

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U.S. Department of Energy

**Office of Science
Office of Advanced Scientific Computing Research
High-Performance Networks for Distributed
Petascale Science**

Funding Opportunity Number: DE-PS02-08ER08-27

Announcement Type: Initial

CFDA Number: 81.049

ISSUE DATE:	September 30, 2008
PREAPPLICATION DUE DATE:	Not Required
LETTER OF INTENT DUE DATE:	October 31, 2008, 5:00 p.m., Eastern Time (Required)
APPLICATION DUE DATE:	December 17, 2008, 8:00 p.m. Eastern Time

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit: Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

MICROSOFT VISTA AND OFFICE 2007 COMPATIBILITY: Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See www.grants.gov/www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the Department of Energy (DOE).

Application Receipt Notices: After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

Number 1 – Grants.gov Submission Receipt Number

Number 2 – Grants.gov Submission Validation Receipt for Application Number

Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 – DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

The technical contact/program manager for this program is:

Dr. Thomas D. Ndousse-Fetter

Next-Generation Networks for Science Program

Telephone: (301) 903- 9960, Fax: (301) 903-7774, E-mail: tndousse@er.doe.gov.

SUMMARY:

The Office of Advanced Scientific Computing Research (ASCR) of the Office of Science (SC), U.S. Department of Energy (DOE), hereby announces its interest in receiving grant applications for research and development projects in high-capacity and high-performance networks to support distributed petascale science. Awards for this solicitation will be made in FY2009, subject to the availability of funds.

SUPPLEMENTARY INFORMATION:

The emergence of distributed petascale science in DOE, characterized by supercomputers that perform quadrillions of mathematical operations per second; large science experiments that generate petabyte-scale data; and large-scale scientific collaborations that are of National and International scale, have generated the need for a new generation of networks with unprecedented capabilities. The core capabilities of these networks include: 1) the ability to deliver multi-gigabits/sec - terabits/sec throughputs to high-end science applications; 2) the capability to dynamically provision on-demand bandwidth and circuit services to a variety of science applications across federated networks; and 3) the ability to diagnose faults, and to measure, monitor, and predict end-to-end performance of federated networks.

This Notice solicits innovative basic and applied research to develop and deploy terabits network technologies in existing and new DOE network infrastructures to meet the short- and long-term needs of the emerging distributed petascale science. Prospective researchers should observe that:

- Proposed research activities should be relevant to DOE networking infrastructures by focusing on technologies that are directly applicable to the following networking infrastructures: 1) Energy Science Network (ESnet – <http://www.es.net>) core IP backbone network and the Science Data Network (SDN); 2) DOE laboratories LANs; and 3) end systems hosting DOE high-end applications. Applicants are strongly encouraged to contact the engineering teams of these facilities for information on using them to enhance, validate, or test concepts and technologies proposed in their applications.
- Collaborative applications involving multiple institutions, which may include: universities, laboratories, and/or private institutions, are encouraged but not required. Collaborative applications should be developed as a single unified and complete application. However, each participating institution is required to submit a formal copy of the same application. Subcontracting will not be allowed through the lead institution in a collaborative application. Additional information on preparing and submitting multi-institution applications can be obtained at: <http://www.sc.doe.gov/ascr/Research/NextGen.html>

- No funds will be provided to Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, under this Notice. Laboratories should respond to the **LAB 08-27 Announcement** posted at: <http://www.science.doe.gov/grants/grants.html>.
- Researchers may request a period of performance of up to a maximum of three (3) years, subject to the availability of funds.

Technical Areas

The emerging distributed petascale science environment in DOE will require a new generation of networks with unprecedented capabilities. Achieving such capabilities will require scaling existing network technologies and developing revolutionary new protocols, tools, and services that will make end-to-end terabit networks possible. In contrast to today's networks that use best-effort IP network concepts to provide conventional networking services, it is anticipated that the next-generation of terabit networks for science will use federated hybrid (packet and circuit-switched) networking concepts to support the diverse needs of DOE science applications. In addition, it is expected that alternatives or enhanced versions of protocols, such as TCP, UDP, and IP will be needed to achieve terabits/sec throughputs. Also, new provisioning techniques that offer on-demand switched circuit services will be needed to overcome the limitations of best-effort IP networks where guaranteed bandwidths and quality of services are critical. The ability to diagnose faults and monitor and predict network performance across federated networks will also be critical. This announcement focuses on innovative and revolutionary technologies that address these challenges, especially at the terabits/sec end-to-end performance level. Particular technical areas of interest include, but are not limited to, the following:

