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Milestone M5.4 (M42)
Review and Updates of Service Roadmaps

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Abstract
The Trust and Identity Work Package (WP5) is responsible for delivering services from the T&I portfolio, including for their operations, support and further development. This milestone presents an update of the Trust & Identity service roadmaps published in M5.2, focusing on the plans for service development and enhancement for the timeframe of 2020/2021.

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Executive Summary

This milestone defines committed and aspirational goals for the operations and deployment, enhancement and development roadmaps of the T&I services delivered via the GN4-3 project's Work Package 5, for the years 2020 and 2021. The roadmaps are defined for a period of up to two years; the roadmaps take into account inputs from the wider stakeholder community, particularly as concerns enhancements and new features. These roadmaps are subject to continual review and updates, especially of aspirational goals. This milestone document is the update of the service roadmaps first published for the years 2019 and 2020 as Milestone M5.2. During the progress of the GN4-3 project, one more snapshot of the roadmap will be published in the subsequent Milestone report. Further stakeholder consultations will take place to update roadmaps for the project period after 2021. These roadmaps will be adapted for their use by the Partner Relations, Outreach and Business Development team in Task 4 of this work package, to ensure the appropriate message about the service plans is conveyed to the stakeholder community.

1 Introduction

The Trust and Identity Work Package (WP5) is responsible for the innovation and development of T&I services, their operations and support, as well as for driving T&I services towards the anticipated maturity levels. From an operational perspective, WP5 ensures that T&I services in production are operated efficiently and securely, reach the required availability and quality levels, with relevant procedures and documentation in place, and provide the appropriate level of support. Services operations and support are performed as daily activities, following an agile approach when it comes to implementing improvements to processes and resources employed. The development of new features or major enhancements to services is performed according to the requirements gathered from the stakeholders, and plans are based on the available resources and prioritisation.

Services that are currently in the T&I portfolio are: eduroam, eduGAIN and federation services, eduTEAMS, and InAcademia. Each service has an appointed service owner, who is responsible and accountable for the delivery of the service as a whole and for defining the service roadmaps. Service teams are internally organised to deliver operations, development and support functions for the services. For the new eduTEAMS and InAcademia services, an agile approach is followed. This implies short sprints to frequently release software enhancements that address stakeholders' requirements. The agile approach also requires a tighter integration between development, operation (hence the involvement of the DevOps team) and support teams. For eduGAIN and eduroam, operational and development teams work closely together to use their full potential to ensure smooth transition and continuous integration (development) for further service enhancement and deployment of new features.

This document summarises the roadmaps for T&I services for 2020/2021 and provides an update to the roadmaps for 2019/2020. The purpose of these roadmaps is to define the timeline of further development and enhancement of the T&I services. They contain both committed and aspirational goals, and their content will be subject to ongoing evaluation and updates, based on the progress made and available resources.

During the course of the project, periodic consultations with the stakeholder communities are held in order to further inform and provide input for the roadmaps. Although, due to COVID-19 restrictions, all face-to-face T&I planned events in 2020 were cancelled, regular consultations and information sharing sessions were held with services stakeholders and governance committees and these were taken into consideration when devising future plans. A further update to these roadmaps will be produced as milestone M5.5 Review and Updates of Service Roadmaps (2), which is due November 2021.

Complementary to these service roadmaps, Task 2 (Incubator) in this work package is tasked to explore new ideas or potentially disruptive T&I technologies that are considered sufficiently mature within the project TRL constraints. The Incubator is operating within predefined development cycles, after each of which the results of individual activities may be used by the service teams, therefore providing

another input for the service roadmaps. The methodology and plans for the work of the Incubator in Task 2 were published in Milestone *M5.3 Incubator Methodology and Plans* and the incubator results for the first period of the project will be published in Deliverable D5.2.

Through the work of this work package, the GN4-3 project participates in and follows other global initiatives in the domain of Trust and Identity, including:

- SeamlessAccess project, aimed at optimising protocols across key stakeholder groups, with the goal of facilitating a seamless user experience for consumers of scientific communication. GÉANT participates in the Coalition for Seamless Access, together with other organisations such as STM [STM] and NISO [NISO], by providing operational capabilities.

- Projects that expand the reach of eduGAIN to support student mobility use cases as well as to enable the usage of eIDAS, such as MyAcademicID. These activities are carried out in close liaison with WP5 key people and their results will inform the development of eduGAIN beyond 2021.

