

LUNARC Townhall meeting Making your voice heard

Jonas, Anders och Erik



Schedule

- Introduction and welcome
- What is LUNARC
- User presentations 10.20 11.20
- Breakout-sessions 11.20 12.10
- Summary 12.10 12.30



Breakout session topics

- Group 1 I am planning to use LUNARC. How can I benefit from LUNARC resources and knowledge?
 - https://padlet.com/jonaslindemann/group1
- Group 2 I have recently started to use LUNARC. How can LUNARC improve the experience of its resources and services?
 - https://padlet.com/jonaslindemann/group2
- Group 3 I am long-standing LUNARC user. How can LUNARC provide better resources and services in the future?
 - https://padlet.com/jonaslindemann/group3

More information and questions

- Web <u>www.lunarc.lu.se</u>
- Phone 046 222 44 54
- Twitter @LUNARC_LU
- Director
 - Jonas Lindemann jonas.lindemann@lunarc.lu.se
- Deputy Director / Technical Director
 - Anders Follin anders.follin@lunarc.lu.se



What is LUNARC









Usability (visualisation, user interfaces) Training (new users, advanced users) Outreach (close to research groups)

Founded by researchers for researchers



LUNARC Now and then



LUNARC Background

Founded in 1986 as a collaboration between Theoretical Chemistry, Physical Chemistry & Structural Mechanics

Original meaning:

Lund

- University
- Numeric Intensive
 Computation
- Application
- Research
- Center





LUNARC 1986 - 2021

HPC – High Performance Computing

• LUNARC has evolved from being a small local HPC center to a full-fledged supercomputer and competence center with more than 1500 users.



LUNARC 2021

- LUNARC is not only hardware operator
- Created for researcher by researchers
- LUNARC provides
 - Development of customized technical solutions (hardware and software and work flows) for research groups in different areas.
 - Experts for parallel programming, MATLAB, Python, visualization and more
 - Education and training
 - Operation and maintainance of high performance computer systems
- LUNARC is also member of SNIC
 - SNIC = Swedish National Infrastructure for Computing



LUNARC Experts and advisors

- Joachim Hein
 - AE Parallel programming SNIC
 - SNIC Training
 - COMPUTE Study director
- Roger Larsson
 - Project manager / Developer
- Monica Lassi
 - Senior advisor for NeIC and SNIC
- Jonas Lindemann
 - Visualisation, Usability and Python
- Anders Follin
 - Workflows / Visualisation
- Emanuel Larsson
 - Imaging and tomography expert for LUNARC and QIM



- Anders Sjöström
 - MATLAB expert
 - CIPA coordinator
 - SNIC AE Coordinator
- Magnus Ullner
 - Application expoert in Theoretica Chemistry
 - SUPR/SLURM/Statistics



LUNARC System experts



- Tore Sundkvist
 - Cluster and storage
- Robert Grabowski
 - Monitoring, virtualisation and grid services
- Marcos Acebes
 - Cluster, storage and software
- Alex Contis
 - Security and backup
- New person soon
 - MAX IV / LUNARC integration



LUNARC Leadership

- Erik Swietlicki
 - Chairman of the board
- Jonas Lindemann
 - Director
- Anders Follin
 - Deputy Director
 - Technical
 Director







Vision



Provide efficient and easy to use resources for all researchers



LUNARC resources must be user focused and user driven

%

HO

Users shouldn't have to adapt to complex resources



Education and Training

Education and training

- Seminars on the usage of the resources (~30)
- Workshops around special topics (5-10)
- Courses in parallel computing (2-3)
- Courses in SeSE (1-2 / year)
 - Introduction to Scientific Computing I (Python/Fortran)
 - Introduction to Scientific Computing II (C++)
- Courses in COMPUTE (2-3 / year)



