

National Supercomputer Centre (NSC) at Linköping University is one of the largest Swedish academic HPC centre with 26 staff and currently managing compute resources of over 18000 CPU cores and multi-Petabyte storage facilities. NSC has been providing supercomputing resources to the Swedish academic community, the Swedish Meteorological and Hydrological Institute and SAAB for over 20 years. NSC is also part of SNIC – the Swedish National Infrastructure for Computing. Similarly to almost all HPC centres we use a Linux environment to deliver our compute resources. During 2012, a new 350+ TF cluster and additional systems will be procured at NSC.

At NSC, you will be working on challenging issues to get modern high-performance computing to function optimally. The skilled multi-national staff together has a wide range of competences, for instance to perform leading edge, scalable storage deployments, data security and integrity, system administration, optimising code for parallel systems and much more. NSC is involved in a number of international collaborations, e.g. PRACE for future European large-scale computing, EGI for the European grid infrastructure, and IS-ENES for creating a pan-European infrastructure for climate calculations.

At NSC we are in an expansive phase and are now looking for:

- One system administrator in large-scale storage solutions (*systemadministratör för storskalig lagring*) **Ref.nr LiU-2011-01768**
- One system administrator for parallel cluster (*systemadministratör för parallellkluster*) **Ref.nr LiU-2011-01769**
- One system developer with focus on storage (*systemutvecklare med inriktning på lagring*) **Ref.nr LiU-2011-01770**
- One system developer with focus on security solutions (*systemutvecklare med inriktning på säkerhet*) **Ref.nr LiU-2011-01771**
- One computational scientist for optimising HPC applications (*vetenskaplig programmerare för optimering av HPC-tillämpningar*) **Ref.nr LiU-2011-01772**

We are looking for thorough, methodical and driven people motivated by challenges and a desire to explore the forefront of technology. Further, we want you who are good at understanding user perspectives and needs. You should have a Master's degree in Computer Science or equivalent. You have likely several years of experience working in a Linux/Unix environment. For the computational scientist position, a relevant Ph.D. is required.

More details to be found at <http://www.nsc.liu.se>

## **System administrator in large-scale storage solutions (*systemadministratör för storskalig lagring*)**

Ref.nr LiU-2011-01768

Would you like to head our large scale near-line tape storage? You will work in a challenging environment in a group of highly skilled team of system experts. After an initial training period where you learn the ropes at NSC and get familiar with our active storage projects, you are eager to climb into the drivers seat and helm the fast growing deep archive and backup solution at NSC.

NSC's near-line archive is continuously expanded with the latest tape technology to house the fast growing data sets that emerge from simulations and sensors. Several large scale storage projects use the archive solution at NSC such as: Meteorological archive and retrieval system (MARS) for production and research data at Swedish Meteorological and Hydrological Institute (SMHI); The Nordic Tier 1 in the Worldwide LHC Computing Grid (WLCG); Swedish Storage Infrastructure (SweStore) among others.

### ***Work Description***

- Monitor and tune usage for best performance and availability
- Develop and tailor interfaces to storage applications
- Manage configuration, licences and software upgrades
- Track down and analyse bugs and errors
- Provide support to users
- Maintain a high level of stability, security and data integrity
- Re-evaluating best practises in terms of solution robustness and performance on a continuous basis
- Long and short term capacity planning
- Watch, evaluate and deploy new technology
- Strategic planning of future investments to meet current and future levels of accessibility on our service offerings.

### ***Qualifications***

You should be fluent in English and Linux. Python and scripting languages are tools you like to use. Linux system administration experience is essential. We prefer if you also have knowledge and experience of:

- Tape technology and tape libraries
- IBM Tivoli Storage Manager
- Relational databases and SQL
- Network protocols and performance tuning
- Deep knowledge of the Linux kernel storage subsystem and file systems
- Building and maintaining clustered storage systems.
- Master of science in in computing/IT (or similar qualifications)

## **System administrator for parallel cluster** *(systemadministratör för parallella kluster)*

Ref.nr LiU-2011-01769

### ***Work Description:***

- Administration and development of computational and storage systems in a distributed linux environment, including grid environment
- User support with a high service level is an important part of the work
- National and international collaborations
- Project leader within the area

### ***Qualifications***

The successful candidate has education within computer science, computer engineering, scientific computing, or related areas.

- System administration in linux, preferably in cluster environment
- Programming and scripting languages (C, Python, etc)
- Parallel applications and libraries (MPI, OpenMP etc)
- Network configuration
- Cluster schedulers (SLURM, Maui/Moab, Torque)
- Disk storage systems
- Tape storage systems
- Parallel distributed file systems (GPFS, Lustre)
- Development and maintenance of archives (FTP, HTTP, rsync)
- Master of science in in computing/IT (or similar qualifications)

## **System developer with focus on storage** *(systemutvecklare med inriktning på lagring)*

Ref.nr LiU-2011-01770

### ***Work Description:***

- Software development needed for storage systems in a distributed linux environment, including grid environment
- Development and maintenance of storage solutions to fit the varying needs of NSC's clients.
- Development in relevant open source project, such as iRODS and dCache. This includes collaboration in open source communities and with our Nordic sister centres.
- Development of end user interfaces to storage system that utilises for example federated login.
- The work includes re-evaluating open source project with best practises in terms of solution robustness and performance on a continuous basis
- Strategic planning of future software to meet current and future levels of accessibility on our service offerings.

