University of California Lawrence Livermore National Laboratory

Multi-Programmatic and Institutional Computing Capacity Resource

Proposal Preparation Instructions

Thunder Cluster

B532746

Version 2
September 24, 2003

TABLE OF CONTENTS

1 GENERAL PROPOSAL INFORMATION 3
1.1 Proposal Format 3
2 TECHNICAL PROPOSAL (VOLUME I) 3
2.1 Section 1. Overall Approach and Objectives 4
2.2 Section 2. System Architecture and Overview 4
2.3 Section 3. Cluster Description 4
2.4 Section 4. Reliability, Availability, Serviceability and Maintenance 4
2.5 Section 5. Facilities Information 5
2.6 Section 6. Project Management 5
2.6.1 Open Source Collaboration 5
2.6.2 Project Manager 5
2.6.3 Project Milestones 6
3 BUSINESS PROPOSALS (VOLUME II) 6
3.1 Section 1. Company Qualifications 6
3.2 Section 2. Linux Product Roadmap 6
3.3 Section 3. Proposed Open Source Development Partnership 7
4 PRICE PROPOSAL (VOLUME III) 7
4.1 Section 1. System Prices 7
4.2 Section 2. Lower-Tier Subcontractor Price Information 7
5 OTHER DOCUMENTS (VOLUME IV) 7
5.1 Section 1. Software Branding and Licensing 7
5.2 Section 2. System Warranty Information 8

1 GENERAL PROPOSAL INFORMATION

1.1 Proposal Format

All proposal copies shall be presented using 8 1/2 by 11-inch paper in loose-leaf binders. The page limit for the Technical Proposal (Volume I) is 50 pages and for the Business Proposal (Volume II) is 20 pages, and is defined as consecutively numbered pages. There is no page limit for the Price Proposal (Volume III) and Other Documents (Volume IV) portions of the proposals. At least 12-point font shall be used and the paper copies must be printed on one side only.

Table 1
Proposal Format

VOLUME—SECTION NUMBER
Volume I Technical Proposal *(50 page limit total)* Section 1. Overall Approach and Objectives Section 2. System Architecture and Overview Section 3. Cluster Description Section 4. Reliability, Availability, Serviceability and Maintenance Section 5. Facilities Information Section 6. Project Management
Volume II Business Proposal *(20 page limit total)* Section 1. Company Qualifications Section 2. Linux Product Roadmap Section 3. Proposed Open Source Development Partnership
Volume III Price Proposal (*no page limit*) Section 1. System Prices Section 2. Lower-Tier Subcontractor Price Information
Volume IV Other Documents *(no page limit)* Section 1. Software Branding and Licenses, if applicable Section 2. System Warranty Information Section 3. Representations and Certifications Form

2 TECHNICAL PROPOSAL (VOLUME I)

In the Technical Proposal, the Offeror shall describe the systems proposed. This shall be written in the form of an integrated narrative **and shall include a point-by-point response to the technical requirements contained in the Statement of Work**. In the interest reducing both the RFP response time and the time to build Thunder, the University has specified (non-mandatory) specific solutions to many requirements. If these solutions are proposed, then the response can be much simplified. This narrative shall include a description of each of the proposed system. The Technical Proposal shall be divided into the following tabbed sections:

2.1 Section 1. Overall Approach and Objectives

Discuss the Offeror's approach to responding to this RFP and meeting the M&IC programmatic objectives. Discuss the overall software and hardware build strategy for the cluster. Give a summary of what will be delivered when.

2.2 Section 2. System Architecture and Overview

The system architecture and overview section of the technical proposal shall contain the following information:

- Architecture – An executive summary that provides an architecture of the proposed solution. The architecture should cover three areas: 1) overall system architecture; 2) architecture of each scalable unit; 3) Architectural description of each node type proposed. Each architectural description will delineate major functional and performance capabilities.
- Deliverables – A list of hardware and software items to be delivered and the delivery dates, and quantities. This information shall be provided for items one level below the subsystem level.
- Definitions and Acronyms – A definition of terms, acronyms, and abbreviations used in the document.

2.3 Section 3. Cluster Description

This section shall contain a detailed description of the proposed cluster. This includes the a detailed response to each requirement in section 3 of the statement of work. The response shall include the requirement number and text with Offeror's response below. If alternative approaches are chosen rather than those given as examples, then the alternative approach should be outlined in the same fashion as the example requirements.