1. ***Terabit data transfer protocols, tools, and services.*** Advanced technologies capable of providing secure and rapid data transfers will be needed to support the distribution of petabyte-scale data generated by scientific experiments and petascale simulation. Such technologies must be easily deployable and deal effectively with the end-to-end issues of data transfers over very long distances, and securely provide terabit throughputs in a variety of scientific data transfer settings, including peer-to-peer and real-time data transfers. Other highly desirable features include: 1) dynamic reconfiguration capabilities to support different data transfer objectives such as batch, scheduled, streaming, and reservation data delivery; 2) automatic detection and use of appropriate and available transport protocols, such as (TCP-variants, UDP-variants, Fiber Channel, Infiniband, SCSI, etc.) in different data transfer scenarios; 4) data transfer utilities such as fault recovery, optional authentication services, real-time throughput monitoring, etc.; and 5) APIs to integrate data transfer protocols with host applications and workflows, including network control and management applications.
2. ***Composable transport protocols.*** The vast majority of today's network services revolve around TCP and UDP stacks. These two widely deployed stacks converge on the use of a single IP stack. While a single IP stack simplifies network usage, it makes it difficult to develop and deploy advanced capabilities needed to support distributed petascale science applications in terabits/sec networks. Transport protocols envisioned for next-generation

networks should preferably be component-based to enable different types of networking scenarios achieved by dynamically assembling protocol components that are optimized for different types of applications and layer 1-3 transport network technologies. The goal is to have composable transport protocols that can effectively deliver terabit throughput and can be dynamically reconfigured to take full advantage of today's rich variety of transport media (circuit-based DWDM, VLANs, SONET, guaranteed bandwidth, etc.). Other desired features for composable transport protocol frameworks include the following: 1) user-space and kernel-level instrumentation to collect real-time performance data; 2) modular design to facilitate composability; 3) selectable congestion control to be used only when needed; 4) variable packet lengths with corresponding error correction capabilities; and 5) the ability to handle real-time applications.

3. ***Advanced network provisioning technologies.*** Innovative techniques will be needed to enable secure dynamic multi-layer end-to-end circuit-based services across federated networks. Particular network provisioning technologies of current interest are those that will use out-of-band signaling and control plane technologies to implement on-demand, reservation, and scheduled services to offer coarse- and fine-grain federated switched services. Applicants interested in this topic are encouraged to focus on technologies that are directly applicable to DOE's ESnet and Science Data Networks (<http://www.es.net>). The current technical areas of interest include the following: 1) extensions of existing control plane technologies such as GMPLS, MPLS, etc., to accommodate advanced scheduling, reservation, and authentication; 2) techniques to secure federated control plane networks; 3) mathematical modeling of unified control plane technologies, path computations, and traffic engineering for multi-layer and multi-domain networks offering hybrid best-effort IP and switched circuit services; and 4) secure APIs to integrated control plane and signaling systems with user applications and network monitoring systems.
4. ***High-performance network interfaces.*** Providing secure access and coupling distributed high-end applications to next-generation networking for science will require robust distributed systems software. Specific areas of interest include, but are not limited to, the following: 1) network-storage system interfaces to enable petascale storage systems to take full advantage of terabit network capabilities; 2) network-application interfaces to facilitate the deployment and usage of network-enabled applications; 3) network-file system services for mapping data from networks onto storage systems; 4) host systems stack enhancements that hide network complexities from users.
5. ***Federated network management and monitoring.*** Advanced network instrumentation services and tools will be needed to efficiently and effectively measure and predict the performance of terabit networks. These include multi-layer, end-to-end network management tools and services such as end-to-end performance prediction, fault location and diagnosis, and dynamic circuit monitoring of heterogeneous multi-domain networks. Particular technical issues of critical importance in the area include, but are not limited to, the following: 1) robust techniques based on sound principles to collect, store, analyze, and correlate network monitoring data in multi-domain networks; 2) scalable

frameworks for coordinating different network monitoring policies and network measurement standards across multiple networks; 3) advanced tools and services for diagnosing faults and monitoring the performance of dynamic circuits across multiple domains; and 4) discovery services network measurement in peer networks.

More information on DOE's Next-Generation Networking for Science can found at this Website: <http://www.sc.doe.gov/ascr/Research/NextGen.html>.

