Outline

- SURF / SURFsara
- Computing Services
- Storage / Data Management
- Access to SURF Compute
- HPC Trainings/courses
- If time permits:
  - Discussion/Possible Use cases
SURF: National e-infrastructure in the Netherlands

- **SURF SARA**: High-performance computing, data and visualisation for science
- **SURF NET**: Connects users and ICT services and creates new functional possibilities
- **SURF Science Center**: Reinforces and accelerates multi-disciplinary and data-intensive research
- **SURF Market**: Favourable conditions for ICT services, software, content

Research workflow optimisation
• 1971 – founded as SARA
• 1984 – first national supercomputer
• 1995 – independent
• 2008 – split Vancis / SARA
• 2012 – new name SURFsara
• 2013 – merger to co-operative SURF
## Computing services

<table>
<thead>
<tr>
<th>Service</th>
<th>Intended for</th>
<th>Examples</th>
<th>Required experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cartesius</strong></td>
<td>Large scale analysis, capability computing</td>
<td>Climate models, Machine learning</td>
<td>**</td>
</tr>
<tr>
<td><strong>LISA (cluster)</strong></td>
<td>Batch processing</td>
<td>Genomic imputations</td>
<td>**</td>
</tr>
<tr>
<td><strong>HPC Cloud</strong></td>
<td>Interactive applications, service hosting,</td>
<td>Galaxy, interactive visualisations</td>
<td>*</td>
</tr>
<tr>
<td><strong>Grid</strong></td>
<td>Parameter sweeps, trivial parallel applications</td>
<td>Genomic alignment</td>
<td>*****</td>
</tr>
<tr>
<td><strong>Big data services</strong></td>
<td>Exploration of large amounts of data</td>
<td>Searching web archives, Twitter analysis</td>
<td>**</td>
</tr>
</tbody>
</table>
## Differences Lisa / Cartesius compared to own PC

<table>
<thead>
<tr>
<th>Cartesius / Lisa</th>
<th>Own computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>Windows, macOS, Linux (maybe)</td>
</tr>
<tr>
<td>Shared with others</td>
<td>Single user access</td>
</tr>
<tr>
<td>Access via secure shell (SSH)</td>
<td>Access directly</td>
</tr>
<tr>
<td>Mostly text based (Terminal)</td>
<td>Mostly Graphical User Interfaces</td>
</tr>
<tr>
<td>Compute/Analyses tasks via queue</td>
<td>Compute/Analyses tasks directly</td>
</tr>
</tbody>
</table>
Schematic overview of Lisa / Cartesius
HPC Cloud

When to use HPC Cloud
• "Big Laptop" required
• More cores
• More memory
• (Limited) possibility to have Virtual machines (VMs) communicate

Workflow
• Login to HPC Cloud portal (website)
• Create or upload you Virtual Machine
• Start it from within the portal
• Use it interactively with a viewer (Remote Desktop)
→ Check [https://doc.hpccloud.surfsara.nl/](https://doc.hpccloud.surfsara.nl/) for more information!
Big Data Services

- Scalable data analytics with Spark
- Simple but powerful interface for researchers
- Text mining, machine learning, genomics, geoinformatics
- Flexible, custom infrastructure with Kubernetes container orchestration
- SURF Jupyter Notebook service for courses and reproducible research
- Spark courses and workshops
# National (pre-funded) e-infrastructure allocation quota

<table>
<thead>
<tr>
<th>Service</th>
<th>Max cpu request</th>
<th>Max storage request</th>
<th>User support</th>
<th>Delivery Model</th>
<th>Request through</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartesius</td>
<td>30M SBU</td>
<td>100s of TBs</td>
<td>4 hours*</td>
<td></td>
<td>NWO</td>
</tr>
<tr>
<td>LISA</td>
<td>3M SBU</td>
<td>200 GB per user</td>
<td>4 hours*</td>
<td></td>
<td>NWO</td>
</tr>
<tr>
<td>HPC Cloud</td>
<td>70K core hours</td>
<td>2 TB</td>
<td>4 hours</td>
<td></td>
<td>SURF</td>
</tr>
<tr>
<td>Grid</td>
<td>4M core hours</td>
<td>200 TB disk, 250 TB tape</td>
<td>250 hours</td>
<td></td>
<td>SURF</td>
</tr>
<tr>
<td>Big data services</td>
<td>-</td>
<td>25 TB</td>
<td>4 hours</td>
<td></td>
<td>SURF</td>
</tr>
</tbody>
</table>

* Separate funding opportunities available for code optimisation

- B2C, Apply as individual
- B2C, Apply as project
- B2B, Institutional subscription
## Data services

<table>
<thead>
<tr>
<th>Service</th>
<th>Features</th>
<th>Intended for</th>
<th>Long/short term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data ingest service</td>
<td>Disk read-out system</td>
<td>Large data volumes transported on hard drives</td>
<td>Short</td>
</tr>
<tr>
<td>ResearchDrive</td>
<td>Webdav, ownCloud</td>
<td>General storage functionality, provides access to several resources</td>
<td>Short/long term</td>
</tr>
<tr>
<td>SURFdrive</td>
<td>DropBox like</td>
<td>Online collaboration</td>
<td>Short term</td>
</tr>
<tr>
<td>SURFfilesender</td>
<td>WeTransfer like with encryption</td>
<td>Online collaboration</td>
<td>Short term</td>
</tr>
<tr>
<td>HPC central data archive</td>
<td>Tiered, Dual copies, supports NFs/ ssh/scp/gridFTP</td>
<td>For use with super compute facilities</td>
<td>Long term preservation</td>
</tr>
<tr>
<td>EUDAT B2- services (e.g. B2Share)</td>
<td>...</td>
<td>Curation/Preservation</td>
<td>Long term preservation</td>
</tr>
<tr>
<td>PID service</td>
<td>Identifier service for datasets</td>
<td>Publishing data</td>
<td>Long term</td>
</tr>
</tbody>
</table>
Access to SURF Compute

- Requests for (pilot) projects Lisa & Cartesius via NWO:
  - Using the ISAAC portal:
- Direct Access to SURF e-Infra
  - https://e-infra.surfsara.nl
- Via your local, own university
  - https://userinfo.surfsara.nl/systems/shared/rccs
- Documentation
  - http://userinfo.surfsara.nl
- Questions? → helpdesk@surfsara.nl
Training & Support

Request information about training courses

- Introduction to big data and Hadoop
- Introduction to Unix
- Introduction to MPI
- Introduction to Intel Xeon Phi training
- Introduction to GPU programming
- Introduction to Visualisation
- Getting started with HPC Cloud
- Getting started with the Hadoop-cluster
- Getting started with Grid computing
- Getting started with the Cartesius supercomputer and the national compute cluster Lisa
- Getting started with iRODS and EUDAT datamanagement

- [http://hpc.uva.nl](http://hpc.uva.nl) (June 2018)
- [http://surfresearchbootcamp.nl](http://surfresearchbootcamp.nl) (November 2nd, 2018)
- [https://hpc.labs.vu.nl](https://hpc.labs.vu.nl) (Autumn 2018)
Many thanks!