CSC's services for researchers

Non-profit state organization with special tasks

Turn over in 2018
44,9 M€

CSC

Headquarters in Espoo, datacenter in Kajaani

Owned by state (70%)
and all Finnish higher education institutions **(30%)**

Circa
350
employees in 2018

Our customers

Researchers,
research institutes and
organizations

Organizations providing
education

Memory organizations,
state and public
organizations

Thanks to our agreement
with the Ministry of Education and Culture, our services targeted at researchers are largely free of charge!

Support in all of the phases of a research process

CSC's solutions

Computing and software

Data management and analytics for research

Support and training for research

Research administration

Solutions for managing and organizing education

Solutions for learners and teachers

Solutions for educational and teaching cooperation

Hosting services tailored to customers' needs

Identity and authorisation

Management and use of data

ICT platforms, Funet network and data center functions are the base for our solutions

CSC's Current Computing Services available for research and education

High Performance
- Sisu
- Massive parallelism
- Fast interconnect

Capacity
- Taito
- General use
- Large memory
- >100 applications

Accelerated
- Taito extension
- Visualization
- Special codes
- Nvidia GPU

Cloud
- IaaS: cPouta + ePouta (OpenStack)
- PaaS: Rahti (OpenShift / Kubernetes)

Hosting
- Kajaani
- Espoo
- Efficient and secure datacenters
- Virtual and physical servers

Storage Services: Fast parallel storage, Object Storage, Archiving

CSC's Cloud Services

- Community IaaS Cloud
  - Services accessible over internet
- Powered by OpenStack
- ISO27001 Certified
- In Production since 2013
- Web UI, CLI & REST APIs supported
- ~ 7500 Cores, ~ 2.7 PB Raw CEPH Storage, 24 GPGPUs

cPouta

- Community IaaS Cloud for Sensitive Data Processing
  - Services accessible only from customer network
- Powered by OpenStack
- ISO 27001 Certified
- In Production since 2013
- Web UI, CLI & Rest APIs supported
- ~ 11000 cores, 1.6 PB raw CEPH Storage, 1.5 PB NetApp & 4 GPGPUs

ePouta

- Community PaaS Cloud leveraging Docker containers
  - Services accessible over internet
- Powered by OpenShift
- In Closed Beta Phase
- WebUI, CLI & Rest APIs supported

Rahti

Pouta Clouds

- VMs
- Oversubscribed or dedicated CPUs
- GPUs

Compute

- Volume Storage
- Object Storage*

Storage

- 10, 25 or 40 GbE

Private VLAN

- GPU
- IO
- HPC
- Standard

Hardware Options

- With Latest Security patches

Images

- Full programmability of your resources

API

Rahti Cloud

What?

Container cloud platform based on OpenShift - Red Hat's distribution of Kubernetes. Runs applications packaged as containers.

Why?

Containers allow a streamlined, easy-to-deploy and secure method of implementing specific infrastructure requirements. An alternative to virtual machines.
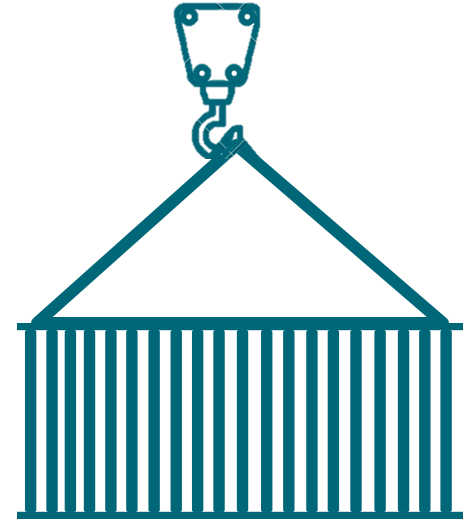
Status

Currently in closed beta.
Production in 2019 - open beta before that.

More information:

https://rahti.csc.fi
https://rahti-intro.rahtiapp.fi/#/

# Notebooks – great introduction to CSC computing services

- Notebooks is a web based environment primarily for education and data analysis.

- You can log into the Notebooks service using the user access of your institution (via Haka) and immediately start to use various analytics applications, such as RStudio and Jupyter.

- Notebooks is suitable in particular for minor experiments and teaching, as it is extremely quick and easy to implement.

- https://notebooks.csc.fi

Software and databases

- CSC provides researchers the largest collection of scientific software and databases in Finland.

- The list of pre-installed and supported scientific software packages can be found at: https://research.csc.fi/software

- Information about database services:
  - https://www.csc.fi/tutkimuksen-tietokantapalvelu
  - https://www.csc.fi/tietokantapalvelu-kaivos

Fairdata.fi

- National integrated services for storing, describing and sharing and preserving research data

- Provided by MinEdu

- Produced by CSC and National Library of Finland

- **Make your data safe , documented and citable**
    - **IDA** – Research data storage service
    - **ETSIN** – Research data finder
    - **QVAIN** – Research dataset metadata tool
    - **FAIRDATA-PAS** – Digital preservation for research data
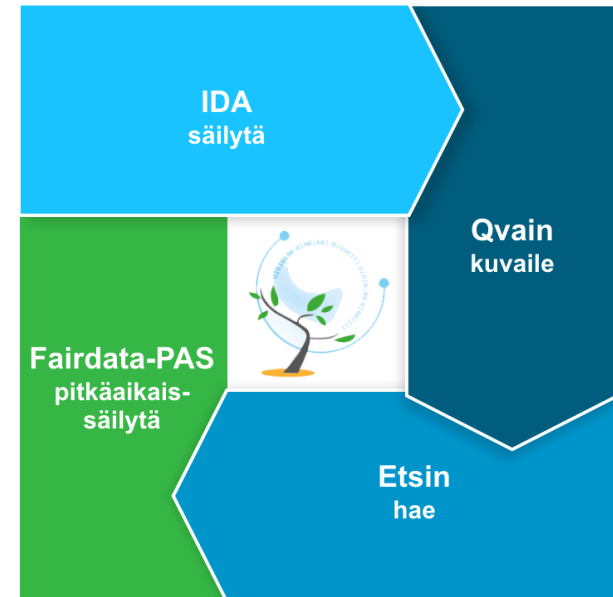
Services for finding research data

- With ETSIN and B2FIND SERVICE you can easily find data for your research

- AVAA is a publication platform where you can seek and download open research data.