Additional Information

As a mission-oriented agency, DOE conducts network research to support its mission objectives. As part of the application development, applicants are required to justify that their proposed research is relevant to DOE's science mission by including in the technical narrative of their application a plan to transfer the research results to DOE's network and computing infrastructure should they be successful. A network testbed facility operated by DOE's Energy Science Network (<http://www.es.net>) will be made available to assist researchers to develop and test prototypes resulting from successful network research projects funded under this announcement. Other arrangements to validate research prototypes not directly applicable to DOE's ESnet will be possible in National Laboratories and collaborating science facilities. Additional information on DOE networking requirement can be obtained in the following DOE networking workshop reports:

- a) Workshop on Advanced Networking for Distributed Petascale Science: R&D Challenges and Opportunities. April 8–9, 2008. [Report in PDF](#)
- b) Workshop on Science-Driven R&D Requirements for ESnet, April 23-24, 2007. [Report in PDF](#)

Collaboration

Applicants are encouraged to collaborate with researchers in other institutions, such as universities, industry, non-profit organizations, federal laboratories and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories, where appropriate. Additional information on collaboration is available in the Application Guide for the Office of Science Financial Assistance Program that is available via the Internet at: <http://www.sc.doe.gov/production/grants/Colab.html>.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding cooperative agreements under this Program Announcement.

B. ESTIMATED FUNDING.

Awards are expected to be at most \$500,000 per year for multi-institution applications and \$150,000 per year for single investigator applications. The funding period for all projects will be three years, subject to availability of funds. Grant applications funded under this announcement will be handled as cooperative agreements. It is anticipated that up to six multi-institution and ten single awards will be made for this announcement contingent on availability of appropriated funds in Fiscal Year 2009.

DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted.

C. MAXIMUM AND MINIMUM AWARD SIZE.

See B. Estimated Funding section above.

D. EXPECTED NUMBER OF AWARDS.

See B. Estimated Funding section above.

E. ANTICIPATED AWARD SIZE.

See B. Estimated Funding section above.

F. PERIOD OF PERFORMANCE.

See B. Estimated Funding section above.

G. TYPE OF APPLICATION.

DOE will accept new applications under this Announcement.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

All types of applicants are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS

N/A

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants", and then select "Download Application Package". Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package. NOTE: You will not be able to download the Application Package unless you have installed PureEdge Viewer (See: <http://www.grants.gov/DownloadViewer>).

B. LETTER OF INTENT AND PREAPPLICATION.

1. Letter of Intent.

A one-page Letter of Intent (LOI) is **REQUIRED** and must be received by **October 31, 2008, 5:00 p.m., Eastern Time**. The Letter of Intent should be submitted by e-mail as a PDF file attachment to: network_research@ascr.doe.gov. Please use "Letter of Intent for Announcement **DE-PS02-08ER08-27**" in the subject line of the email.

The purpose of the Letter of Intent (LOI) is to facilitate the planning of the peer review process and the selection of reviewers, including identifying any potential conflicts of interest. The one-page LOI must include the following information: the announcement number **DE-PS02-08ER08-27**; name, institutional affiliation, and contact information of the Principal Investigator (PI); names and institutional affiliations of other PIs and senior personnel; projected funding request (if possible); title of the proposed effort; and an abstract of the proposed research. For collaborations involving multiple institutions, a single Letter of Intent should be submitted by the PI of the lead institution. An example of the format for the one-page Letter of Intent can be viewed at: <http://www.science.doe.gov/ascr/Research/NextGen/solicitation.html>.

A response to the Letters of Intent encouraging or discouraging formal applications will be communicated to the applicants by **November 14, 2008**. **Formal applications will be accepted only from those encouraged to submit. No other formal applications will be considered.**

2. Preapplication.

Preapplications are not required.

C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

1. SF 424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the Applicant and Recipient Page at: http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 2 pages when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point.

Project Narrative (Field 7 on the form)

The project narrative for an application must not exceed 20 pages of technical information, including charts, graphs, maps, etc., and should be printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information.

The Abstract, Narrative, and Budget Justification should each be one PDF file attachment. The PDF file may also include a few selected publications in an Appendix as background information. In addition, please limit biographical and publication information for the principal investigator and key personnel to no more than two pages each. Letters from collaborators should also be included, if applicable. See below for detailed requirements regarding the Project Description, Biographical Sketch and Collaborators, etc. To attach a Project Narrative, click “Add Attachment.”

The first page of your narrative must include the following information (this page will not count in the project narrative page limitation):

**Applicant/Institution:
Street Address/City/State/Zip:
Principal Investigator:
Postal Address:
Telephone Number:
Email:
Funding Opportunity Announcement Number:
DOE/Office of Science Program Office:
DOE/Office of Science Program Office Technical Contact:
DOE Grant Number (if Renewal or Supplemental Application):**

Is this a Collaboration? If yes, please list ALL Collaborating Institutions/Pis* and indicate which ones will also be submitting applications. Also indicate the PI who will be the point of contact and coordinator for the combined research activity.

** Note that collaborating grant applications must be submitted separately.*

Project Objectives.

This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Project Timetable:

This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

Project Performance Site

Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.

Biographical Sketch Appendix

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. **Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file.** The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training. Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications. Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities. List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support Appendix.

