SURF services portfolio

Version: 25 February 2025

8 service domains

More than 100 educational and research institutions in the Netherlands cooperate in SURF to pool scarce resources and expertise, avoid duplication, streamline innovation and use resources efficiently. This collaborative approach is central to SURF's mission. In the SURF cooperative, we work together to develop or jointly procure reliable, state-of-the-art facilities and services. We do this across 8 service domains, each designed to address specific and widely-perceived needs in the education and research sector. Each service domain represents a collection of similar services, applications, knowledge and joint activities.

Identity & access management
Provides cross-sector IT infrastructure to manage identities and access based on mutual collaboration, standardisation and trust. This allows for easy access to systems of different institutions and service providers.

Network connectivity
Ensures robust and reliable connections between institutions, individuals and services – both nationally and internationally – thereby enabling seamless cooperation.

Security
Delivers solutions to protect data, privacy and infrastructure so that together we can ensure a safe and secure digital environment for education and research.

Compute
Provides powerful computing facilities and infrastructure to support complex simulations and research.

Storage & data management
Provides services for storage, processing and sharing of research data throughout the life cycle of the data so that it is processed securely, reliably and sustainably while safeguarding public values.

Publishing
Takes care of tools and platforms for sharing and disseminating research results and educational resources to promote open knowledge sharing.

Flexible education
Facilitates the development of an agile and flexibly organised education system so that students have more agency over their learning pathways.

Procurement & delivery
Optimises procurement and delivery of IT resources and content by pooling demand and issuing joint tenders to ensure optimal user conditions and opportunities for the institutions.

Our structured approach with these 8 service domains allows us to collectively cover essential elements of the digital infrastructure that are needed for state-of-the-art education and research.

Identity and access management

Access managed securely and reliably

In the SURF cooperative, we work towards better and more agile research and education in the Netherlands. We are committed to ensuring security, autonomy, inclusion and accessibility for all stakeholders, be it students, lecturers, researchers, staff members or guest users.

Mutual collaboration, standardisation and trust are essential to enable and simplify access to the systems of different institutions and service providers. We translate this into a cross-sector IT infrastructure for managing identities and access; in other words, who has access to which systems and when. Scalable and flexible. Globally connected while remaining locally rooted in the Netherlands.

Institutions in the SURF cooperative work on this infrastructure together, but each under its own direction and responsibility. They do this by:

➢ Sharing and further developing a vision on and expertise in Identity Access Management.
➢ Establishing agreement frameworks.
➢ Developing and updating solutions to manage identities and access (SURF Access).

Expertise

In the SURF cooperative, we share knowledge and develop a joint vision on Identity Access Management themes in workshops and knowledge sessions.
Additionally, we establish **agreement frameworks** to safeguard trust, privacy and security. We monitor and, where necessary, influence national and European regulations and other relevant developments and translate these into solutions for the stakeholders in SURF.

SURF Access

SURF Access is an integrated solution based on open standards for **managing identities** of individuals (students, lecturers, researchers, staff members and guest users) and **access to digital resources and applications** in Dutch education and research. Safe and straightforward.

1. Secure access
Solutions to facilitate access to applications for specific users.

A single interface These solutions provide an interface for applications and institutions to which you connect once and are then directly linked to other connected applications and institutions. Institutions and applications set the interface up themselves based on their own governance and processes within the SURF framework. This way, they can safeguard security and mutual trust.

Authorisation
The solutions offer flexible and role-based authorisation management which can be:

➢ coarse-grained and centrally organised for the entire institution;
➢ fine-grained and decentrally organised for research collaborations;
➢ flexible for internal and external users.

2. Reliable identity
Solutions to manage reliable identities.

eduID: A single reliable digital identity for everyone who wants to log in to all affiliated institutions and services, such as:
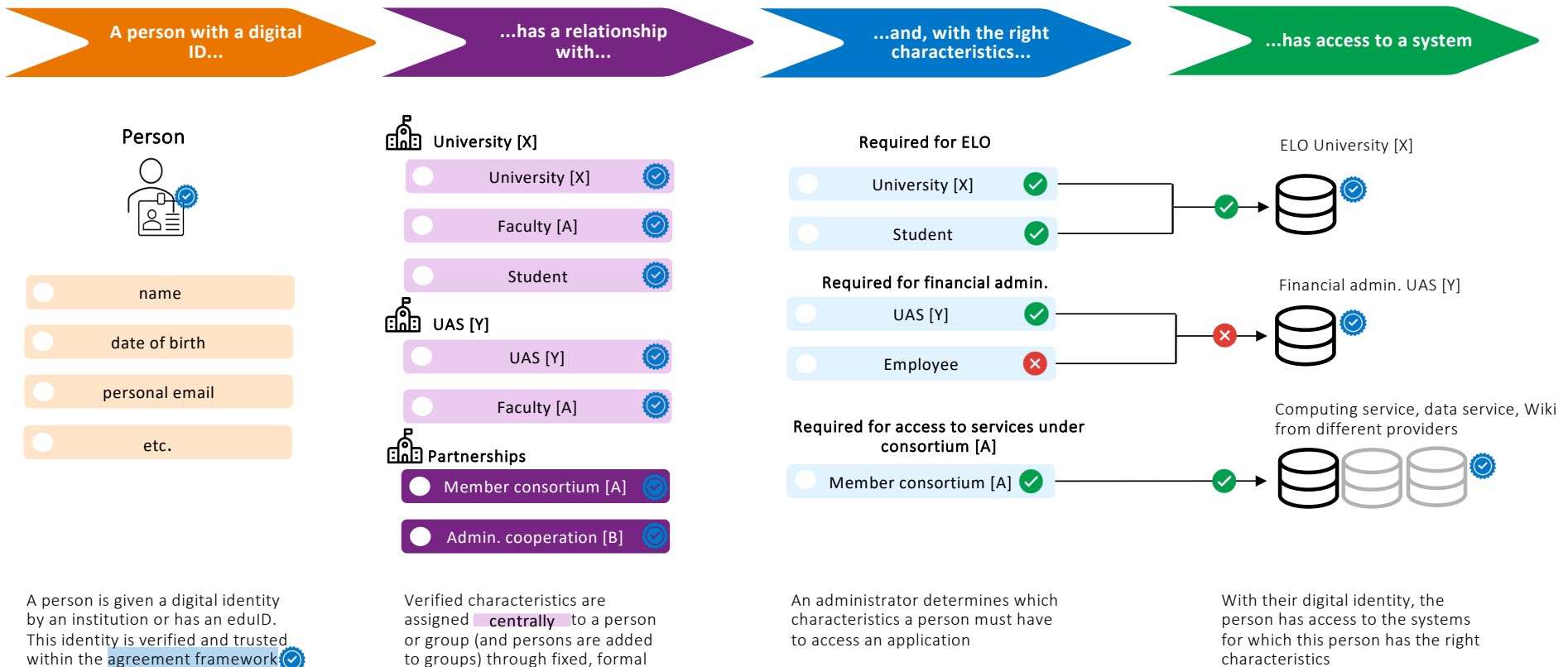
➢ Students: before, during and after their studies
➢ Researchers
➢ Lecturers and staff members
➢ Access for external/guest users

Institution IDs: Assistance for IDs of Dutch and international institutions when logging in to the systems of institutions and services during studies or appointment.

Extra reliable login: for services with sensitive data or to prevent the abuse of accounts. Additional security for access to a service with Multi-factor authentication or other additional security measures.

Students *do* have access to ELO but *not* to financial administration

| A person with a digital ID... | ...has a relationship with... | ...and, with the right characteristics... | ...has access to a system |

Person

- name
- date of birth
- personal email
- etc.

University [X]

- University [X]
- Faculty [A]
- Student

UAS [Y]

- UAS [Y]
- Faculty [A]

Partnerships

- Member consortium [A]
- Admin. cooperation [B]

Required for ELO

- University [X] ✓
- Student ✓

→ ELO University [X]

Required for financial admin.

- UAS [Y] ✓
- Employee ✗

→ Financial admin. UAS [Y]

Required for access to services under consortium [A]

- Member consortium [A] ✓

→ Computing service, data service, Wiki from different providers

A person is given a digital identity by an institution or has an eduID. This identity is verified and trusted within the agreement framework.

Verified characteristics are assigned centrally to a person or group (and persons are added to groups) through fixed, formal processes and roles.
Or this is delegated to group administrators, for example.

