

CLOUD  
FORWARD  
CONFERENCE

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# Initial CF2016 Roadmap

Keith Jeffery, Lutz Schubert

*E-mail address:*

[keith.jeffery@keithgjefferyconsultants.co.uk](mailto:keith.jeffery@keithgjefferyconsultants.co.uk)

[lutz.schubert@uni-ulm.de](mailto:lutz.schubert@uni-ulm.de)

# Method

- Position Papers accepted for CF2016
- Scientific papers for CF2016
  - Trawled for ideas during the review phase
- These were analysed and edited into this paper by PC Chairs (Keith Jeffery & Lutz Schubert)
  - With some influence from various EC expert groups, project cluster discussions
  - HOLACloud Portal used for recent topics, relevance and importance

# Analysis

- All position and scientific papers were analysed for
  - technological key themes
  - major challenges
  - development status
- Key topics were verified against the HolaPortal
  - verifying general interest in the topic
  - assessing the timeline
- Views in the roadmap are those expressed by the contributors

# Review: Major Topics 2015

- Trust, security, privacy
  - Fear of computing outside of own organisation
- Interoperability
  - Across heterogeneous platforms
- Business Models
  - To justify CLOUD computing
- And to a lesser extent...
- Systems development environments

# What has Changed 2015-2016

- Greater take-up, use, experience of CLOUD Computing;
- Emergence of FOG/EDGE computing
  - Linking with internet of things
- Interoperation
  - Across platforms and including FOG/EDGE
- Increased complexity of applications
  - Their requirement for NFRs (SLAs) to be respected
  - Their requirements for placement and locality
- ➔ need for advanced systems development methods
  - Model-driven and beyond

# Major Topics 2016

- advanced systems development method(s)
  - based on model-driven technology;
- placement and locality
  - of data, software, resources and users;
- autonomic SLA management to meet NFR
  - pervasively through the software stack including trust, security and privacy based on policy enactment;
- interoperability & portability
  - across hybrid CLOUD platforms and across heterogeneity of data and software, devices and users

# Advanced Systems Development Methods

- Challenges
  - Complexity of FR and NFR
  - Heterogeneity of platforms
    - And their capabilities / service offerings
  - Heterogeneity of code components
    - Including legacy code
  - Diversity of Data
  - Complexity of interstitial interfaces
  - Programmability & usability

# Placement and Locality

- Overcoming latency over networks
- Co-location of relevant data and software on appropriate platform
  - Pre-fetch and cache
  - NFRs
- Partitioning and sharding of datasets
  - for availability
  - for security



# Autonomic SLA Management

- Policies encoded in logic
  - Resolve inconsistencies with end-user or sysadmin
- Pervasive congruent management of NFR parameters through the whole software stack
  - No open trapdoors for access
- Composition and decomposition

# Interoperability & Portability

- Application deployment across platforms
  - Complete or partitioned
  - Dynamically (scale out/in)
- Many constraints such as
  - Placement/locality
  - SLA management/NFRs
- Data usability across applications

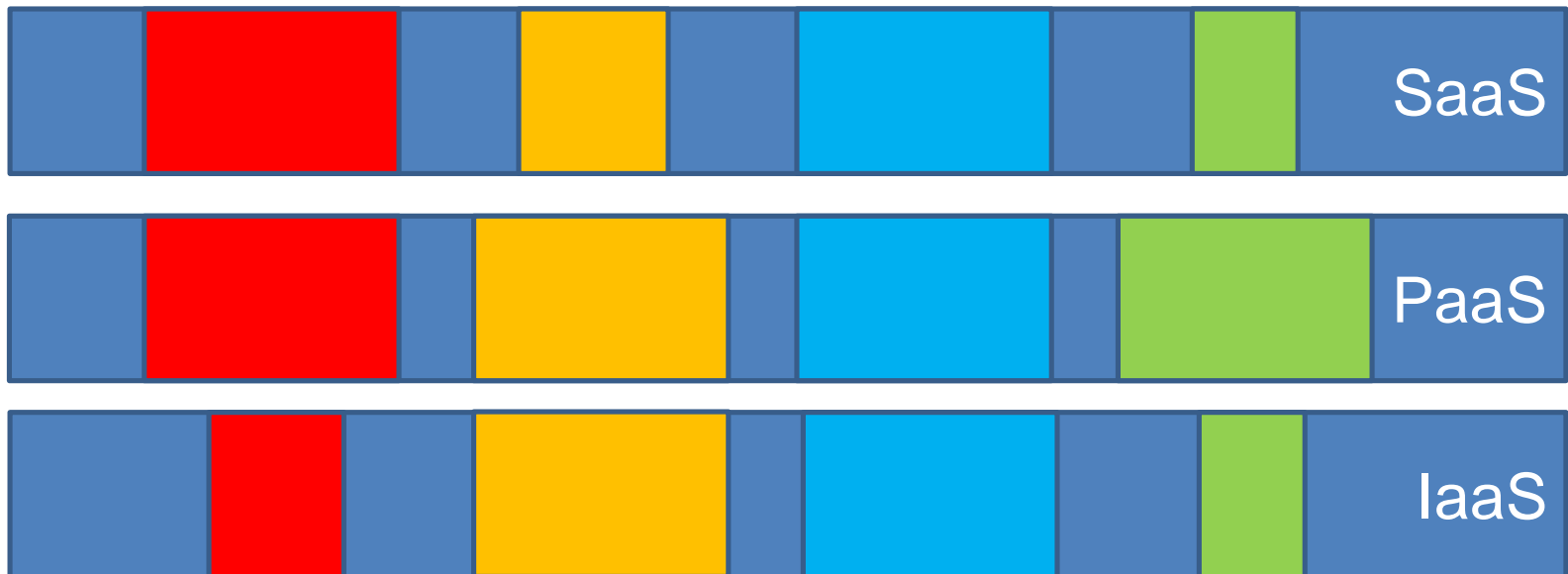
# The Challenges related to SPI Model

Advanced Systems Development Methods

Placement and Locality

Autonomic SLA management policy driven

Interoperability Portability Comprehensible data



# Detail in the Paper

Keith G Jeffery; Lutz Schubert (2016)  
'Initial 2016 HOLACloud Roadmap'  
at Cloud Futures: From Distributed to Complete  
Computing,  
CF2016, 18-20 October 2016, Madrid, Spain.  
Procedia Computer Science PROCS 9715  
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