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Provide the Current and Pending Support as an appendix to your project narrative. Do not attach a separate file. The Current and Pending Support Appendix will not count in the project narrative page limitation. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the “Attach Current and Pending Support” field in each profile.

Identification of Potential Conflicts of Interest/Bias in Selection of Reviewers Appendix.

Provide the following information in this appendix and append to your project narrative. Do not attach a separate file. (This appendix will not count in the project narrative page limitation):

Collaborators and Co-editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state “None.”

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last 5 years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates during the past 5 years.

Bibliography & References Cited Appendix

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Facilities & Other Resources Appendix This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Equipment Appendix

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Other Attachment Appendix

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, please provide this information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Do not attach files for fields 8, 9, 10, and 11, instead follow the above instructions to include the information as appendices to the project narrative file.

3. RESEARCH AND RELATED BUDGET.

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the

applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in Field K.** The file automatically carries over to each budget year.

4. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	Attach to
SF 424 (R&R)	PureEdge Form	N/A
RESEARCH AND RELATED Other Project Information	PureEdge Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
RESEARCH & RELATED BUDGET	PureEdge Form	N/A
Budget Justification	PDF	Field K

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES.

1. Preapplication Due Date.

Preapplications are not required.

2. Letter of Intent Due Date.

A one-page Letter of Intent (LOI) is **REQUIRED** and must be received by **October 31, 2008, 5:00 p.m., Eastern Time**. The Letter of Intent should be submitted by e-mail as a PDF file attachment to: **network_research@ascr.doe.gov**. Please use "Letter of Intent for Announcement **DE-PS02-08ER08-27**" in the subject line of the email.

The purpose of the Letter of Intent (LOI) is to facilitate the planning of the peer review process and the selection of reviewers, including identifying any potential conflicts of interest. The one-page LOI must include the following information: the announcement number **DE-PS02-08ER08-27**; name, institutional affiliation, and contact information of the Principal Investigator (PI); names and institutional affiliations of other PIs and senior personnel; projected funding request (if possible); title of the proposed effort; and an abstract of the proposed research. For collaborations involving multiple institutions, a single Letter of Intent should be submitted by the PI of the lead institution. An example of the format for the one-page Letter of Intent can be viewed at: <http://www.science.doe.gov/ascr/Research/NextGen/solicitation.html>.

A response to the Letters of Intent encouraging or discouraging formal applications will be communicated to the applicants by **November 14, 2008**. **Formal applications will be accepted only from those encouraged to submit. No other formal applications will be considered.**

3. Formal Applications.

Formal applications are due **December 17, 2008, 8:00 p.m., Eastern Time and must be submitted using Grants.gov**, the Funding Opportunity Announcement can be found using the CFDA Number, 81.049 or the Funding Opportunity Announcement number, **DE-PS02-08ER08-27**. Applicants must follow the instructions and use the forms provided on Grants.gov.

F. INTERGOVERNMENTAL REVIEW.

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS.

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit.

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD. Submit electronic applications through the “Apply for Grants” function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner identification Number” (MPIN).

When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. You will know that your application has reached DOE when the AOR receives email Number 5. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria, listed in descending order of importance as found in 10 CFR Part 605.10 (d), the Office of Science Research Financial Assistance Program:

1. Scientific and/or technical merit of the project, with an emphasis on the potential impact of the research to advance the field;
2. Appropriateness of the proposed method or approach;
3. Competency of applicant's personnel and adequacy of proposed resources, with an emphasis on the future promise of the investigators as future leaders in the field;
4. Reasonableness and appropriateness of the proposed budget.

Additional criteria which will be considered, the resources and interest of the sponsoring institution.

The selected projects will be required to acknowledge support by DOE in all public communication of the research results.

The evaluation process will also include program policy factors such as the relevance of the proposed research to the terms of the announcement and the agencies' programmatic needs. Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the “Office of Science Merit Review System for Financial Assistance.” This Merit Review System is available at: <http://www.science.doe.gov/grants/merit.html>.

2. Selection.

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award.

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600 and 605; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

The DOE expects to make several awards for Fiscal Year 2009.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award.

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE; 4. DOE assistance regulations at 10 CFR Part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances to Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR Part 600 and 10 CFR Part 605 (See: <http://ecfr.gpoaccess.gov>), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements.

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm. The National Policy Assurances to Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions.

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.energy.gov/financial_assistance_awards.htm.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F4600.2, attached to the award agreement.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

B. AGENCY CONTACT:

Dr. Thomas D. Ndousse-Fetter
Next-Generation Networks for Science Program
Telephone: (301) 903- 9960, Fax: (301) 903-7774
E-mail: tndousse@er.doe.gov.

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS.

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION.

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application.

Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

N/A