An administrator determines which characteristics a person must have to access an application

With their digital identity, the person has access to the systems for which this person has the right characteristics
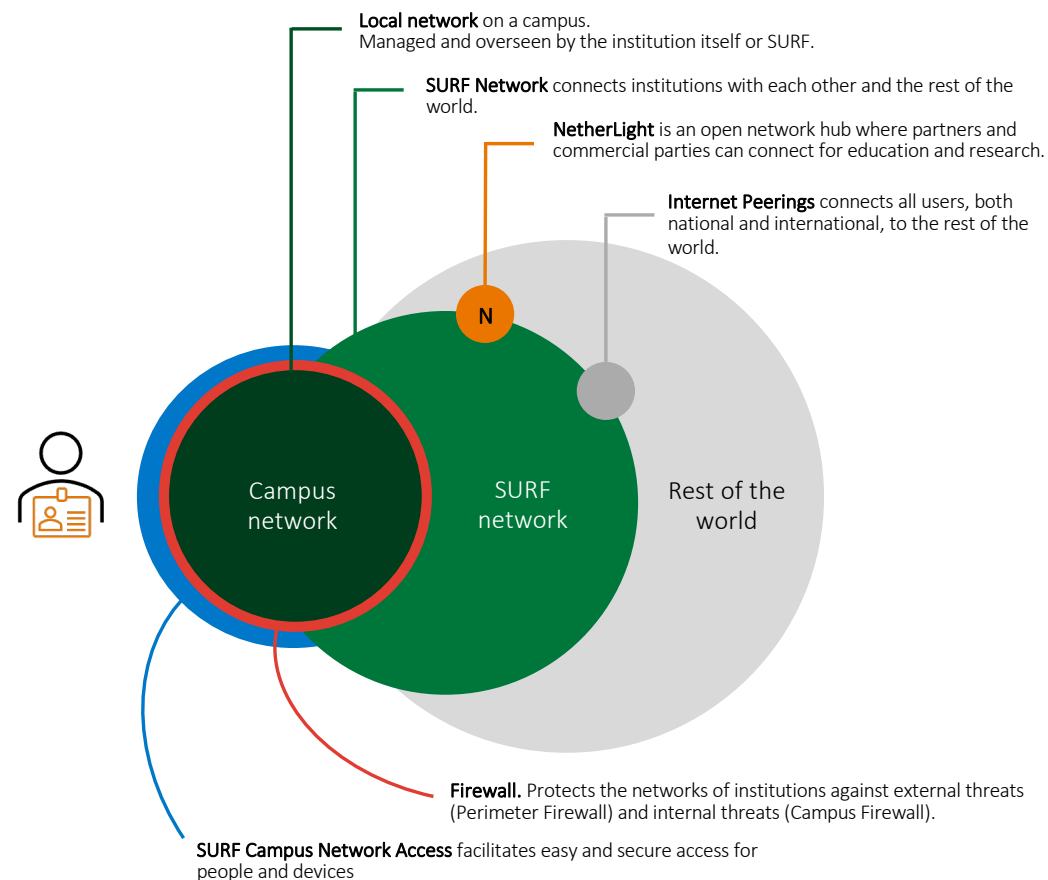
SURF

Network connectivity
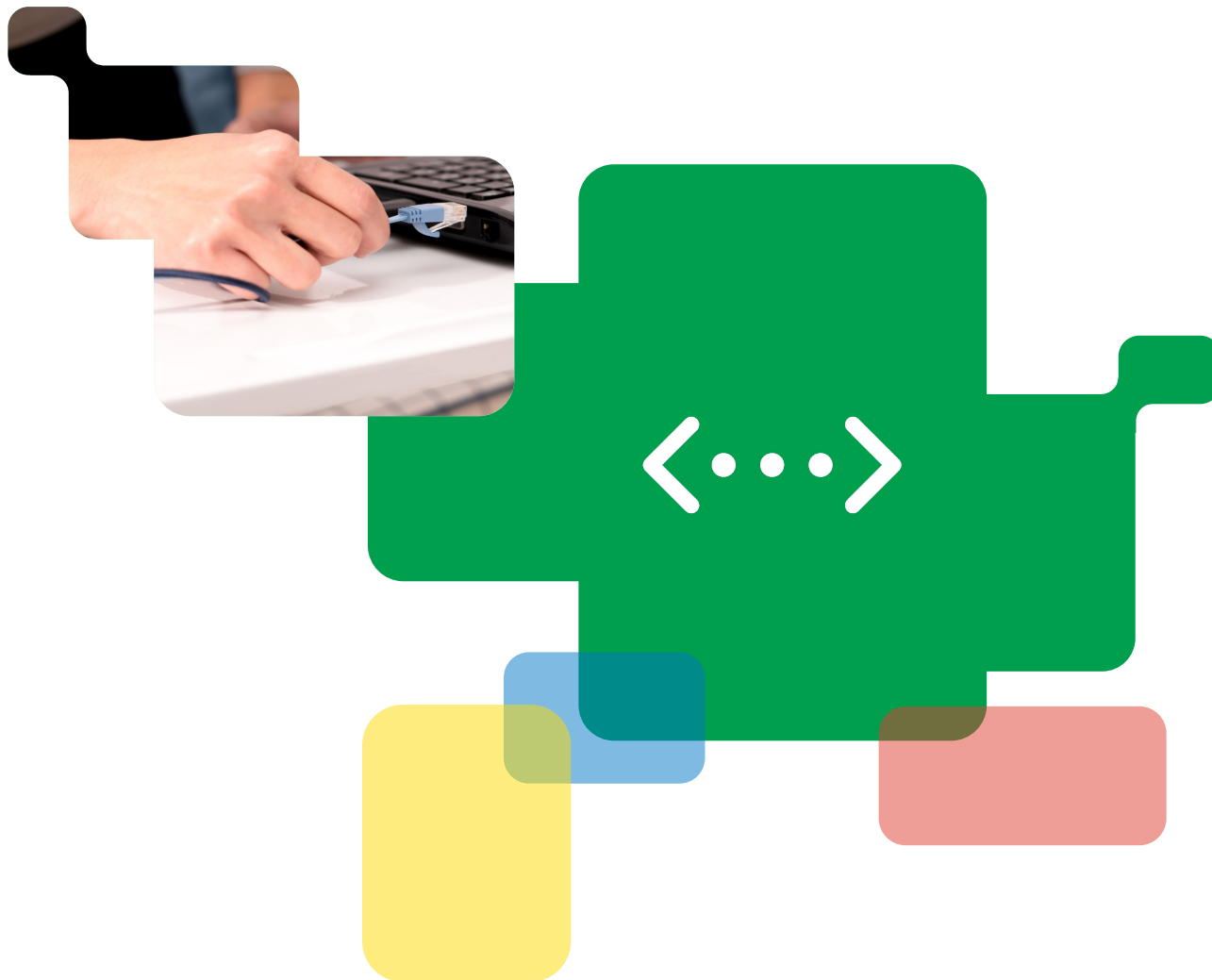
Seamlessly and reliably connected with each other

In education and research, being connected is vital. SURF's network connectivity connects people, institutions, services and devices, and facilitates barrier-free collaboration worldwide. Reliable, secure and high-quality technology is essential for optimal cooperation, By providing robust infrastructure, services and expertise, we support the innovation and progress needed to shape the future of education and research.

Under the SURF umbrella, institutions work together with national and international partners in education and research (as well as suppliers) in three areas to achieve barrier-free and reliable network connectivity:

➢ **Taking a leading position is essential**. We need the latest, most advanced technology to bring about the desired connectivity and achieve our ambitions in education and research. This is why we carry out ongoing research and continuously innovate and improve our solutions.
➢ **Unlimited possibilities**. In coordination with members but also external parties, we offer specialised network solutions that meet complex and demanding needs and international standards.
➢ **For all of us**. All members benefit from our state-of-the-art network connectivity, which we develop with the knowledge and experience gained through our continuous efforts.

Local network on a campus.
Managed and overseen by the institution itself or SURF.

SURF Network connects institutions with each other and the rest of the world.

NetherLight is an open network hub where partners and commercial parties can connect for education and research.

Internet Peerings connects all users, both national and international, to the rest of the world.

N

Campus network

SURF network

Rest of the world

Firewall. Protects the networks of institutions against external threats (Perimeter Firewall) and internal threats (Campus Firewall).

SURF Campus Network Access facilitates easy and secure access for people and devices

Seamlessly and reliably connected with each other

Drawing on our vision, we focus on the innovation of network technology, international collaboration and robust security and reliability. This allows us to develop services tailored specifically to institutions. We also share knowledge and expertise to provide the best possible support for education and research.

SURF's network services offer students, lecturers, researchers and staff members access to secure campus networks. Institutions can choose to organise and manage their campus networks themselves or outsource all or part of this to the SURF organisation. SURF offers various service levels to this end, ranging from (mostly) self-managed to fully managed solutions overseen by SURF.

The campus network connects users to the rest of the world via the SURF network. This includes high-bandwidth connections to research facilities through NetherLight, or internet connectivity to the rest of the world. In the area of international connectivity, SURF works closely with other National Research & Education Networks (NRENs) that are similar to SURF to provide access to global research and education facilities.