### ***Qualifications***

- Masters degree within computer science (or similar competence)
- Experience from one or more of these areas:
  - System development using Java/J2EE, Python or SQL
  - Programming languages C and different script languages
  - Linux operating systems
  - Large scale storage systems, e.g. dCache, GPFS and Lustre
  - Development and versioning tools, e.g. eclips, java studio, git, SVN

## **System developer with focus on security solutions (systemutvecklare med inriktning på säkerhet)**

Ref.nr LiU-2011-01771

In the near future, NSC needs to make our computational clusters available also for analysis of person-bound information. This will require specialised security solutions that goes beyond the present secure environment provided at NSC, depending upon the needs from respective user group. Therefore, we need a developer with focus on security solutions to create new systems environments.

### ***Work Description***

- Software development needed for secure access to computational and storage systems in a distributed linux environment
- Development and maintenance of security solutions to fit the varying needs of NSC's clients.
- Evaluation and implementation of open source solutions
- Development and participation in international open source projects
- The work includes re-evaluating open source project with best practises in terms of solution robustness and performance on a continuous basis
- Strategic planning of future software to meet current and future levels of accessibility on our service offerings.

### ***Qualifications***

Masters degree within computer science (or similar competence)

Experience from one or more of these areas:

- System development using Java/J2EE, Python or SQL
- Programming languages C and different script languages
- Linux operating systems
- Large scale storage systems, e.g. dCache, GPFS and Lustre
- Development and versioning tools, e.g. eclips, java studio, git, SVN
- Secure development practices
- Authentication technologies, e.g. SAML2, OpenID, OAuth, two-factor solutions
- Technologies for transport encryption and encryption of data at rest

## **Computational scientist for optimising HPC applications** *(vetenskaplig programmerare för optimering av HPC-tillämpningar)*

Ref.nr LiU-2011-01772

We are looking for an individual with a proven track record as a Computational Scientist. The computer resources at NSC are used by research groups all over Sweden within different areas such as physics, chemistry, bioinformatics, fluid dynamics and meteorology/climatology. NSC is also involved in several EU projects within these areas.

### ***Work description:***

- Work with application scientists to make sure their applications function well in the NSC environment, including error tracking, code tuning and optimisation.
- Work with tuning and optimising applications for massively parallel systems, as a part of the European PRACE project.
- Participate in national and international projects.
- Serve as a liaison between NSC and the users of our computational resources at the universities of Sweden and our partners SMHI and Saab.
- Investigate users' needs and do strategic planning for decision-making regarding future computational and storage resources at NSC.
- Organise dissemination activities, such as seminars, courses, visits to research groups all over Sweden, and web-based documentation within the area.

### ***Qualifications***

The successful candidate has education within numerical analysis, computer sciences, scientific computing, and related areas within the fields of technology and/or natural sciences. A Ph.D. in relevant area is required.

- Application areas within high-performance parallel computing
- Performance analysis/tuning/optimisation and error tracking of parallel applications.
- Numerical algorithms for scientific calculations
- Parallel algorithms
- MPI/OpenMP/Fortran90/C
- Script languages in Unix/Linux environment

### **Further experience that would be meriting:**

- Work with scientific applications on parallel computers
- Software development in large projects
- Hybrid (MPI+OpenMP) programming
- Linux clusters.
- MATLAB

## **For all positions the following applies**

The candidate must have very good knowledge of the English language and preferably a working knowledge of Swedish. Good written and verbal communication skills for internal and external interactions and presentations.

LiU shall continue to develop as an attractive and creative work place characterised by equal opportunities, and therefore works actively to promote diversity and gender equality. A majority of the technical experts within NSC are men, which is why precedence will be given to women in cases where qualifications are deemed otherwise equivalent.

**Starting date:** By agreement.

**Salary:** The university applies individual salaries according to the applicant's competence and the market. Please notify your salary desires in the application.

### **Further information**

Director of NSC Bengt Persson , tel +46-13-28 29 83 e-mail [bpn@ifm.liu.se](mailto:bpn@ifm.liu.se). The union representatives are: Örjan Lönnevik (SACO), tel +46-13-28 66 34 e-mail [orjan.lonnevik@liu.se](mailto:orjan.lonnevik@liu.se), Ingo Hölscher (OFR/S) tel +46-13-28 40 15, e-mail [ingo.holscher@liu.se](mailto:ingo.holscher@liu.se) and Kenneth Lindh (SEKO) tel, +46-13-28 16 98. HR officer Eva-Britt Berglund, tel +46-13-28 14 50 e-mail [eva-britt.berglund@liu.se](mailto:eva-britt.berglund@liu.se) gives information regarding terms of employment and the formal procedures.

### **Application procedure:**

Your application marked with the corresponding Registration number for the relevant position accompanied by the list of your personal qualifications and other documents you may wish to refer to.

Electronic documents must be sent as PDF or Word file.

The application must reach the University Registrar no later than **16 December 2011** at the following address:

Linköpings universitet  
Registrar  
S-581 83 Linköping  
Sweden

E-mail address:  
[registrator@liu.se](mailto:registrator@liu.se)