor subsidiaries or sub-vendor) has declared bankruptcy or filed for protection under any of the bankruptcy or insolvency statutes within the past five (5) years.

3.4. Qualifications and Experience

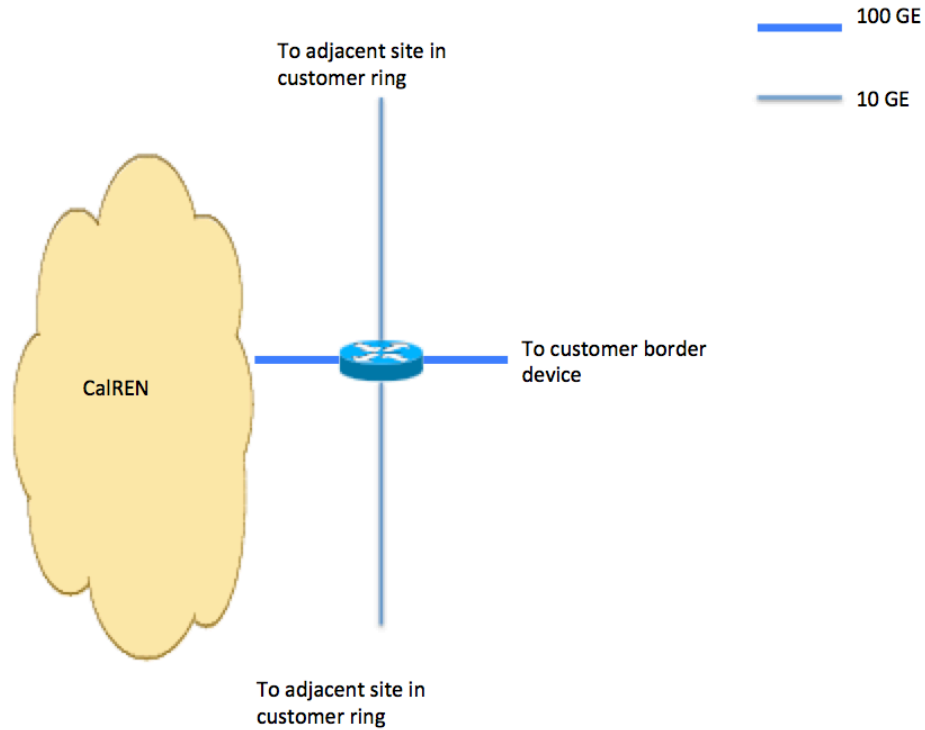
Prior to award of the contract, CENIC must be assured that the Vendor selected has all of the resources required to successfully perform under the contract. This includes, but is not limited to: adequate personnel with the skills required; financial resources sufficient to complete performance under the Agreement; and, experience in similar endeavors. If, during the evaluation process, CENIC is unable to assure itself of the Vendor's ability to perform under the Agreement, if awarded, CENIC has the option of requesting any information that CENIC deems necessary to validate the Vendor's competency in meeting contractual responsibilities.

3.5. Lawsuits

The Vendor shall provide a statement informing CENIC of any current or pending lawsuits that may impact this project.

SECTION 4: TECHNICAL SPECIFICATIONS AND REQUIREMENTS.

CENIC seeks to purchase, over the course of the contract term, approximately 25 switch/routers to serve as customer premise equipment (CPE) for 100 Gigabit Ethernet-connected customers. The typical use case for the equipment is shown in the diagram below:



4.1. Physical Characteristics

- 4.1.1. The equipment **MUST NOT** exceed 11 rack units in height.
- 4.1.2. The equipment **SHOULD NOT** exceed 28 inches in depth.
- 4.1.3. The equipment **MUST** fit into a standard 19" rack.
- 4.1.4. The equipment **MUST** weigh no more than 300 pounds fully-loaded.
- 4.1.5. The equipment **MAY** be capable of being center-mounted.

4.2. Airflow

- 4.2.1. The equipment **MAY** support front-to-back airflow.
- 4.2.2. The equipment **MAY** provide for redundant fans.

4.3. Power

- 4.3.1. The equipment **SHOULD** support DC power.
- 4.3.2. The equipment **MUST** support redundant power supplies.
- 4.3.3. The equipment **MUST** consume no more than 4,000 Watts (AC) when fully loaded, including any startup spikes.

4.4. Slots and Ports

- 4.4.1. The equipment, if modular, **MUST** provide at least two usable slots for 10GE and/or 100GE ports (i.e., excluding slots used for management or other non-port cards). This requirement does not apply to fixed (non-modular) platforms.
- 4.4.2. The equipment **MUST** provide at least 4 100GE ports.
- 4.4.3. The equipment **SHOULD** provide at least 8 10GE ports.
- 4.4.4. For 10GE ports, the equipment **MUST** support both LR and SR pluggable optics.
- 4.4.5. For 10GE ports, the equipment **MAY** support ZR and ER optics.
- 4.4.6. For 100GE ports, the equipment **MUST** support LR4 optics.
- 4.4.7. For 100GE ports, the equipment **MUST** support either SR4 or SR10 optics. The Vendor **MUST** specify in the response to this requirement which of these is supported.

4.4.8. For 100GE ports, the equipment **MUST** support QSFP28 optics.

4.4.9. For 100GE ports, the equipment **MAY** support ER4 (40km) optics.

4.5. Memory

4.5.1. The equipment **MUST** provide at least 8GB of memory.

4.5.2. The equipment **SHOULD** be expandable to provide at least 16GB of memory.

4.5.4. The equipment **SHOULD** support at least 1,000,000 IPv4 routes in TCAM simultaneously with at least 200,000 IPv6 routes.

4.5.6. The equipment **SHOULD** support access control lists with at least 4,000 entries.

4.6. Quality of Service

4.6.1. The equipment **SHOULD** support modified deficit round robin (MDRR) queueing.

4.6.2. The equipment **SHOULD** support class-based weighted fair queueing (CBWFQ).

4.6.3. The equipment **MUST** support at least one of the two queueing strategies listed in sections 4.6.1 and 4.6.2.

4.6.4. The equipment **MUST** support at least four queues, with one priority queue.

4.6.5. The equipment **MUST** support traffic shaping.

4.6.6. The equipment **MUST** support traffic policing.

4.7. Throughput

4.7.1. The equipment **MUST** support at least 200Gbps bidirectionally across the backplane.

4.7.2. The equipment **SHOULD** support at least 43,000,000 packets per second bidirectionally across the backplane.

4.8. Management

4.8.1. The equipment **MUST** provide a standard RS-232 serial port for management.

4.8.2. The equipment **SHOULD** provide for redundant management processors.

4.9. Maintenance

4.9.1. The Vendor **MUST** provide pricing for next-business-day maintenance for the equipment proposed.

4.10 Other Services

4.10.1. The equipment **MAY** support MPLS-TE/RSVP with Ethernet pseudowires.