SURF Campus Network Access

Simple and secure access to institutions' fixed and wireless networks for people and devices through:

➢ *eduroam*, a global standard that gives students, lecturers, staff and guests access to the institutional network (via Visitor Access);
➢ *IoTroam,* which connects IoT devices to the institution's network in a secure and traceable manner.

SURF Campus Network

Future-proof campus network which SURF manages and oversees itself. This is well-integrated with other network services, with SURF assuming the procurement burden:

➢ *Wired*, a wired connection to the campus network.
➢ *Wireless*, Wi-Fi connection to the campus network.
➢ *IoTnet*, wireless connection of low-power sensors and other IoT devices.
➢ *Campus Firewall** protects institutions against internal threats at network level.

* we protect institutions' networks against external and internal threats.

SURF Network

Advanced and protected connectivity via the SURF network:

➢ *Internet*, open and reliable worldwide internet access optimised for education and research, secured in part by SURF CERT.
➢ *Private Connectivity*, shielded communication between institutions within the SURF network, and via NetherLight to third parties.
➢ *Time & Frequency*, transfer of highly accurate time and frequency signals.
➢ *Perimeter Firewall** provides network-level protection against external threats.

NetherLight

An open network node in which national and international education and research partners connect to share large data streams. NetherLight also facilitates shielded connectivity between service providers and institutions connected to the SURF network:

➢ **High Bandwidth Private Connectivity**, shielded, quality connectivity to research and other partners outside the SURF network.
➢ **Cloud Private Connectivity**, shielded connectivity to service providers.

SURF Domain Names

Easy registration and management of internet domains, including DNS resolving, DNS nameserving with DNS management and security options such as DNSSEC.

Security

Creating a safe learning and working environment together

Students, researchers, lecturers and other staff must be able to learn, work and collaborate in an open and secure environment for research and education to thrive. Safety cannot be taken for granted; threats change, technology evolves, and social and societal contexts are in constant flux. Safety and security are critical issues we need to continuously work on together. We protect data, privacy and infrastructure – ultimately ensuring the safety of individuals and institutions.

SURF institutions collaborate on security in four areas:

1. Increasing awareness.

2. Developing and managing solutions to safeguard the security of technology and safety of individuals.

3. Strengthening institutions, including their organisational structure.

4. Facilitating collaboration around security.

In this way, SURF offers a wide range of products and services for institutions to create a safe learning and working environment.

Awareness
SURF institutions develop and share knowledge to increase awareness:

➢ **Centres of expertise** pool and share sharing knowledge about cybersecurity and privacy.
➢ **Cyber Save Yourself**
An awareness campaign that raises awareness of security and privacy issues among staff and students in a playful way.

Technology
Solutions institutions can implement to help users but also institutions themselves to make day-to-day work, learning and research safer.

➢ **SURF Mailfilter** is an effective tool for managing email flows and filtering unwanted email.
➢ **eduVPN** enables secure access to unreliable networks. This way, you always have secure internet access and access to your organisation's shielded systems.
➢ **SURF SOC** monitors cybersecurity threats and potential attacks on institutional infrastructure and shares knowledge with all the institutions connected to SURF.
➢ **SURF CERT** provides 24/7 support for security incidents as well as tools to optimise security
➢ **SURF Certificates** for secure connections between clients and web servers.

Cooperation
Institutions work together in different communities to develop and share knowledge, skills and experience with a view to designing integral security policies for institutions

➢ **SCIRT** is a forum for discussing and analysing the latest cybersecurity threats.
➢ **SCIPR** this community works on improving the maturity level of information security and privacy.

Organisation
Solutions that enable institutions to monitor, evaluate and optimise their security policies and measures.

➢ **OZON/NOZON** practising how to respond to cybersecurity crises.
➢ **SURF Audit** provides insight into governance, risk and compliance and how they are organised.

Other SURF service domains
Security is not an isolated concept but is woven into all of SURF's services and activities, including Procurement (Vendor Compliance) and Identity and Access Management (secureID).
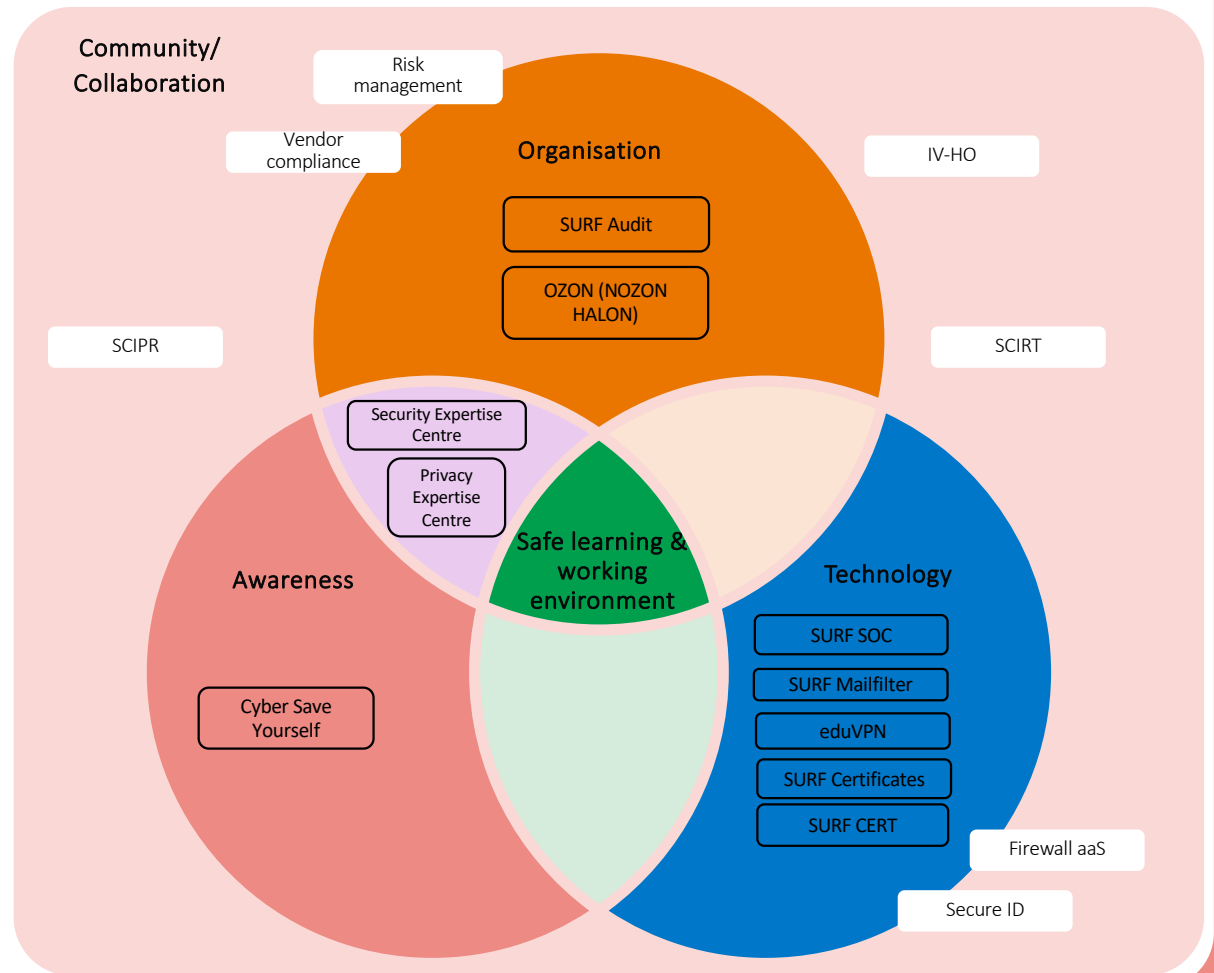
SURF