2.4 Section 4. Reliability, Availability, Serviceability and Maintenance

This section shall contain a detailed description all facts relating to the reliability, availability and serviceability of the cluster. In particular, provide the Mean Time Between Failures (MTBF) calculation. This calculation shall be performed using a recognized standard. Examples of such standards are Military Standard (Mil Std) 756, Reliability Modeling and Prediction, which can be found in Military Handbook 217F, and the Sum of Parts Method outlined in Bellcore Technical Reference Manual 332. In the absence of relevant technical information in the proposal, the University is forced to make pessimistic reliability, availability and serviceability assumptions in evaluating the proposal. This section shall describe in detail the proposed hardware and software maintenance strategy throughout the life of the subcontract. Include the level of service you intend to provide at various points during the subcontract period (i.e., system build, system installation, acceptance testing, post acceptance, etc.). For hardware maintenance, specify the length of time (from initial purchase of parts for build) that replacement parts will be IDENTICAL (e.g., same speed, same motherboards, etc.). In addition, delineate replacement parts policy once bid commodity components reach end of life until the end of the required three years of hardware maintenance.

Specific hardware maintenance roles and responsibilities for LLNL, Offeror, and Quadrics should be delineated. Specific elements of the spare parts cache and on-site hot spares shall be itemized. Failed hardware return mechanism and parts cache refresh policy shall be discussed. Software maintenance procedures shall be delineated for provided software components. For instance, describe how software patches will be provided to LLNL and how they will be tested.

2.5 Section 5. Facilities Information

Because of the essential requirement for rapid deployment of Thunder, the University has provided specific (non-mandatory) solutions to most of the RFP requirements. In addition, the University has already determined the Thunder floor plans, electrical and cooling requirements for siting Thunder. Facilities modifications to B451 are already underway based on these system parameters. If the Offeror proposes the solutions specified, then the response can be simplified. However, if the Thunder solution is different from the specific solutions outlined by the University in the statement of work, then the Offeror must respond with a detailed proposed layout.

In addition, if the facilities requirements for the computer floor that Thunder will be built on are significantly different from the University facilities and hence dictate a different Thunder layout, then the Offeror will also provide a detailed proposed layout. Be advised that the Quadrics QsNet Elan4 cables represent a long lead-time item and are already being cut to the lengths for the University proposed layout. Any changes to the layout would have to be compatible with these cable lengths. Contact John Taylor (johnt@quadrics.com) at Quadrics for detailed cable length information.

See Section 5 of the Statement of Work. The floor plan will include a diagram of asset placement, as well as floor-loading information, under-floor clearance requirements, and placement and type of required electrical outlets.

Provide the estimated total amount of power in kW (kilowatts) required for the cluster proposed, including any subsystems (e.g., I/O cabinets, disks, cabling, external networking, etc.). The plan will also include the estimated total amount of cooling in BTU (British Thermal Units) or Tons AC required for the cluster proposed. List any other facilities requirements.

2.6 Section 6. Project Management

The following Project Management information shall be provided as part of the Offeror's proposal:

2.6.1 Open Source Collaboration

This section shall discuss how the partnership will collaborate, over the term of the subcontract and beyond, on open source development. Of particular interest is how the open source development efforts feed into the delivery of cluster and their support and enhancement over the term of the subcontract.

2.6.2 Project Manager

Name a project manager who will provide supervision within the corporation for the building, testing, delivery and acceptance of the proposed cluster. Provide the resume of

this individual and a description of the roles and responsibilities in the format shown in Appendix A. Also indicate the level of authority this individual will carry within the corporation for the management of this activity.

2.6.3 Project Milestones

Provide a draft Gantt chart and work-breakdown structure (WBS), including milestones, for the project in the form of a Microsoft Project 2000 data file with the proposal submission. Indicate which items are being subcontracted to third parties and which items are on the critical path. Also, include a draft pre-ship test plan and a draft acceptance test plan in Microsoft Word 2000 format.

3 BUSINESS PROPOSALS (VOLUME II)

3.1 Section 1. Company Qualifications

Provide the following background information on those contracts during the past two years that the Offeror considers the most comparable to the requirements of this RFP in terms of providing high-end computing systems and working with high-end customers and partners to advance the high-end computing state-of-the-art: contract number; contract type; contract value; contract effective date and term; place of performance; client contacts (include the name and phone number of contractual contact and the name and phone number of technical contact); similarities to University requirements.