- Key members of WP5 participate in several other relevant initiatives and projects (EOSC-Hub technical committee and the EOSC-Hub architecture work package, WISE community, REFEDS, IGTF) and report back to WP5 via the enabling community task (WP5 Task 4) to ensure ongoing liaison and collaboration with these bodies.

- With the end of the AARC2 project, WP5 will continue to support some of the work to maintain and update the AARC architecture and policy results and participate in the AEGIS group that brings together international e-infrastructures that implement the AARC BPA.

The following sections provide a summary of the T&I services delivered by Work Package 5, followed by the service roadmaps.

2   eduroam

Service Owner: Miroslav Milinović (SRCE/CARNET)

eduroam is a worldwide roaming access service for the international research and education community. GÉANT coordinates eduroam's worldwide operations, operates the European core infrastructure and a number of supporting services for global use, and provides the relevant support. These services include:

- European Top-Level Radius servers in the Netherlands and Denmark
- Monitoring, Diagnostics and Metering tools [Monitor]
- Database [DB]
- Configuration Assistant Tool [CAT]
- Managed eduroam IdP service [Host]

GÉANT also works on the further development and enhancement of eduroam with the objective of increasing ease of deployment for institutions and national roaming operators (NROs), improving user experience for end users, and ensuring that the quality of eduroam national deployments is as prescribed in the eduroam service definition.

The 2020/2021 roadmap for eduroam **operations, support and deployment of enhancements** for the GN4-3 project focuses on the following areas:

- **eduroam Database Version 2.0**

  The eduroam database is a key element of the supporting infrastructure. It serves as the central, authoritative collection of data about the institutions (NROs, service providers (SPs) and identity providers (IdPs) participating in the eduroam service. It provides input to other services such as CAT and eduroam Managed IdP [eduManIdP], and is the source of data for building the eduroam service locations map, etc. Version 2.0 of the database specification implements various improvements and brings novelties such as the ability to mark areas covered by eduroam's wireless signal.

  Migration from the current eduroam db to v2.0 was finished in Q1 2020. Aligning of the eduroam supporting tooling is dependent on NROs completing the adoption of the new database format and is expected to be completed during 2020. Following this, maintenance of the eduroam database v2.0 will become part of continuous operations activities.

- **eduroam Audit**

  With eduroam now being provided in more than 100 countries by thousands of IdPs and SPs, the time is right to introduce an auditing system to regularly check if participating organisations are following eduroam policies and recommendations. The audit system will promote those who are implementing eduroam according to the current best practices, and at the same time,

warn those who are providing a substandard level of service. The eduroam audit will be developed as a combination of manual and automatic tests, partially run by the eduroam operations team and partially as self-service assessment that will enable participating organisations to evaluate their deployments against the policies and best practices.

Drafting of the audit procedure is ongoing in 2020, with a plan to pilot it with the European NRENs and based on this to get approval for the procedure by the eduroam Steering Group (SG) and Global eduroam Governance Committee (GeGC). This procedure will then be used to perform the first round of audits, supporting NROs to step up to the eduroam baseline.

- **eduroam Policy Update**

   The eduroam service definition and policy are defined by the documents originally drawn up in 2008. The last review of these documents was in 2012, and since then there have been changes in both technology and organisational aspects that require them to be updated again.

   A consultation with the eduroam Steering Group (SG) will be held to prepare the final version of the policy after which signing of the new policy will be arranged.

- **Continuous Operations, Deployment of Enhancements, Support and Engagement**

   The eduroam team will continue to operate eduroam core and supporting services, manage NRO membership for Europe and provide global support via official support channels. It will work on enhancing operational processes and resources in an agile manner. eduroam db v 2.0 and redesign of the certificate provisioning will move to continuous operations. Work to support new NROs to join the eduroam service will continue in collaboration with the GÉANT partner relations, global outreach and business development teams. GÉANT Learning and Development Team (GLAD), in collaboration with the eduroam team which will provide its specific expertise, will support the community by delivering eduroam training and learning materials on request. Engagement with NROs, the wider community and standardisation bodies will continue via participation in the European Confederation eduroam Steering Group (SG) and Global eduroam Governance Committee (GeGC) and through contribution to global standards and/or R&E community profiles.