Creating a safe learning and working environment together

By working together in these four areas, institutions can create a safe and secure learning and working environment for students, researchers, lecturers and other staff members.
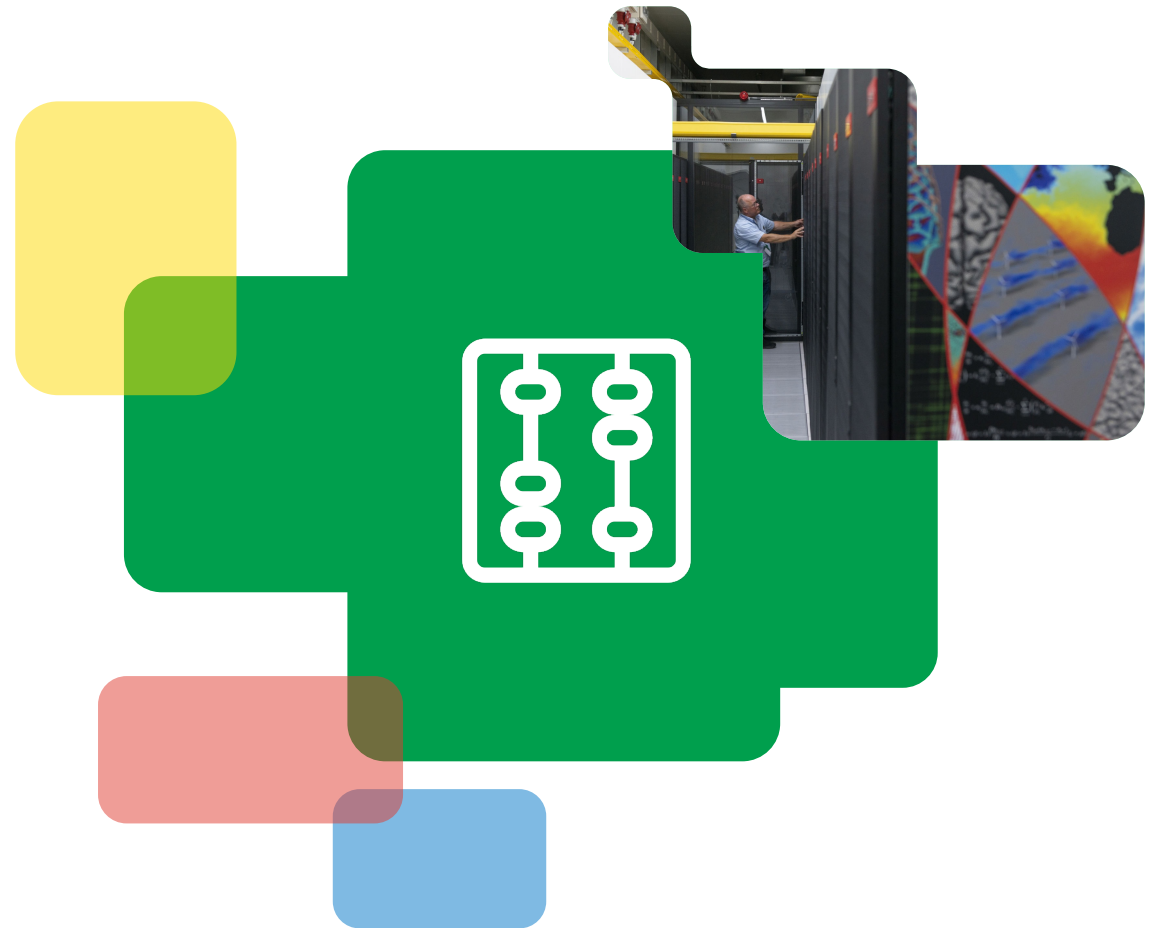
These four pillars reinforce each other. When institutions and users use technology correctly, day-to-day security is safeguarded. Institutions also work together to ensure that technology and behaviour around this technology are up-to-date by jointly monitoring the context of current (and future) use and by testing current policies and measures.

Community/
Collaboration

Risk management

Vendor compliance

IV-HO

Organisation

SURF Audit

OZON (NOZON HALON)

SCIPR

SCIRT

Security Expertise Centre

Privacy Expertise Centre

Safe learning & working environment

Awareness

Technology

Cyber Save Yourself

SURF SOC

SURF Mailfilter

eduVPN

SURF Certificates

SURF CERT

Firewall aaS

Secure ID

SURF

Compute

Large-scale computing power for public advancement

Whether it concerns high-energy physics, climate research or drug development, scientific datasets are becoming increasingly vast and research ever more complex. Large-scale computing power is crucial for generating insights from these datasets

Computing infrastructure supports the generation, processing and analysis of large amounts of data. This benefits research conducted with scientific instruments such as telescopes or satellites. It can also be used to identify, map and better understand the world around us through complex simulations or digital twins.

Computing infrastructure is also increasingly being used to train AI models, such as for applications in healthcare, business and agriculture.

The demand for computing power is virtually limitless, but at the same time there is a growing need for specialist support and barrier-free access. SURF provides researchers in the Netherlands with large-scale computing services that are cost-effective and accessible. Besides raw computing power, we also offer advice and training. Our services can also be used for educational purposes.

Our ambitions for research in the Netherlands:

Delivering **accessible** computing services so that all researchers in the Netherlands can benefit from these services, both now and in the future.

Growing in step with researchers' computing needs, through innovation, so that capacity never limits scientific progress.

Helping researchers harness the power of AI to gain new insights and share them in practical ways.
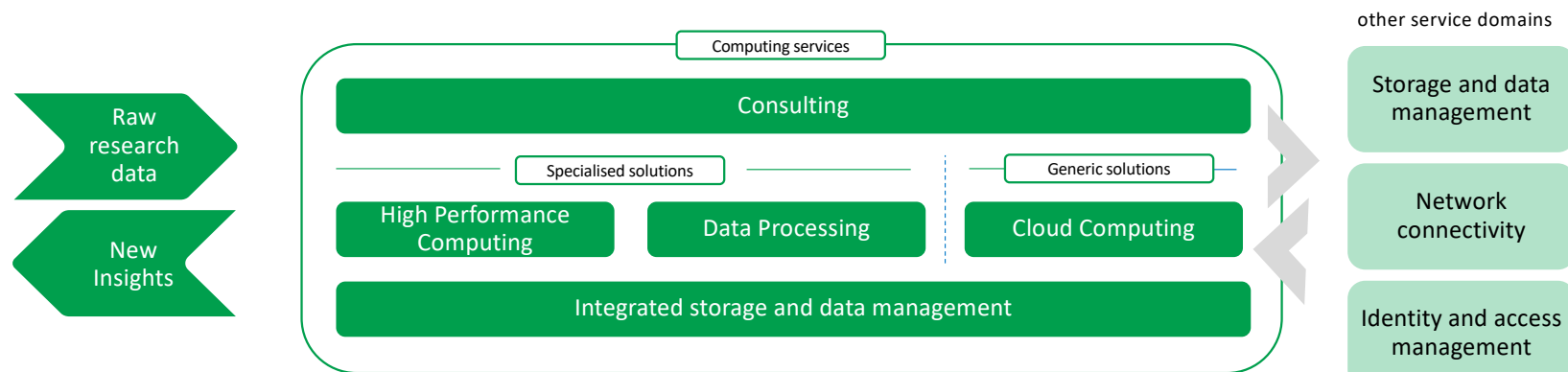
Connecting platforms and projects in the computing landscape so that local, European and commercial can be used optimally.

Assisting researchers with advice on complex topics such as sensitive data, IT architecture or application optimisation.

SURF

Large-scale computing power for public advancement

Computing services

Consulting

Specialised solutions

High Performance Computing

Data Processing

Generic solutions

Cloud Computing

Integrated storage and data management

Raw research data

New Insights

other service domains

Storage and data management

Network connectivity

Identity and access management

High Performance Computing

With the Dutch **Snellius** supercomputer and the European **LUMI** supercomputer at their disposal, researchers can perform large-scale computations. Examples include complex simulations involving interdependent variables or training by means of an AI model. Both supercomputers come equipped with extensive standard configurations and software for various applications.

Computational tasks are executed sequentially, which gives researchers access to immense computing power when they need it.

Data Processing

We also offer **Grid** and **Spider**, our high-throughput computing platforms for processing large datasets such as those generated by scientific instruments.

Grid is part of a federated European infrastructure designed to process the world's largest datasets, while Spider is a local variant that allows for tailored solutions.

Both platforms are typically used for long periods and are an invisible backbone for many scientific instruments.

Cloud Computing

Researchers with modest computing needs who prefer a user-friendly and flexible environment can turn to our cloud services.

Through **SURF Research Cloud**, they can set up environments on SURF's own cloud infrastructure or opt for public cloud providers. This computing and storage capacity can easily be scaled up or down as needed.

SURF's cloud services also offer a rich catalogue of reusable components and tools for handling sensitive data and support 24/7 web applications.

