



VISION Cloud



The goal of VISION Cloud is to introduce a powerful ICT infrastructure for reliable and effective delivery of data-intensive storage services, facilitating the convergence of ICT, media and telecommunications. This infrastructure will support the setup and deployment of data and storage services on demand, at competitive costs, across disparate administrative domains, while providing QoS and security guarantees.

At a glance

Project title:

Virtualized Storage Services Foundation for the Future Internet (IP)

Project coordinator:

Hillel Kolodner
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Partners:

SAP (DE),
Telefónica Investigación y Desarrollo (ES),
Siemens AG (DE),
Engineering Ingegneria Informatica Spa (IT),
Institute of Communication and Computer Systems (GR), Deutsche Welle (DE),
RAI-Radiotelevisione Italiana Spa (IT),
Umeå University (SE),
SNIA Europe (UK),
Telenor (NO),
France Telecom (FR),
Swedish Institute of Computer Science (SE),
University of Messina (IT),
iTricity B.V. (NL)

Duration:

October 2010 – September 2013

Total cost:

€ 15.7 M

Website:

<http://www.visioncloud.eu>

How is VISION Cloud unique?

The explosion of personal and organisational digital data has been recognised as one of the most significant characteristics of the decade. Generated data is growing faster than we can store it. In parallel our society has become critically dependent on services to extract valuable information from the data and drive decision making by individuals, businesses and government, across all aspects of life. In the emerging era of the Future Internet, the explosion of raw data and the dependence on data services is expected to be further amplified due to two important trends, namely the strong proliferation of data-intensive services and the digital convergence of telco, media and ICT.

The primary deliverables of VISION Cloud will be an architecture and a reference implementation of a cloud-based infrastructure, built on open standards and new technologies, to provide a scalable, flexible and dependable framework for optimised delivery of data-intensive storage services. We will demonstrate how this VISION Cloud infrastructure -- where an object data model, computational storage, content-centric access, comprehensive data interoperability, and QoS and security guarantees play a central role -- supports new emerging telco/media services. In doing so, we aim to achieve significant and quantifiable improvements in service delivery productivity, quality, availability, reliability and cost.

Innovations

The VISION Cloud project is based on the following ideas:

- **Raising the Abstraction Level of Storage:** encapsulating storage into objects with user-defined and system-defined attributes (a.k.a. “meta-data”). This metadata supports effective access, management and manipulation of the storage and stored data and derivation of new information. With that, we enable high scalability and simplification of all storage and data functions.
- **Data Mobility and Federation without Boundaries:** substantially extending the limited data migration capabilities available in contemporary infrastructures to migrate and federate data across geographically distributed administrative domains, ensuring comprehensive and transparent data interoperability and overcoming the problem of data lock-in.
- **Computational Storage:** providing an architected solution for bringing computing to storage, enabling secure execution of computational tasks near their data, applicable both to user-driven computational tasks as well as autonomous data derivation and transformation.
- **Content Centric Storage:** facilitating access to data by content and its relationships, rather than details of the underlying storage containers, further supported by mechanisms to define domain-specific storage optimisations, and altogether leading to highly simplified and efficient storage access.

- **Advanced Capabilities for Cloud-Based Storage:** combining the base concepts of cloud computing with additional capabilities of storage virtualisation, advancing the state of the art by creating a platform where data-intensive services can be provided securely, at the desired level of service, and at competitive costs.

Use Case Driven

VISION Cloud has a validation methodology based on representative Future Internet use cases, where data-intensive services are fundamental:

- **Media:** Allow professionals as well as non-technical experts to quickly and efficiently produce new media-rich content, re-purpose existing content and distribute content through multiple channels, for consumption by users on multiple types of end devices.
- **Telco:** Enable large numbers of mobile end-users to safely access content on heterogeneous devices. Enhance the efficiency of content-rich applications by allowing fast adaptation to change in user context (e.g., location and device).
- **Healthcare:** Access healthcare data based on its content and its relationships, and automatically extract metadata from large volumes of medical data.
- **Enterprise:** Support multi-tenant cloud-native business applications, leveraging the advanced data model to provide database-like capabilities and efficiently migrate tenant data.

This set of use cases collectively demonstrates the capabilities and innovations of VISION Cloud.