The roadmap for eduroam **development** for the first two years of the GN4-3 project focuses on the following areas:

- **eduroam Managed Service Provider (SP)**

   eduroam Managed SP is being developed with the goal of doing away with the complexity of operating an eduroam RADIUS server for Service Providers. eduroam Managed SP is a multi-level, multi-tenant system operated by the eduroam operations team. It allows the creation of an eduroam SP without the deployer requiring any knowledge of the eduroam architecture.

   During 2019, a technical proof of concept was developed in ongoing consultation with the eduroam NROs. During 2020/2021, it is planned to prepare for the PLM approved pilot, run the pilot and, based on the results, prepare for service transition.

- **Open Roaming**

   Open roaming is an industry initiative that embraces the Wi-Fi federation concept pioneered by eduroam. In 2020, GÉANT joined the Wireless Broadband Alliance (WBA) that is running this initiative to influence developments and assure that these are compatible with eduroam.

Industry implementation of open roaming would allow eduroam to interfederate with other Wi-Fi providers, expanding the footprint of eduroam to cover locations that are not strictly related to R&E institutions.

In 2020/2021, it is planned to carry out initial design and testing to enable eduroam interoperability with open roaming, and to run the trials with interested NROs. Future plans will be defined based on the trial results.

- **Certificate Provisioning Redesign**

  The current eduPKI certificate provisioning that is used to enable RadSec deployments has proven to be a heavy and unscalable solution for the global eduroam community. The WP5 team aims to redesign the process so that it will provide a simple click-through browser experience to issue certificates. It will also action semi-automated eligibility checks, exploiting data structures of the official eduroam database, and issue certificates in near-real-time using eduPKI SOAP API.

  In 2019, the new system was designed and achieved its proof of concept. In 2020/2021, it is planned to further test the new system and, once it is proved to be stable, deploy it as a part of the eduroam supporting services suite. Following this, this activity will move to maintenance as part of continuous operations.

- **eduroam Diagnostics**

  The main goal of this activity is to bring the monitoring and diagnostics tools as close to the end-user experience as possible. The team combines the data acquired via the eduroam database, current monitoring and measurement services with other supporting tools, such as CAT. This is complemented by the design and development of monitoring probes that verify the health of the eduroam service at individual service locations.

  In 2019, a prototype was developed adding features to improve communication with users. During 2020/2021 it is planned to integrate hardware probes with eduroam supporting tools. Based on the results of this integration, further plans will be defined.

- **Radsecproxy Development**

  Radsecproxy is a generic RADIUS proxy that supports TLS (RadSec) RADIUS transport. Radsecproxy is used by NROs and Identity Providers that want to introduce RadSec capability on top of their existing RADIUS infrastructure, increasing security and efficiency for transport of RADIUS traffic.

  The Roadmap for 2020/2021 was prioritised to complete two minor releases that are targeting the features requested by the user community, after a major release that will introduce load balancing and pooling features.

- **Continuous Service Improvements**

  eduroam supporting services use solutions developed in-house. These require maintenance through continuous development and enhancement to the tooling and software, which will be delivered in an agile manner.

The timeline for the eduroam roadmap is available online [Roadmap].

3   eduGAIN and Federation Services

Service Owner: Davide Vaghetti (GAAR)

eduGAIN is one of GÉANT's key Trust and Identity services, allowing trusted digital identities to be used to securely access available web resources. GÉANT operates a number of core and supporting, global-level services, and also provides the relevant support. These services include:

- Metadata Service [MDS]
- Metadata Validator [Validator]
- Technical site, including various tools and status information [Tech]
- Entities database [Entities]

- **Federation as a Service (FaaS)**

GÉANT also works on the further development and enhancement of eduGAIN with the objective of improving ease of deployment for institutions and identity federations, enhancing user experience and ensuring that identity federations are operating in accordance with the defined eduGAIN profiles and best practices. This work also scales the service for future demands in terms of quality, usability, security and growth.

The 2020/2021 roadmap for eduGAIN **operations, support and deployment of enhancements** for the GN4-3 project focuses on the following areas:

- **eduGAIN Operations**

  In 2019, the certificate in the eduGAIN signing key was replaced as a short-term strategy to address its expiration. Following this, a team comprising the eduGAIN Service Owner, the eduGAIN-OT and subject experts from the R&E community was established and a long-term strategy to improve the eduGAIN metadata signing key and process defined.