Consulting

In addition to core computing and storage services, we also offer researchers specialist assistance in the areas of **visualisation**, **machine learning**, **High Performance Computing (HPC)**, **High Throughput Computing (HTC)** and **cloud services**.
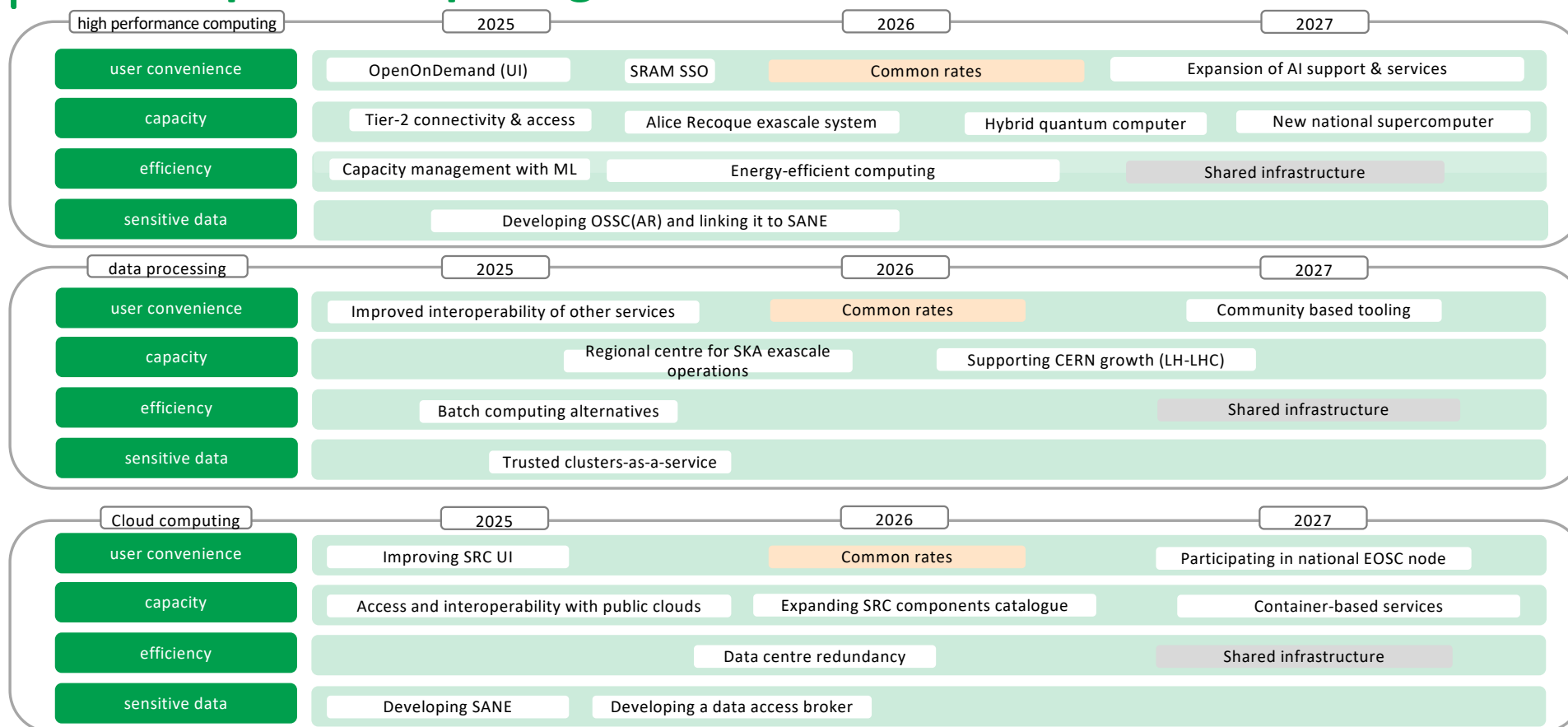
This way, we help researchers by offering advice on how to work on public clouds, how to use AI or how to design solution architecture, for example.

Some of this support is included in our services; additional capacity can be purchased for large projects.

SURF

Roadmap for computing services

high performance computing

	2025	2026	2027
user convenience	OpenOnDemand (UI) · SRAM SSO	Common rates	Expansion of AI support & services
capacity	Tier-2 connectivity & access	Alice Recoque exascale system · Hybrid quantum computer	New national supercomputer
efficiency	Capacity management with ML	Energy-efficient computing	Shared infrastructure
sensitive data	Developing OSSC(AR) and linking it to SANE		

data processing

	2025	2026	2027
user convenience	Improved interoperability of other services	Common rates	Community based tooling
capacity		Regional centre for SKA exascale operations · Supporting CERN growth (LH-LHC)	
efficiency	Batch computing alternatives		Shared infrastructure
sensitive data	Trusted clusters-as-a-service		

Cloud computing

	2025	2026	2027
user convenience	Improving SRC UI	Common rates	Participating in national EOSC node
capacity	Access and interoperability with public clouds	Expanding SRC components catalogue	Container-based services
efficiency		Data centre redundancy	Shared infrastructure
sensitive data	Developing SANE · Developing a data access broker		

SURF

Storage &
data management

Data securely and reliably organised

Data is the fuel that drives research and education. Information and data are foundational for both fundamental and practice-oriented research and contribute to knowledge development, innovation and informed decision-making. Because this is essential to maintain high levels of trust in science, our aim is for our data to be stored, processed and shared reliably – free from unwanted external influences or interference.

Collaboration between researchers is now the standard in modern research. SURF provides solutions for sensitive data and research data management, enabling researchers to organise their data and make it available for reuse. We facilitate this by providing accessible solutions that integrate seamlessly with one another. SURF helps institutions comply with laws and regulations.

In developing our services, we prioritise how researchers work and what they need. We collaborate closely with our members, such as through user groups, to improve our services or develop new solutions. In the spirit of the SURF cooperative, we also encourage and help members to share knowledge and experiences.

Consulting

We assist research teams in finding the right services, and for larger or more complex issues, we conclude contracts.

Storage and data management

We offer multiple services to facilitate collaboration on documents and data, to engage in research data management (RDM) and for reliable, affordable and sustainable storage of large volumes of data.

1. SURF Data Transfer
SURF Filesender allows you to securely send encrypted files, small or large, of up to 1TB. Files are temporarily stored on SURF servers with end-to-end encryption, ensuring that external access is technically impossible.

2. SURF Sync & Share
You can store files in the SURF cloud and collaborate on them any time and anywhere thanks to SURF Sync & Share services. There are two variants of this:
- **SURF Drive**: for personal use (up to 1TB)
- **Research Drive**: designed for research teams and for collaborating with students or beyond the boundaries of the institution. Data from Research Drive can be archived or transferred to repositories after a project is completed.

3. SURF Storage
We provide two solutions for sustainable and affordable storage of large volumes of data:
- **Data Archive**: long-term storage of large datasets using cold storage (tape infrastructure).
- **Object Store**: scalable, flexible storage for various types of data (small to large files and volumes). Object Store supports S3 protocols and serves as a reliable alternative to commercial providers while adhering to SURF principles.

4. SURF Research Data Management
Research Data Management (RDM) involves managing and organising research data throughout the life cycle of that data, from collection and storage to sharing and archiving. Effective RDM enhances accessibility, reusability and sustainability of data, thereby contributing to the reliability and reproducibility of research. SURF offers two RDM solutions:
- **Yoda Hosting**: this is a user-friendly RDM solution with predefined workflows and a web portal.
- **RDM Storage Scaleout**: provides integration with SURF Storage for institutions using their own (iRODS) data management systems.
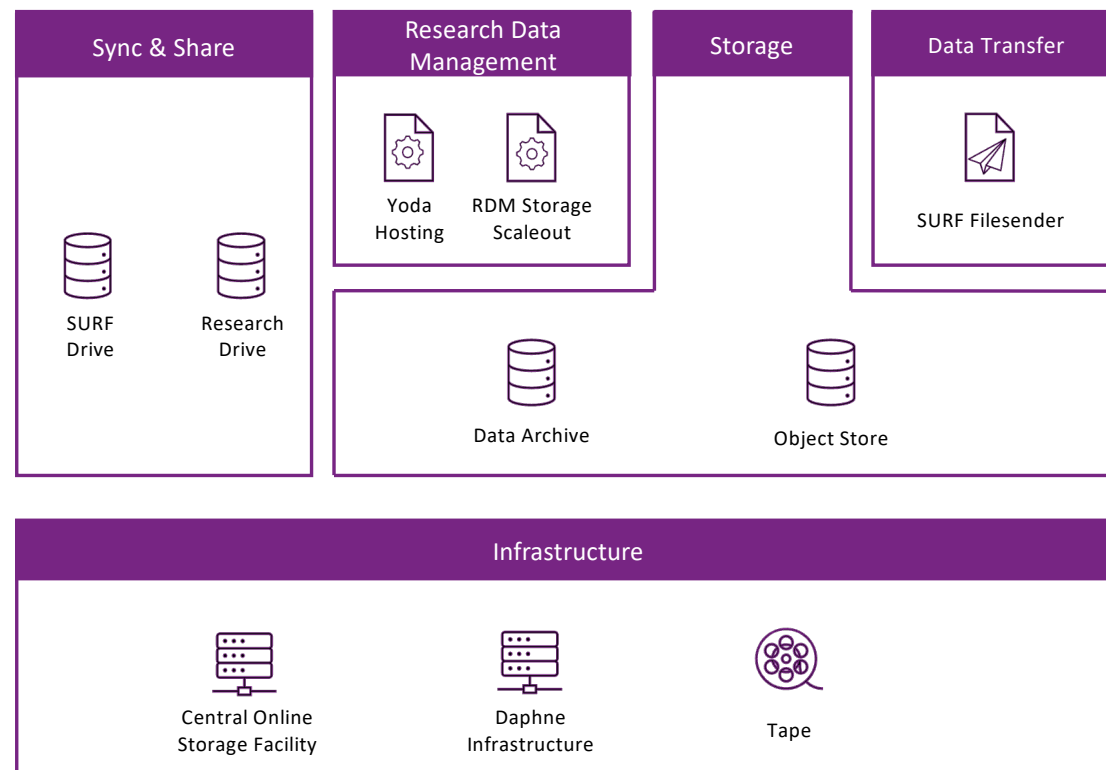
Data securely and reliably organised