- THE LANGUAGE BANK OF FINLAND is a service entity for researchers who use text and speech corpora. The basic use is free of charge to researchers and students.

- PAITULI is a download service of Finnish spatial data. The service contains spatial data that is important in research and education. It deviates from many other similar services as it also contains historical year versions.

- ELIXIR offers services for medical and bioinformatics research.

- VIPUNEN is a statistics service provided by the Finnish National Board of Education where you can find information on, for example, education in a number of educational sectors, research conducted in higher education institutions and the educational structure of the population.

Storage - active data

- **Allas** service provides a cross-platform service for storing and sharing data. Data Objects can be uploaded to this service from CSC environment as well as environments outside CSC. Data can also be shared Internet

- CSC computing environment offers user and project directories for active data as well as an archive. This storage environment is accessible from CSC computing & cloud environment.

- Storage in cloud environments is provided for computing, processing and analyzing data.

- Databases for research are available for computing projects by CSC users. Access to the databases is through the CSC computing & cloud environment. Databases are also provisioned separately, contact Service Desk for more information.

Storage - stable data

- Fairdata IDA is used for storing and sharing stable research data. Data can be shared and metadata published via additional services. The service is accessible from the Internet and CSC computer environment.

- EUDAT B2SHARE is a storage and sharing service for openly licensed research data in European collaboration. Access is from the Internet and CSC computer environment.

- Fairdata PAS is a digital preservation service for research data. Digital preservation refers to the reliable preservation of digital information for several decades or even centuries.

Training services

- Annually about 70 training events for Finnish universities and research institutes: courses, workshops, seminars and webinars

- Lecturers and trainers are leading experts

- Training aimed to familiarize you with the CSC infrastructure and its efficient use

- Courses can be customized according to your needs

- Information and registration for upcoming trainings and learning materials can be found in **CSC's training portal** www.csc.fi/training

- If you have questions related to CSC's training services, contact **courses@csc.fi**

New computing and data environment

New challenges

Large scale simulations

- For example climate change, space weather, fusion reactors, astronomical phenomena, particle physics

Mid-scale simulations

- For example materials science, energy technology, GIS

Data-intensive computing

- For example computational econometrics, bioinformatics, language research

Data-intensive computing for sensitive data

- For example medical research, register research

Artificial intelligence

- For example natural language research, business applications, computer vision

Internet of Things (IoT) and data streams

- For example satellites, weather stations, sensor networks

Puhti Computing cluster

- New computing cluster supporting a wide range of use cases
  - CPU with improved support for AI inference workloads
  - Nodes with ange of memory and disk configurations
  - GPU nodes for AI model training

- About 28 000 Intel Xeon Scalable CPU cores
  - 20 cores per CPU, 40 cores per node running at 2.1 GHz
  - 96 – 750 GB per CPU

- AI partition with 320 NVIDIA Volta GPUs

- 4 Petabytes work disk for data under active use

Mahti Supercomputer

- **New supercomputer in Early 2020**
  - Next generation AMD Rome system CPUs
  - 200 000+ cores in total
  - Especially for large scale simulations, but also for other use cases
 - 8 Petabytes of work disk

Allas – object storage

- Allas is new storage service for all computing and cloud services
  - Meant for data during project lifetime

- **12 Petabytes** of storage space

- Data can be stored and retrieved directly from anywhere in Internet
  - CSC supercomputers
  - Local workstation
  - Measurement devices
  - …
  - At simplest, web browser is enough

- Easy sharing of data outside project
  - Selected data can be shared publicly to Internet

In customer use end of Q2 / 2019

How to get access?
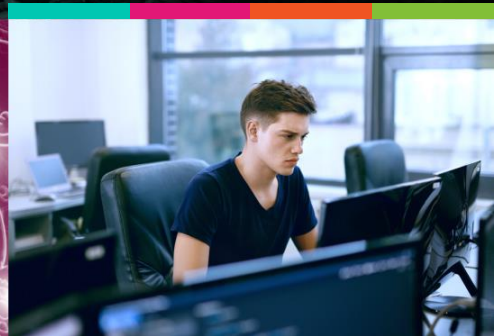
How to get access?

- **Your Haka user ID is your access to more than 160 services.**
  - o Web based services ready to use
  - o Register to get a personal CSC user account
  - o If your organization does not have Haka, contact servicedesk@csc.fi

- **Through the contact persons in your own organization**
  - o Project supervisor applies for resources and services, and can invite other people to projects
  - o IDA has contact persons in customer organizations
    - o https://www.fairdata.fi/en/ida/becoming-an-ida-user/

- **Customer service**
  - o Instructions https://research.csc.fi/accounts-and-projects
  - o Support and guidance **servicedesk@csc.fi**
  - o Weekdays 8.30–16.00.

Questions?

Information about CSC in general: www.csc.fi

Information for researchers: research.csc.fi

Up-to-date information about new computing and data environment: research.csc.fi/dl2021-utilization