To assist the University in assessing the financial capability of the Offeror, provide any or all of the following:

a. Audited balance sheets and profit and loss statements for the Offeror's company for the last six (6) completed financial quarters, including interim statements for the current quarter. Also provide copies of your Form 10-K filed with the Securities and Exchange Commission for the past two (2) fiscal years, plus any 10-Q Forms filed since the last Form 10-K.
b. Furnish affirmative assurance, such as endorsements from financial institutions, that your company has sufficient funds necessary to perform the work.
c. State what percentage of your performing organization's estimated total business during the period of performance this proposed subcontract will represent.
d. State the distribution of your last complete fiscal year's sales volume among commercial business, Government prime contracts, and subcontracts under Government prime contracts.
e. Provide a current Dun and Bradstreet Payment Analysis Report (PAR).

Please provide any other relevant and useful information about the financial health of the corporation that will assist the University in assessing the financial capability of the Offeror.

3.2 Section 2. Linux Product Roadmap

Describe the corporation's Linux product roadmap for the next two years. Include hardware and software offerings. Provide information that will give an indication of the depth and scope of the product roadmap as well as the products targeted specifically at high-performance Linux clustering. Indicate the open source partnerships the corporation is involved in and how the results of these effort factor into future products.

3.3 Section 3. Proposed Open Source Development Partnership

The Offeror may provide information on the capabilities of the corporation to engage in an open source development partnership and meet the goals set out in Statement of Work section 6.1. This information should include corporation's qualifications as a cluster provider; corporation's qualifications as an open source development organization; cluster product roadmap and comparison to the overall strategy; the willingness of the corporation to participate in the open source development, with other partners, of key missing High Performance Technical Computing (HPTC) cluster technology components such as scalable parallel file systems and cluster resource scheduling. If the Offeror has technology, such as a scalable parallel file system or cluster management tools or cluster resource scheduling that could be contributed to the overall software effort, please indicate that as well.

4 PRICE PROPOSAL (VOLUME III)

4.1 Section 1. System Prices

The attached Price Schedule 1 (contained in the file "ThunderPriceScheduleV1.xls") shall be completed for the cluster proposed. Individual prices for each item listed are mandatory requirements. Not providing this information will render the proposal non-responsive and it will receive no further consideration.

Offerors shall provide firm fixed prices. Maintenance prices shall be based on next business day 8:00AM-5:00PM, Pacific Time Zone, service for all systems proposed for the duration of the contract.

An entry must be made for each line item. If the price of a line item is being offered at "No Charge" to the University insert "NC" for that entry. If a line item cannot be separately priced, insert "NSP" for that entry. For that line item, the Offeror must also insert the entry "Note __" directing the University to the "Note" that provides a narrative explanation for all "NSP" entries, identifying which line item includes that price. All accompanying notes shall be included at the end of the price schedule.

4.2 Section 2. Lower-Tier Subcontractor Price Information

If the Offeror is proposing to use lower-tier subcontractors, price information for each Subcontractor shall be furnished in the same format and level of detail as prescribed for the Offeror.

5 OTHER DOCUMENTS (VOLUME IV)

5.1 Section 1. Software Branding and Licensing

Submit all branding or certification of software standards adherence required in section 2.

Submit licensing policies for all categories of software (compilers, libraries, application development tools, etc.) being provided under this Subcontract. Identify all third-party software. Include policies for cluster-wide right-to-use licenses for an unlimited number of users for all software delivered under this Subcontract. Include any required Software

License or Maintenance Agreement as well as any licensing requirements for source code. The following conditions must be incorporated in any resulting license agreement or maintenance agreement:

a. The governing laws of the state of California;
b. The right of assignment of any agreement to the Department of Energy/National Nuclear Security Administration (DOE/NNSA) for assignment to any succeeding prime contractor to the University. An Offeror's proposal may be considered non-compliant in the event the Offeror and the University cannot mutually agree to terms and conditions contained in any Software License or Maintenance Agreement.

5.2 Section 2. System Warranty Information

Provide warranty information for all Offeror-provided items as well as any third-party subcontracted items.

Appendix A

Resume Format

Name:

Proposed Title/Assignment on Contract:

Experience Summary: (A succinct summary of overall experience and capabilities including the name and phone number of the client that may be used for reference checking):

Current Assignment (Include description and from/to dates):

Current Client/Customer (Include current address and telephone number):

Education:

Technical Qualifications:

Description(s) of Experience relevant to Proposed Contract Assignment:

Provide Three Business Related References:

List Awards/Honors/Publications:

RESUMES MUST NOT EXCEED FOUR (4) PAGES IN LENGTH
References listed in the resumes may be contacted to verify relevant experience as part of the evaluation process.