Initial CF2016 Roadmap

Keith Jeffery, Lutz Schubert

E-mail address:
keith.jeffery@keithgjefferyconsultants.co.uk
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

SaaS

PaaS

IaaS
Detail in the Paper