  In 2020/2021 it is planned to finalise this plan and to implement the new signing process and key. After this, this activity will no longer be part of the roadmap and will move to continuous operations.

- **eduGAIN Support**

  eduGAIN support serves enquiries that are addressed to support@edugain.org. To monitor compliance with the eduGAIN profiles, support also works in a proactive manner, reacting to errors and warnings that are identified by various eduGAIN checking tools.

  In 2019 and 2020, the eduGAIN support team has gradually widened the scope of its proactive support by adding other eduGAIN checking tools and services (such as eduGAIN Connectivity Check and the eduGAIN Code of Conduct), and react to errors and warnings following processes that still need to be defined. In 2020/2021, eduGAIN support continues to improve documentation by providing public-facing support documentation. This activity will move into the continuous delivery and improvement of support function.

- **eduGAIN Security**

  In 2019, the eduGAIN security team was created, alongside with its contact and secure channel of communication. The role of this team is to provide a central point of contact and coordination when addressing inter-federation security incidents, and to act in a proactive manner to address security threats.

  In 2020/2021, the eduGAIN security incident response handbook will be created in collaboration with the REFEDS SIRTFI working group. The consultation with the eduGAIN community is planned for the second half of 2020. Once the handbook has been finalised, it is planned to start engagement with Identity federations in order to collect security contacts and build the eduGAIN security community.

- **eduGAIN Training**

  At the end of 2019, the partner relations and eduGAIN teams received a request for training for ASREN covering 22 NRENs in the Arab region. As there is a request to deliver training for the east Europe region, this is mandated to create a dedicated activity to create and deliver eduGAIN training.

  In 2020/2021 it is planned to bootstrap the training activity by creating a dedicated team and establishing a close collaboration with the GÉANT Learning and Development team (GLAD). This team will work on creating eduGAIN training modules and will be prepared to deliver these on a request basis, starting with the training for ASREN.

- **Continuous Operations, Support and Deployment of Enhancements, Support and Engagement**

  The eduGAIN team will continue to operate eduGAIN core and supporting services as well as FaaS, manage identity federation membership of eduGAIN and provide support via an official support channel. It will work on enhancing operational processes and resources in an agile manner. Work on supporting new identity federations to join the eduGAIN service will continue in collaboration with the eduGAIN secretariat and the GÉANT partner relations, global outreach and business development teams.

  Engagement with identity federations and the wider community will be continued via participation in the eduGAIN Steering Group (SG) and the activities of REFEDS, AEGIS, FIM4L, FIM4R, CACTI, etc. More specifically, the eduGAIN service will collaborate with the REFEDS working groups to maintain and develop all the policy frameworks relevant to eduGAIN, such as the GÉANT Code of Conduct Version 2 (this will also cover the investigation to establish a monitoring body as required by GDPR Article 41), the Research and Scholarship Entity Category and Sirtfi. The eduGAIN service will also engage with the OpenID Connect community through participation in the activities of the OIDF Research and Education working group.

The 2020/2021 roadmap for eduGAIN **development** for the GN4-3 project focuses on the following areas:

- **F-ticks for eduGAIN**

  Authentication statistics and measurements enabled via the eduGAIN interfederation provide important metrics for quantifying and understanding the service's usage and patterns. This is necessary to fully comprehend eduGAIN's value and drive further improvements.

  In 2019 and early in 2020, technical work was completed by implementing the final data collection setup and visualisation using an off-the-shelf platform and defining the adoption

plan. During the remainder of 2020/2021 it is planned to run the service based on the adoption plan, and to evaluate the results in order to determine future actions. This will include generating a more generic strategy for consolidating eduGAIN monitoring and metering tools.

- **StatRep**

    In the second incubator cycle, (Task 2) which was finalised in 2020, the idea of creating an eduGAIN status reporting dashboard showing the adoption of various eduGAIN features by Identity Federations and participating entities, was explored. The results of the incubator show that introducing such a tool would be of great value to help raise the quality of eduGAIN.

    In 2020/2021 it is planned to establish a close collaboration of eduGAIN team and the third incubator cycle that shall result in a tool that is ready to be introduced in the eduGAIN support tool set. Following this, a more generic strategy of consolidating eduGAIN monitoring and metering tools (including F-ticks) will be introduced.

