



Challenges emerging from future cloud application scenarios

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Method

- Papers accepted for CF2015
- Authors invited to contribute (also) a short position paper
- These were analysed and edited into this paper by PC Chairs (Dimosthenis Kyriazis and Keith Jeffery)
 - The work concentrated on extended application scenarios
 - And the advancements in CLOUD Computing required to support them
- Views are those expressed by the contributors

Future Application Scenarios

- Joint Collaborative Business Intelligence platforms with multiple data sources
 - SMEs cannot afford BI systems
 - Provision of shared multi-source BI platform
- Knowledge on the Cloud
 - Convergence of CLOUD and cultural heritage
 - Utilisation of CLOUDs for environmental systems

Future Application Scenarios

- Knowledge from the Cloud
 - MOOCs, online tutorials, screen-casts
 - Laboratory teaching
- Software Development on the Cloud
 - CLOUD IDEs
 - MDD: Model Driven Development

Future Application Scenarios

- Joint Application/Infrastructure controllability
 - Need coordination of resource management and application demands
 - Control systems
- QoS / QoE critical applications on the cloud
 - CLOUD virtualisation in some ways hinders realtime / time critical applications
 - Need coordination of resource management with application demands
 - Need rapid elasticity

Future Application Scenarios

- Adaptable Parametric Applications
 - ‘live’ applications sensing their (CLOUD) environment and self-adapting
 - Problem of DDOS (Distributed denial of service) attacks
- Generic Application Templates
 - Template for application and its workflow: only need to change a few parameters at runtime

Analysis and Reduction

- Taking these scenarios and analysing their demands on the CLOUD SPI (Software / Platform / Infrastructure) Stack
- Leads to four major areas for research and development :
 - Cloud service and application integration
 - Development environments and abstractions
 - Interoperability
 - Legal and IPR Issues

Mapping Application Scenarios to Required Advancements in CLOUDs

Table 1. Mapping between Application Scenarios and Advancements.

	Collaborative BI	Knowledge Gathering	Knowledge Acquisition	Software Development	Time Critical Controllability
Cloud Service and App Integration	X		X		X
Development Environments and Abstractions	X			X	X
Interoperability	X	X		X	X
Legal and IPR	X	X		X	

The exercise of considering extended application scenarios and characterising advancements required in various aspects of CLOUDs leads to the table above.

Cloud Service and Application Integration

- Two models:
 - composite cloud services and service brokerage
 - Cloud vendor enriches service with third party services
 - Integration Platform as a Service (IPaaS)
 - unifying, bridging and orchestrating various backend or frontend cloud services
- Objective: Relieve the customer of administration of various APIs, platforms, systems development and lifecycle management
 - Security and authorization aspects of integration platforms
 - Service Network Definitions and Semantic Descriptions

Development Environments and Abstractions

- Programming Abstractions
 - Higher level and multiple level
- Workbench
 - SWITCH Project
- Cloud-based IIDEs
 - Range of tools
 - No need for powerful local computer
 - Re-usable code

Interoperability

- Technical Interconnection
 - service platform should allow moving data, applications, and/or virtual machine images without restrictions
 - Ad Hoc solutions → model-driven
- Semantically Linked Data
 - Linking graph across RDF repositories
 - Problems of efficiency and representation

Legal and IPR Issues

- Legal Issues
 - Service platform conform to local legislation: ‘fair dealing’
 - Security, privacy
 - Particularly important to have IPR agreements for interoperability

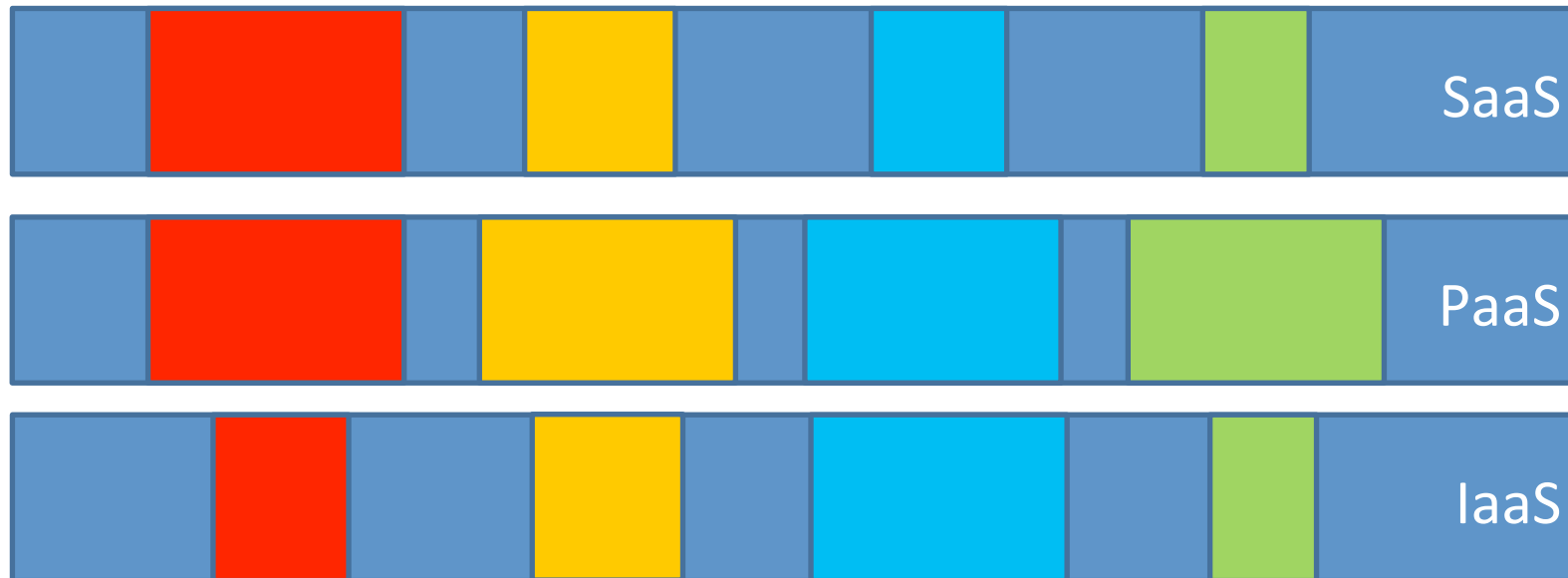
The Challenges related to SPI Model

Cloud
Service &
Application
Integration

Development
Environments
and
Abstractions

Interoperability

Legal and IPR



Detail in the Paper

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