Multi-device Single Sign-on for Cloud Service Continuity

Patricia Arias Cabarcos, Florina Almenares, Rosa Sánchez, Andrés Marín and Daniel Díaz-Sanchez
University Carlos III of Madrid

http://pervasive.gast.it.uc3m.es/
Outline

Introduction
- Multimedia Services on the age of Cloud Computing
- Multi-device Single Sign-On (MD-SSO)

A MDSSO system for Cloud Computing
- Requirements
- Middleware Architecture

Implementation

Conclusions & Future work
Introduction

- Multimedia Services on the age of Cloud Computing
- Advances in Consumer Electronics: devices, capabilities,… New scenarios
Multidevice Single Sign-On (MD-SSO)

- **MD-SSO Definition**:

  *Single sign-on for users that crosses devices, i.e. the session is initiated from one device or user-agent, and subsequently transferred to a second, as might be desirable in the enjoyment of long running media, e.g. streaming video*

- **MD-SSO Implications in Cloud Services**:
  - Indispensable for Service Continuity
  - Necessary for security: session management
MD-SSO Use Case

Cloud providers

session transferred

session transferred
MD-SSO and Service Continuity

Related Work

Service Continuity solutions nowadays:
- Focus on specific modifications to protocols
- Concentrate on proprietary implementations
- Impose security problems

Research Challenges

Service continuity based on session transfer is possible, but:
- Few implementations exist
- Further requirements to be addressed in Cloud scenarios

A generic framework is required for mainstream adoption.
MD-SSO and Service Continuity

We propose:

- Open and holistic architecture
- New layer embedded in CE → abstracts the complexity of session transference
- Interworking between heterogeneous devices

The approach involves 3 well defined steps:

- Requirements analysis
- Architecture definition
- Prototype implementation
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MD-SSO system: Requirements

<table>
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<th>Functional Requirements</th>
<th>Non Functional Requirements</th>
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<td>Context management</td>
<td>User centricity</td>
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<td>State management</td>
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<td>Session transfer</td>
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ICCE'12
MD-SSO system: Architecture
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Configuration Manager
- Configuration and personal user data

State Manager
- State Extractor
- State Processor

Communication Manager
- Event Processor
- Communication Abstraction

Context Manager
- Context Extractor
- Context Processor

USER INTERFACE

MDSSOResponse

MDSSOResquest
MD-SSO system: Architecture
MD-SSO system: Architecture
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Conclusions & Future work
We have:
- Defined the middleware (APIs, communication primitives, storage formats..) and partially developed a prototype implementation for Android

Currently working on:
- Testing a use case: state of the browsing activity is transferred between 2 devices
- Defining testbed for performance measurement
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Conclusions and Future work

- Introduction of MD-SSO for service continuity in Consumer Cloud

- Definition of a generic middleware architecture:
  - enhances the user experience when consuming services on the move and changing terminals.
  - fosters healthy progressive adoption by industries and users.
  - formally defined APIs, communication primitives, storage formats …

- Partial implementation of the prototype “MD-SSO architecture” and test of use cases (transfer of web browser activity).

- As future work:
  - Complete and validate the prototype system (performance, interoperability, usability…).
Thanks for your attention!
Questions?