- **Campus IdP Toolkit**

    Campus IdP Toolkit eases the burden of deploying technical infrastructure for IdPs, by offering a packaged solution for easy deployment of Shibboleth Identity Provider. In 2019 and early in 2020, this software solution was finalised and published at https://github.com/GEANT/ansible-shibboleth. During the remainder of 2020/2021, this work will be moved into the continuous maintenance phase and the expectation is that the community using the tool will contribute to it.

- **PushMDQ**

    The **c**urrent eduGAIN metadata distribution solution provides a stable and reliable way to distribute metadata. However, this solution relies on pre-defined regular intervals for collecting and redistributing metadata feeds, with the consequence that propagating changes in metadata are not instantaneous. In the second incubator cycle, the idea of pushing metadata changes was explored and a technical proof of concept was delivered. The results gained great traction and interest in the eduGAIN community. In 2020/2021, plans are to transition the results to the eduGAIN-OT which will prepare a testbed deployment of this solution and engage with federation operators for testing.

- **Continuous Service Improvements**

    eduGAIN technical site and checking tools use solutions developed in-house. These require maintenance through continuous development, and enhancements to the tooling and software, which will be delivered in an agile manner. Moreover, some of the checks that are performed will be updated according to the specification or the policy to which they relate, such as the GÉANT Data Protection Code of Conduct (CoCo) v1 monitoring tool, which will be updated once version 2 of the CoCo is issued.

The timeline for the eduGAIN roadmap is available online [Roadmap].

Over the course of the next two years, additional items may be added to the roadmap, based on the available resources in the eduGAIN team. Such items may include input from the Incubator task and from REFEDS, such as the service catalogue for the interfederation context, etc.

4 eduTEAMS

Service Owner: Christos Kanellopoulos (GÉANT Association)

The eduTEAMS service enables research and education communities to securely access and share common resources and services. Leveraging the ubiquitous presence of eduGAIN federated identities, eduTEAMS enables communities to securely authenticate and identify their users, organise them in groups, assign them roles and centrally manage access rights for using community resources. As research is not confined to research institutes and universities, eduTEAMS also caters for users coming from the industry or citizen scientists who may not have access to eduGAIN. eduTEAMS is a TRL9 service.

At the beginning of the GN4-3 project, eduTEAMS was still a new service, therefore work has focused on ensuring the service's adoption by the R&E communities. In 2019, this yielded great results with eduTEAMS uptake skyrocketing within research communities. The technical development of the eduTEAMS service is driven by the priorities of the early adopter communities, and is done in an agile manner, following ongoing updates of the technical development roadmap.

The roadmap for eduTEAMS for 2020/2021 focuses on the following areas:

- **Service adoption and Business Development**

    Continue the work with various R&E communities who are adopting eduTEAMS. At the time of writing, eduTEAMS works with a number of research communities, including: Life Sciences (EOSC-Life), Photon and Neutron Community (PaNOSC/UmbrellaID), Earth Sciences (NextGEOSS), EUROFusion and SSHOC, as well as with SURF on their Research Access Management platform, which is the first national deployment for eduTEAMS. The plan is to continue active engagement with these R&E communities and support them in using eduTEAMS offerings.

- **Technical Development**

    It is planned to continue the development of new features, such as the trials of the step-up authentication service, introduction of thiss.io software for IdP discovery service, integration with ORCID API, introduction of a new OIDC front-end with support for local and remote token introspection and token exchange support for the AARC community guidelines (specifically AARC-G021 "Exchange of specific assurance information between Infrastructure" and AARC-G031 "Guidelines for evaluating the combined assurance of linked identities"), as well as support to services that require certificate-based authentication. Since eduTEAMS employs an agile approach to development, the development roadmap is also frequently updated, which is why it is available to the public at [eduTEAMS_roadmap].

- **Continuous Operations and Support**

    Operate the service and provide support on a daily basis. The plan is to scale up the operational team and resources so that they are fit to operate and deploy new eduTEAMS instances for dedicated and bespoke service offerings.

5 InAcademia

InAcademia is a service that allows online retailers and other SPs not connected to an identity federation and eduGAIN the means to easily validate if a customer is a student or is affiliated to an educational institute in another way. For user authentication, InAcademia uses the Identity Providers available in eduGAIN. At the beginning of the GN4-3 project, InAcademia had already passed the technical pilot and reached TLR8. In 2019 the service continued with a business pilot for the first merchants to use the service. The development of InAcademia follows a stronger agile approach that utilises short sprints to frequently release software enhancements that address stakeholders' requirements.

