Global Identity and Reachability Framework for Interoperable P2P Communication Services

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Real time communication platforms and services
Introduction

➢ The two types of Communication service delivery models

– Old Fashioned Federated Telco
  ▪ Limited innovation, not flexible enough
  ▪ Access controlled communication services
  ▪ Reliable Service
  ▪ Well defined standards to enable universal interoperability

– Walled Garden Over The Top (OTT)
  ▪ Much more competitive and Agile
  ▪ Not constrained by Standards
  ▪ Can't interoperate with users from other domains
  ▪ No portability of Identity or User Data
The reTHINK project proposes a new web centric Peer-to-Peer service architecture:

- Decentralized session control
- Empowering the endpoints to manage the flow of media
- Global reachability with de-perimeterised services
- Secure, non-service-bound, privacy enabled identities
- Cross domain interoperable
- QoS beyond best effort
- WebRTC real time P2P communication capabilities
Trustworthy global identity and reachability framework is required to have the following features:

- Cross domain interoperable
  - Communicate with user identified in other services
- Identity portability across service providers
  - Without losing identity details or contact lists
- Identity decoupled from service providers
  - Use of Independent Identity Provider (IdP)
- Global searchable
  - Searchable across any domain
- Trust-enhanced identity features
  - IdP-certified identity
  - Complemented by Trust Engine
The reTHINK framework relies on:

- **Hyperty** (Hyper linked entities): a module of software logic that is dynamically deployed in an endpoint.
- **Hyperty instance** represents a ‘live’ user that can be discovered and contacted dynamically.

Fig 1: Hyperty Concept
Four components:

1. Identity & Trust management
2. Directories services
3. Graph Connector
4. Governance & Policy

Fig 2: reTHINK functional architecture
Identity Management

- Identity Provider (IdP):
  - Provide, manage and verify user identities

- IdModule
  - Software module that preserves identity of users
  - Platform for IdP proxy execution
  - Enable users to choose the adequate identity

Trust Management

- The trust engine consists two basic modules
  - Authentication validation
    - The identity is verified from the issuing IdP
  - White and Black list:
    - Indicates whether identity is known for good or malicious behaviour

- Trust vectors can be indicated in plain text or symbols
Catalogue & Discovery services

 Catalogue Service
  – Stores information about the Hyperties of CSP’s available for use
  – Provides means for the end device to obtain (download) the implementation of a Hyperty

 Discovery Service
  – Provides services to find people across different networks or domains
  – Discovery of user based on what you already know
  – Each user is free to create his own entry in the discovery registry and publish data
Two types of identifiers

- Global Unique Identifier (GUID)
  - Domain agnostic, remains same irrespective of CSP
- User Identifier (UserID)
  - Domain dependent identifier
  - Used to locate the actual location of user device

Registry services:

- Global registry:
  - Resolves user GUID to CSP specific User ID
- Domain registry:
  - Translates UserID to Hyperty instance address of user
  - Information about running Hyperty instances are published and updated
Graph Connector & Policy Management

➢ **Graph Connector** is a local address book maintaining a list of known communication endpoints
  – A distributed, qualitative/quantitative-weighted social network
  – Estimate trust level between unknown users for Trust engine

➢ **Governance** involves management of defined rules expressed through **Policies**
  – Classical PDP/PEP Policy repository structure
  – Distributed among
    • End user devices:
      Policies specific to the device local resources
    • CSP infrastructure:
      Policies defined by the CSP and accepted by the end user
reTHINK Call flow scenario

Fig 5: reTHINK call flow sequence
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reTHINK envisions to overcome the challenges of traditional Telco and OTT models by providing a new web centric P2P architecture.

The aim of reTHINK identity & reachability framework is to have:
- Non-service-bound Identities
- Global searchable and reachable users
- Cross domain interoperability
- Portability

This is achieved using four specialized components: Identity & Trust management, Directory services, Graph connector, Policy & governance.
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