Example of courses and workshops

- Cluster architecture and job submission
- Introduction to data handling using R
- SNIC and SNAC: Handling of large-scale computer time allocations in Sweden
- Debugging of HPC applications
- An introduction to UNIX/LINUX
- Artificial Intelligence Workshop with IBM
- Making your research data fit for a future of open science and open data
- Transferring data to and from an HPC system
- Visualisation and interactivity in HPC The LUNARC HPC Desktop
- Introduction to Scientific Computing



Computing Visualisation Storage



Flexible and efficient software environment



EasyBuild is used for most software installations

Provides ~700 tuned packages related to Scientific Computing

All packages build from source and tuned for performance

Built software is automatically installed as a module

"Focus more on helping users with their code, than building software"



LMOD module system

Supports hiearchical module system Backwards compatible with other module-systems



Available software

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Searching available software

- ml-browse
- Tool for finding and using software in the module tree
- Automatically loads selected modules
- Show versions and dependencies

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Lunarc accelerated HPC Desktop (since 2012)

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(Shared Graphics Application Server)



(On-Demand application launcher, Linux – Request a full server for your own use)



(On-Demand application launcher, Windows 10. Request a full server for your own use)



(Interactive session with multiple operating systems – Linux & Windows 10)





Expertise

Implementation projects (selection)

- LBIC (Lund University Bioimaging Center) IT infrastructure
- LBIC 7T Human MRI Scanner– Project Lead Data Management
- MAX IV SDM (Scientific Data Management). Infra structure for compute, storage and visualisation
- Technical architecture, installation och deployment of 15 large size compute clusters and 3 large parallel file systems
- Development of accelerated remote visualization solution supporting both Linux och Windows
- Development of On-Demand visualisation service (L-VIS)
- Architecture and implementation of compute and storage cluster for sensitive data (L-SENS gen1 & gen2)
- Parallel automatic data transfer (L-SHIP)
- Simplified access to national storage (SNIC Storage Explorer)



User presentations

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COSMOS

Auser focused, flexible and green high-performance resource for computation, visualization and storage at LU

Breakout sessions

I am planning to use LUNARC – Group 1

- How can I benefit from LUNARC resources and knowledge?
 - Are your computing needs growing larger than your computer?
 - Curious about what LUNARC can offer for you or your research group?
 - Is it free? How can it be free?



I have recently started to use LUNARC – Group 2

- How can LUNARC improve the experience of its resources and services?
 - What made you apply for LUNARC resources?
 - What could improve your scientific workflow?
 - Do you have questions regarding the use of LUNARC services?
 - Is there any research you can't do today at LUNARC?
 What do you need to be able to do this?



I am long-standing LUNARC user – Group 3

- How can LUNARC provide better resources and services in the future?
 - What would make your workflow more efficient? What is needed to achieve this?
 - Are you interested in taking part in the development of future LUNARC services?
 - Are there other services you think LUNARC should provide?
 - Is there any research you can't do today at LUNARC?
 What do you need to be able to do this?
 - What are your future needs/requirements?



Breakout session topics

- Group 1 I am planning to use LUNARC. How can I benefit from LUNARC resources and knowledge?
 - https://padlet.com/jonaslindemann/group1
 - Melvyn Davies / Anders Sjöström
- Group 2 I have recently started to use LUNARC. How can LUNARC improve the experience of its resources and services?
 - https://padlet.com/jonaslindemann/group2
 - Joachim Hein / Marcos Acebes / Magnus Ullner
 - Group 3 I am long-standing LUNARC user. How can LUNARC provide better resources and services in the future?
 - https://padlet.com/jonaslindemann/group3
 - Anders Follin / Jonas Lindemann

Summary and Q.S.A

More information and questions

- Web <u>www.lunarc.lu.se</u>
- Phone 046 222 44 54
- Twitter @LUNARC_LU
- Director
 - Jonas Lindemann jonas.lindemann@lunarc.lu.se
- Deputy Director / Technical Director
 - Anders Follin anders.follin@lunarc.lu.se