The roadmap for InAcademia for 2020/2021 focuses on the following areas:

- **Service Status**

  During 2019, the business pilot was successfully completed meeting its objective to validate the anticipated business model. During this time, transition to service production was also prepared with PLM production signoff in January and the official service launch taking place in February 2020. The InAcademia service is offered in two service models: Commercial Edition, which is targeting commercial entities and is a pay-to-use version, and aCommunity Edition, which is targeting the non-commercial services for R&E, and which is free-of-charge.

- **Service Development**

  The service will work to expand into additional countries, working alongside Federation Operators to ensure maximum value is created for them**.** The service team will provide advisory and secretariat functions for the InAcademia Steering Committee (which includes representatives from the federation operators in Europe, as well as the InAcademia service owner and representatives of the InAcademia service operator). The Steering Committee will ensure that the service is developed for the benefit of the federated identity community**.** The service team will continue ongoing engagement with merchants in order to register them for use of the Community and Commercial Editions.

- **Technical Development**

  During the remainder of 2020 and 2021 the focus will be on providing a stable service with minimal need for physical and human interaction for many of the currently manual administrative processes. Further development work will include:

  - A significant enhancement to registration and onboarding processes.
  - Improved customer-facing support in order to improve visibility and trust amongst the GÉANT membership and InAcademia customers.
  - An enhanced discovery service.
  - Optimisation of the software code and development processes.
  - Improved statistics, monitoring and performance for enhanced customer management information.

- **Continuous Operations and Support**

    Continue the operations and support for the production service.

The timeline for the InAcademia roadmap is available online [Roadmap].

6 Conclusions

This document is an update of the T&I services roadmaps first defined in Milestone M5.2 for the period 2019/2020 and presents the current position on T&I services delivery and evolution for 2020/2021. It also demonstrates how T&I service delivery is supported by other teams in the GÉANT project. These roadmaps will be periodically reviewed and updated to keep track of goals, and to add inputs from the incubator activity and requirements from the community via planned consultation activities

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Glossary

AARC	Authentication and Authorisation for Research and Collaboration
AEGIS	AARC Engagement Group for Infrastructures
API	Application Programming Interface
ASREN	Arab States Research and Education Network
BPA	Blueprint Architecture
CACTI	Community Architecture Committee for Trust and Identity
CAT	Configuration Assistant Tool
CoCo	Code of Conduct
eIDAS	Electronic Identification and Signature
EOSC	European Open Science Cloud
EOSC-Life	An open, digital and collaborative space for biological and medical research, bringing together the 13 Life Science 'ESFRI' research infrastructures
ESFRI	European Strategy Forum on Research Infrastructures

EUROfusion	A European programme for the realisation of fusion electricity
FIM4L	Federated Identity Management for Libraries
FIM4R	Federated Identity Management for Research
GDPR	General Data Protection Regulation
GeGC	eduroam Governance Committee
GEOSS	Global Earth Observation System of Systems
GLAD	GÉANT Learning and Development
GN4-2	GÉANT Network 4 Phase 2, a project part-funded by the EC's Horizon 2020 programme under the Specific Grant Agreement No. 731122
GN4-3	GÉANT Network 4 Phase 3, a project part-funded by the EC's Horizon 2020 programme under the Specific Grant Agreement No. 856726
IdP	Identity Provider
IGTF	Interoperable Global Trust Federation
MDS	Metadata Service
NextGEOSS	A European contribution to GEOSS under the H2020 programme
NISO	National Information Standards Organization
NREN	National Research and Education Network
NRO	National Roaming Operator
OIDF	OpenID Foundation
PaNOSC	Photon and Neutron Open Science Cloud
PLM	Product Lifecycle Management
RADIUS	Remote Authentication Dial In User Service
R&E	Research and Education
REFEDS	Research and Education Federations
SG	Steering Group
SIRTFI	Security Incident Response Trust Framework for Federated Identity
SOAP	Simple Object Access Protocol
SP	Service Provider
SSHOC	Social Sciences & Humanities Open Cloud
STM	International Association of Scientific, Technical and Medical Publishers
T&I	Trust and Identity
TLS	Transport Layer Security
TRL	Technology Readiness Level
UmbrellaID	The Federation for the Neutron and Photon Community
WBA	Wireless Broadband Alliance
WISE	Wise Information Security for Collaborating e-Infrastructures
WP	Work Package