SURF's storage and data management services operate on a shared infrastructure which we manage internally. This infrastructure combines cloud storage with tape storage for flexibility in handling small and large volumes of data. Because we are in control, the infrastructure is reliable and delivers the performance required for research data. All SURF data centres are located in the Netherlands.

As datasets grow larger and more requirements are imposed on RDM, users transition from Sync & Share services to other storage solutions and services tailored to RDM needs. These RDM services also allow users to select the underlying storage options.

Data Transfer services allow for easy and secure one-time transfers of data and files.

Sync & Share

SURF Drive

Research Drive

Research Data Management

Yoda Hosting

RDM Storage Scaleout

Storage

Data Archive

Object Store

Data Transfer

SURF Filesender

Infrastructure

Central Online Storage Facility

Daphne Infrastructure

Tape

Publishing

Knowledge circulation as the norm

Knowledge development and innovation is an iterative process that builds on existing knowledge and innovations. It is vital for the socio-economic development of the Netherlands that knowledge can circulate freely in an ethical and organic way. This applies not only within the sector (lecturers, other staff members, students and so on) but also in collaboration with businesses, professional organisations and society as a whole.

In the SURF cooperative, knowledge circulation is boosted through:

- sharing expertise on knowledge circulation;
- developing solutions to facilitate sharing, consulting and reusing knowledge in various forms.

Through our expertise and solutions, we demonstrate the possibilities and benefits of knowledge sharing for different target groups. We help to do this in the right way and under the right conditions.

Expertise

Within SURF, institutions share knowledge on specific themes.
– Information about copyright is available at auteursrechten.nl
– Information about open educational resources (guidance on practical as well as policy & strategy issues) is available at edusources.nl

Source systems

SURF offers solutions for storing knowledge products, metadata creation, publication through various channels but also for integrating existing systems.

- **SURF Sharekit** is a Repository as a Service (RaaS) for sustainable storage of research publications, digital educational resources and students work. These resources can be made publicly accessible or shared within specific groups.
- **SURF Data Repository** Reliable long-term storage for large datasets that ensures accessibility after a research project is completed.
- **iBron** (iSource) allows institutions to manage sharing of knowledge products by linking internal source systems (such as LMS) with third-party applications like plagiarism detection software (ShareControl).
- **Direct integrations** make it possible for institutions to connect their repositories to portals so that knowledge products can be published immediately.

Portals

Knowledge products stored in source systems can be made digitally accessible findable, visible and reusable through one or more portals:

- **Edusources** for open educational resources.
- **Publinova** for practice-oriented research.
- **Knowledge Bank for Universities of Applied Sciences [HBO Kennisbank]** for student work.

SURF Publishing Tools

SURF provides a number of tools to support publication and management of resources. These tools work in conjunction with our solutions but can also be used independently.

- **CopyrightCheck** helps institutions navigate copyright issues related to open educational resources, their own work and copyrighted materials.
- **Persistent Identifiers** (PIDs) ensure that your data remains findable even if its location or infrastructure changes (such as ISBNs for books). Even if the location or underlying infrastructure changes, the reference remains intact. SURF offers the PID service in partnership with the European Persistent Identifier Consortium (ePIC).

Knowledge circulation under institutional management

In a world of dispersed and highly diverse source systems and portals, SURF offers solutions for institutions to store and publish knowledge products securely. By connecting everything, SURF ensures that the content of all repositories is accessible to everyone [or all target groups]. This flexibility allows institutions to set up portals tailored to specific target groups, both within and beyond institutional boundaries, while maintaining control of those portals.

Institutions decide directly or indirectly, through SURF, which knowledge products in their source systems are shared, when and with whom. Additionally, SURF provides researchers, lecturers and support staff with various publishing tools.
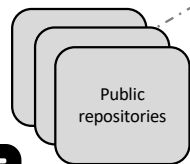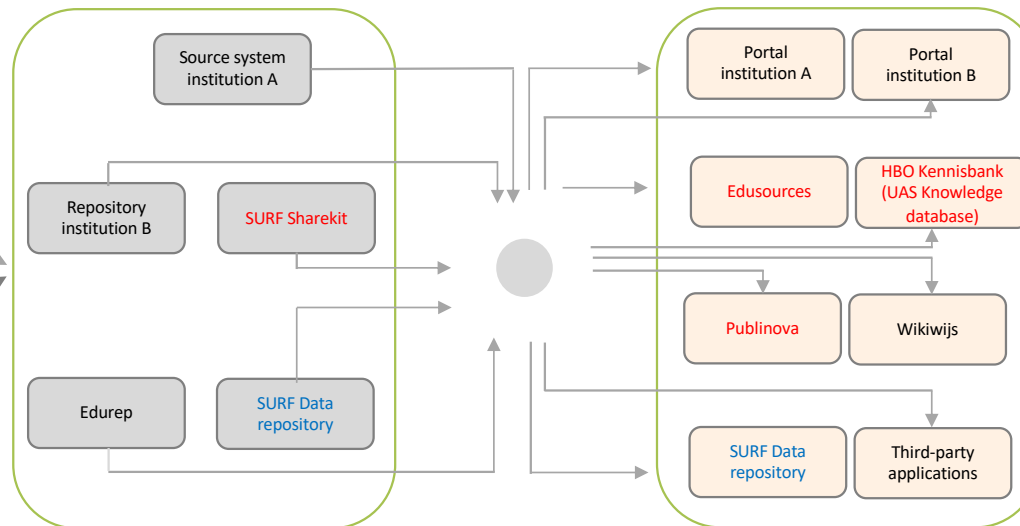
Creators publish

Lecturers, **faculties** and **researchers** develop resources and datasets and publish them in a source system of their choice

Public repositories

SURF

Institutions support and manage the publication process

Source system institution A

Repository institution B

SURF Sharekit

Edurep

SURF Data repository

Portal institution A

Portal institution B

Edusources

HBO Kennisbank (UAS Knowledge database)

Publinova

Wikiwijs

SURF Data repository

Third-party applications

Users search

Lecturers search and use knowledge products for their courses via their institution's portal or other portals

Researchers search and use knowledge products for their own research

Students search and use knowledge products or other dissertations for their own research

