The Service Provider Group Framework.

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Slivers, delivered by multiple autonomous service providers will need coordination in order to comply with a particular service level required by a particular slice owner. "Slice Archetype's", defined and supported by a group of Service Providers that have decided to collaborate, is one model that could be further investigated. In particular if a Slice Archetype (from which more specific designs can be derived) defines a particular service level that exceeds a common "best effort" slice, providers typically require authorized access to their slivers. In chapter 5 of his thesis, Gommans [1] described a framework, called the Service Provider Group (SPG), as a way to arrange trust between providers needed prior to allowing access to Service Provider assets.

The willingness of a Service Provider to collaborate within a group is dependent on the benefits each provider can achieve. Well known examples of a Service Provider Group is MasterCard, where competitive banks collaborate to provide payment card services to their customers (i.e. merchants and cardholders). Competitive airlines collaborate in alliances such as Skyteam to expand their networks of destinations that can be offered to their passengers and agree on a common standard to offer services such as allowing lounge access, priority boarding, etc.

Investigating how the Service Provider Group concept can be applied to a collaboration of service provider organizations, where:

- each provider can offer slivers that can become part of a slice stretching across multiple autonomous aggregate managers,
- such slivers have a common notion of service quality requirements,

is the key subject this research contribution.

During the Internet2 Global Summit 2015 in Washington, it was recognized that defining archetypes for slice that deliver for example a guaranteed level of privacy, ranges of scalability, guaranteed availability, disaster recovery capabilities, etc. is a way to organize service delivery in a more scalable way rather then having slice owners and aggregate service providers depend on bi-lateral agreements.

Research into the applicability of a SPG is performed at University of Amsterdam in the context of creating cyber security defence alliances in a joint NWO and COMMIT/ project called SARNET. Here, the Faculty of Law and Computer Science group collaborate to create agent-based models of the behavioural aspects of individual cyber security service providers where each domain interprets a common set of rules in an effort to identify risks and benefits. This effort can collaborate with an NSF effort to further substantiate findings by performing research in GENI context.

References:

[1] Leon Gommans, **"Multi-domain authorization for e-Infrastructure",** PhD thesis, ISBN,9789491602269, http://dare.uva.nl/record/1/432647

Bio's

Ameneh Deljoo is performing her PhD research at University of Amsterdam where she considers the applicability of the Service Provider Group concept within the context of Cyber security and advanced networking. Ameneh received her MSc degree in Information Technology from Shiraz University (Iran, 2012). She moved to The Netherlands in 2012 as a researcher at Delft University of Technology in the ICT department. Her research topic was modeling an organization as a complex adaptive system. Ameneh applied an agent based model to model the behavior of different organizations. Ameneh was involved in different EU projects and also organizer of a workshop in Koblenz, Germany. Before starting her PhD she worked as a software developer for Dutch companies. Her PhD is supervised by prof. dr. ir. Cees de Laat and prof. dr. Tom van Engers as promotors and dr. Leon Gommans as co-promotor.

Dr. Leon Gommans received his PhD in informatics in 2014 from University of Amsterdam on the subject Multi-Domain Authorization Systems for e-Infrastructures. From the start of his career in 1981, he has been involved in the development, deployment and support of commercial computer & networks infrastructures. In 1998 he became involved in network research and standardization efforts. As co-author of a series of IETF RFC's (2903-2906), describing a generic authorization architecture and framework, he decided to research its applicability at University of Amsterdam in 2001. After completing a master course in digital architecture in 2008, he became sr. infrastructure architect with the IT Operations department of Air France KLM that evolved into his current position as Science Officer. He currently researches the role and value of future Internet, Security and IT infrastructure capabilities. He has been appointed as guest researcher within the Systems and Networks Engineering laboratory of Cees de Laat at University of Amsterdam.

Prof. dr. ir. Cees de Laat chairs the System and Network Engineering (SNE) laboratory in the Informatics Institute of the Faculty of Science at University of Amsterdam. Research in his group ranges from optical and switched networking and workflows for processing of big data in PetaScale e-Science applications, Semantic Web to describe e-infrastructure resources, information complexity, Authorization architectures and Systems Security & privacy of information in distributed environments. Prof. de Laat serves on the Lawrence Berkeley Laboratory Policy Board on matters regarding ESnet, is co-founder of the Global Lambda Integrated Facility (GLIF), founder of GRIDforum.nl and founding member of CineGrid.org His group is/was part of EU projects SWITCH, CYCLONE, ENVRIplus and ENVRI, EuroBrazil, Geysers, NOVI, NEXTGRID, EGEE, and others. He is a member of the Advisory Board Internet Society Netherlands and Scientific technical advisory board of SURF Netherlands. A snapshot of his scientific career is available here: http://delaat.net/

Prof. dr. Tom van Engers is head of the Leibniz Center for Law at University of Amsterdam where he works with a group of researchers on formal representation of rules and conformance of business processes to rules. As an active advisor to many governmental organizations, he is experienced in massive case handling systems and organizational change. He is track coordinator of the Business Information Systems Master's program at the Informatics Institute of University of Amsterdam and lecturer of Business IT Alignment, Interdisciplinary Research Methodology for Information Sciences and Rule Governance.