Businesses, professional organisations and society at large

Knowledge circulation under institutional management

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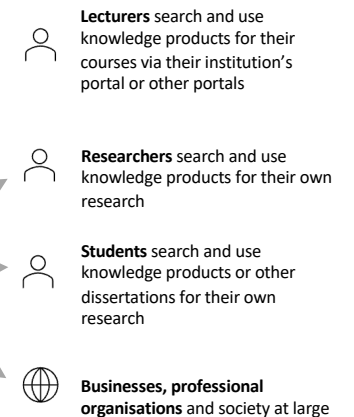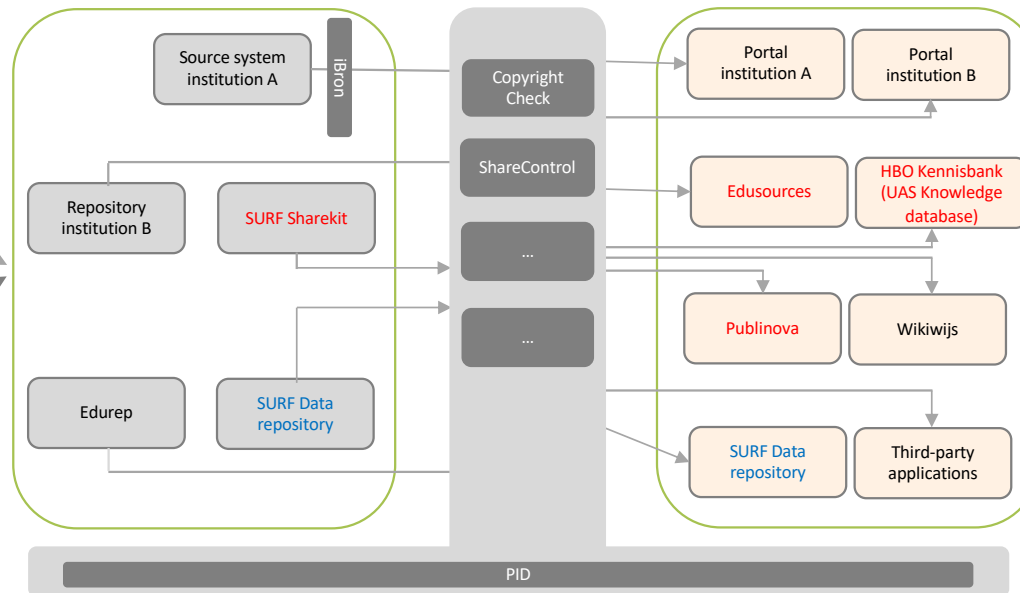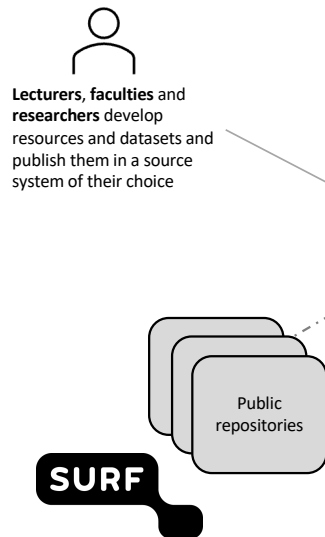
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Public repositories

SURF

Source system institution A

iBron

Repository institution B

SURF Sharekit

Edurep

SURF Data repository

Copyright Check

ShareControl

...

...

Portal institution A

Portal institution B

Edusources

HBO Kennisbank (UAS Knowledge database)

Publinova

Wikiwijs

SURF Data repository

Third-party applications

PID

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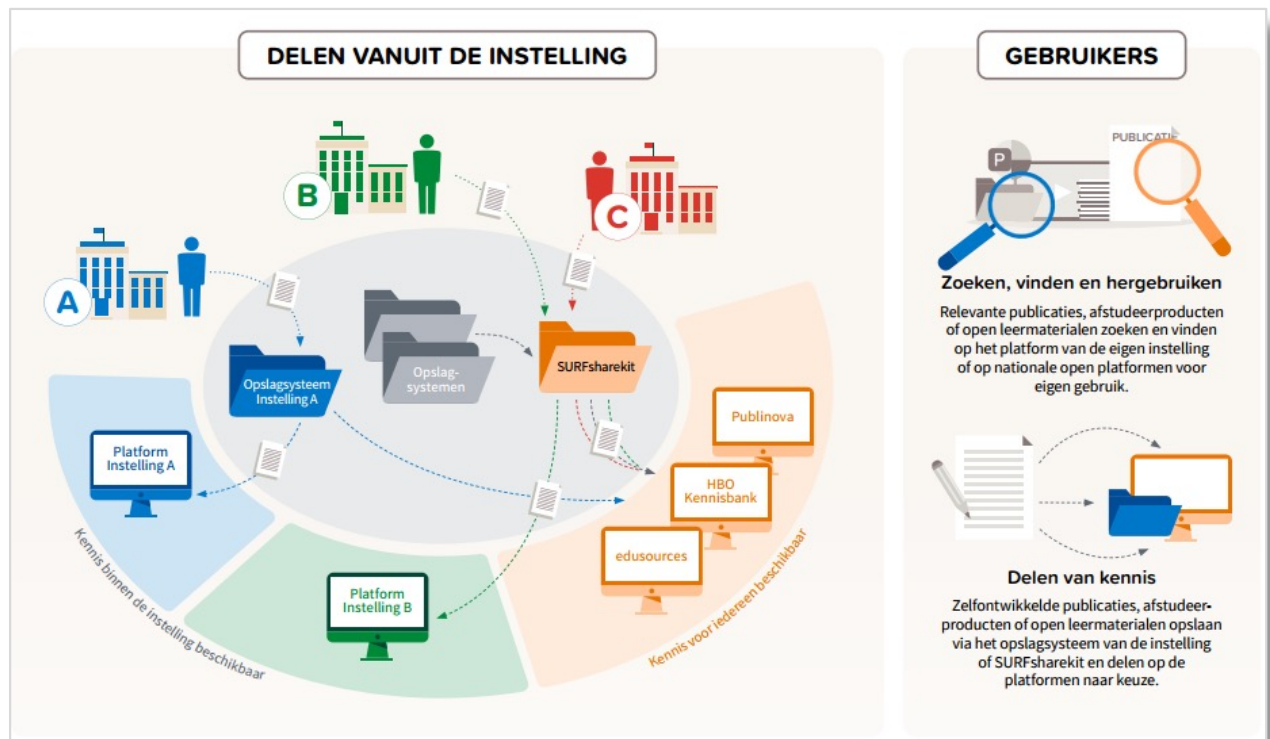
Businesses, professional organisations and society at large

Publishing

In collaboration with educational institutions, SURF promotes knowledge circulation by developing and managing solutions that facilitate sharing and reusing knowledge. In a network of diverse storage systems and platforms of institutions and other content providers, SURF connects everything logically. Institutions decide themselves how to share documents for their target groups, such as only within their own institution or more broadly at the national level.

DELEN VANUIT DE INSTELLING

Opslagsysteem Instelling A
Opslag-systemen
SURFsharekit
Platform Instelling A
Platform Instelling B
Publinova
HBO Kennisbank
edusources

Kennis binnen de instelling beschikbaar
Kennis voor iedereen beschikbaar

GEBRUIKERS

Zoeken, vinden en hergebruiken
Relevante publicaties, afstudeerproducten of open leermaterialen zoeken en vinden op het platform van de eigen instelling of op nationale open platformen voor eigen gebruik.

Delen van kennis
Zelfontwikkelde publicaties, afstudeer-producten of open leermaterialen opslaan via het opslagsysteem van de instelling of SURFsharekit en delen op de platformen naar keuze.
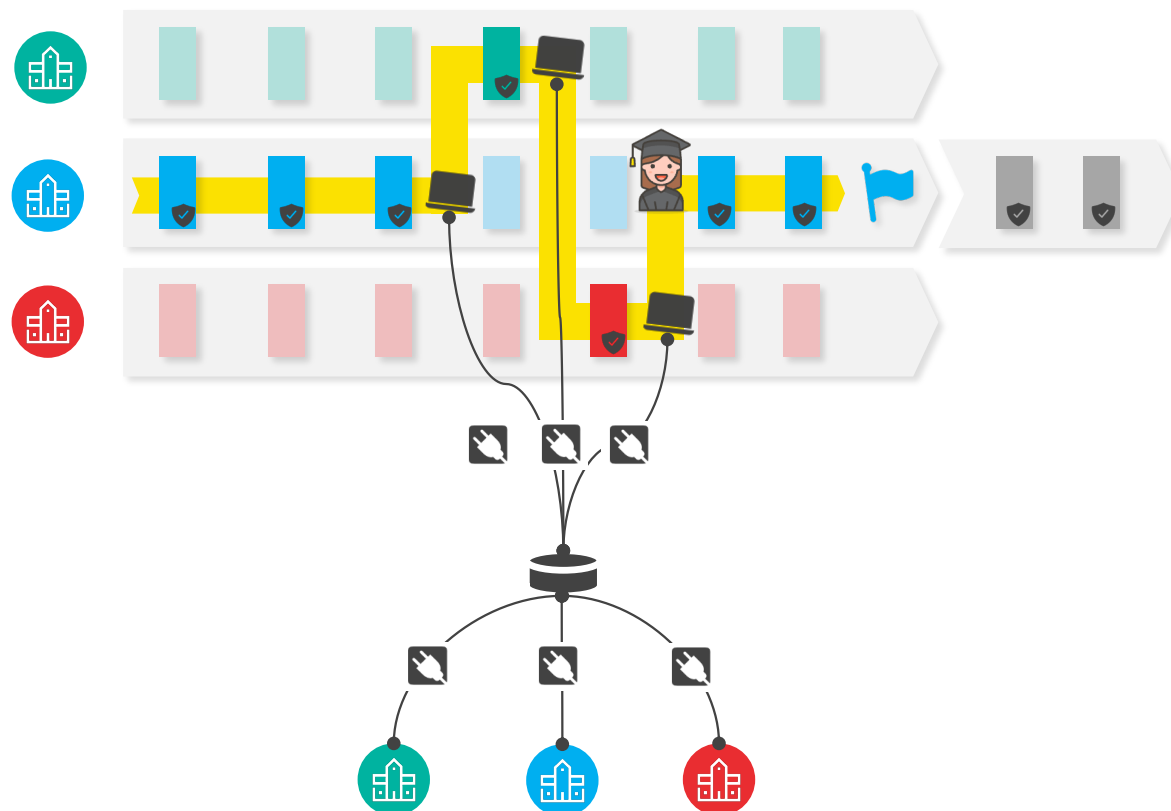
Flexible education

Enhancing the flexibility of education

The demand for greater flexibility in personalised learning pathways – both within and beyond institutions – requires a transformation of the education system. This includes collaborative efforts and interoperability between systems and organisations to enable barrier-free collaboration and information sharing. SURF supports this transformation by working on an education ecosystem where interoperability is key to enhancing learner agility.

Institutions work together to build this more agile education ecosystem. To this end, SURF develops applications, platforms and universal (and international) standards such as APIs.

Kies op Maat eduXchange	Solution for orientation on and enrolment in course offerings
edubadges	Platform for digital certificates in Dutch education
eduhub	Data hub for course offerings
OOAPI	Open Education API for course offerings

Enhancing the flexibility of education

In the SURF cooperative, institutions collaborate on technical building blocks for this agile education ecosystem with the purpose of offering learners more flexibility when designing their personalised learning pathways. This includes developing solutions to:

1. Make data about course offerings accessible.
2. Enable learners to explore a wide range of course options (e.g., modules or minors) and enrol in them, and enable institutions to provide feedback on achieved results.
3. Help learners collect and share their results and experiences digitally.

Data sharing

SURF develops standards and platforms to facilitate data sharing between institutions and third parties, including commercial entities This fosters cooperation and improves interoperability between systems and institutions.

➢ **OOAPI**: the Open Education API is an open standard for sharing education data. This API allows educational institutions to share information, such data on course offerings, grades and timetables.
➢ **eduhub**: this is a data hub that enables institutions to make data about their educational offerings accessible to each other, such as information about courses or programmes.

Orientation and enrolment

Solutions that allow learners to explore a wide range of course offerings provided by their own institutions and other institutions and enrol in these courses.

➢ **Kies op Maat**: through the Kies op Maat platform, learners can explore and enrol in courses – mainly minors – offered by 29 participating universities of applied sciences and research universities. This makes studying outside one's own institution easier, is often free of charge and gives learners more agency over their studies.
➢ **EduXchange** is a service that is still in the pilot phase. EduXchange allows learners to explore and enrol in cross-institutional courses while ensuring that achieved results are reported back to their own institution. This platform uses OOAPI, eduhub, and eduID.

Making results visible

SURF provides solutions for learners to collect and share their results and experiences:

➢ **Edubadges** is SURF's platform for easily verifiable digital certificates, including microcredentials, tailored to Dutch education. An edubadge offers learners a secure and reliable way to demonstrate their acquired knowledge and skills.
Edubadges can be easily shared with other educational institutions or employers.
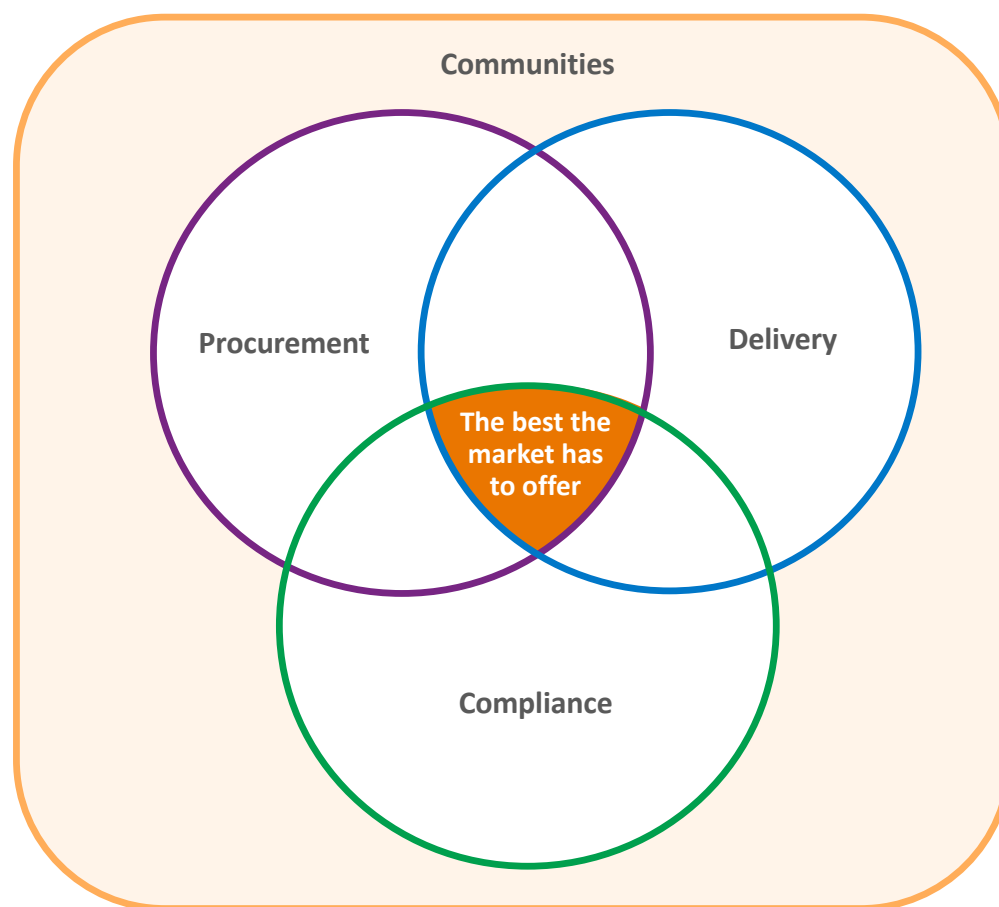
Procurement and delivery

Getting the best the market has to offer

In the SURF cooperative, members work together to secure the best market terms and conditions for IT services and content to optimise their use in education and research.

The procurement and distribution service domain combines four key competencies to achieve the best outcomes for the sector: Together, these competencies create a strong and independent position in the market. Through SURF, members set up a joint market strategy and work together to:

1. Gain a stronger position and scale to negotiate favourable agreements with the market.

2. Ensure that purchased services are effectively implemented, used and delivered to the right users.

3. Perform overarching privacy and security risk assessments of suppliers and applications to ensure compliance with laws and regulations.

4. Share expertise with each other so that we strengthen each other's knowledge of procurement and application possibilities of IT services on the market.

SURF

Communities

Procurement

Delivery

The best the market has to offer

Compliance

Getting the best the market has to offer

Cooperation of members in IT procurement and distribution

In the SURF cooperative, members collaborate on IT services and innovations to enable high-quality, flexible education and research. Over two million students and staff benefit from these services daily.

Members want access to the best IT services and products and work together to achieve this by consolidating their needs, requirements and demands in SURF. Through SURF, they jointly engage with the market, procure services and collaborate on implementing these services.

By pooling resources through SURF, members have a stronger position to negotiate favourable terms with global IT providers, startups and innovative EdTech companies. This concerns agreements on functionality, price, interoperability, sustainability, privacy and security. Cost savings are achieved by negotiating favourable terms of use and price advantages. SURF members endorse public values in which the sector's sovereignty is safeguarded and, through SURF procurement processes, translate these into competitive contract terms.

Suppliers also benefit from this approach as they have a single point of contact to deliver tailored offerings to over two million users in education and research.

Procurement

SURF pools members' procurement needs and makes contractual agreements with suppliers on their behalf.

➢ IT procurement
  Joint procurement of software, hardware and IT services.
➢ Content procurement
  Joint procurement of journals and databases.

In addition, SURF handles contract and supplier management, provides transaction and journal data and performs analyses.

Delivery

SURF supports and advises members and suppliers in the procurement, delivery and application of the vendor portfolio. There are multiple delivery channels:

➢ Mijn SURF
  The customer portal with the vendor portfolio and SURF services.
➢ SURF Cumulus
  The delivery channel for cloud services to institutions, with tailored advice on best-use cases.
➢ SURF Spot
  The delivery channel for students and staff.

Compliance

SURF performs overarching privacy and security risk assessments on vendors and their applications. SURF makes privacy and security contractual agreements with suppliers for the entire sector if necessary. This gives institutions the tools they need to make their own considerations for secure deployment of assessed applications in their institutions.

Community

SURF members share knowledge and experiences about the IT market, procurement and application possibilities – including through expert communities:

➢ SURF Cloud Expertise Centre
  For proper application of cloud technology.
➢ SURF Taskforce Beyond Privacy Shield
  For secure data sharing.

SURF