Accountability for the cloud and other Future Internet services

8th March 2016

Cloud Accountability Project Workshop, collocated with Cloudscape 2016

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Session Welcome and Openings

Legacy of the Cloud Accountability Project
- Accountability Framework
- Reference Architecture and Accountability Lifecycle
- Contribution to Standards

Demonstrator Use Cases and Tools
- Demo of accountability tools contextualised in demonstrator use cases tailored to cloud stakeholders
- Provision of the Account and Assurance

Feedback and Discussion
Legacy of the Cloud Accountability Project
Demonstrate Accountability

- Accountability Attributes
  - Conceptual elements of accountability as used across different domains

- Accountability Practices
  - Emergent behaviour characterising accountable organizations

- Accountability Mechanisms
  - Operational processes, non-technical mechanisms and technical tools that support accountability practices

**The Accountability Framework**

Transparency
Responsiveness
Responsibility
Remediability
Verifiability
Effectiveness
Appropriateness

Defining governance
Ensuring governance
Demonstrating governance
Holding to account

Different mechanisms supporting accountability (Preventive, Detective, Corrective)
This project is partly funded from the European Commission’s Seventh Framework Programme (FP7/2007-2013) under grant agreement no: 317550 (A4CLOUD).
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### Summary of contributions to standards

**Maximise project impact and support sustainability**

<table>
<thead>
<tr>
<th>Area</th>
<th>A4Cloud contributions</th>
<th>Main focus</th>
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| Service Level Agreements | • Linking to evidence.  
                          • Accountability policy representation (A-PPL).  
                          • Terminology, cloud SLA management.  
                          • Accountability SLO’s.                                                               | • CSA Privacy Level Agreements  
| Assessment and Certification | • Accountability Maturity Model.  
                          • Accountability metrics.  
                          • Continuous monitoring.                                                  | • CSA Open Certification Framework  
                          • CSA Cloud Trust Protocol  
                          • CSA Cloud Controls Matrix  
                          • ISO/IEC 19086 Part II “Cloud computing – Service Level Agreement (SLA) Metrics”  
                          • ISO/IEC 19086 Part IV “Cloud computing – Service Level Agreement (SLA) Security and Privacy”  
                          • NIST Cloud Service Metrics Model                                                |

Cutting through a “jungle of standards”

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Summary of contributions to standards

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<tbody>
<tr>
<td>Risk Management</td>
<td>• Contributions to the risk model.</td>
<td>• NIST Cloud Adapted Risk Management Framework.</td>
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<td>• Risk management/assessment.</td>
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<td>Privacy Impact assessment (PIA)</td>
<td>• PIA and the accountability dimension.</td>
<td>• ISO/IEC 29134 “Privacy impact assessment – Methodology”.</td>
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<td></td>
<td>• Synergies with DPIAT.</td>
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<td></td>
<td>• Enable external auditing.</td>
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Other strategic contributions:
• ETSI Cloud Standards Coordination Phases I and II
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Demonstrate accountability

• How it works for use of personal data in a cloud service supply chain
• How the prototype tools developed by A4Cloud support accountability

Demonstrate tool support

• Show how they work for each of the relevant cloud actor roles
• Illustrate how they can be integrated across the supply chain, in the context of the Cloud Accountability Reference Architecture
• Relation to accountability support services and artifacts
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The A4Cloud Tools

Policy Definition and Enforcement
- AccLab
- DPPT
- A-PPL Engine

Evidence and Validation
- AAS
- DTMT

Incident Management and Remediation
- IMT
- RRT

Data Subject Controls
- DT
- PAPV
- TL

Contract and Risk Management
- DPIAT
- COAT

Privacy and Security Requirements
- Organisational Policies
- Obligations

Impact Assessment Report
- Cloud Selection

Audit Report
- Accountability Policy
- Evidence
- Logs
- Notification
- Remediation
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Five Demo Scenarios

Demo 1
Cloud Contract Selection and Impact Assessment
COAT, DPIAT

Demo 2
Implementing Policy
DPPT, AccLab, A-APPLE

Demo 3
Incident Management
TL, DTMT, AAS, IMT

Demo 4
Monitoring and Audit
TL, AAS

Demo 5
Data Subject Controls
DT, RRT, TL

CLOUD ACCOUNTABILITY PROJECT
Integrate real time data, recorded by your wearable device.

Gather, manage and store personal data of the wearable users to keep track of their health status over time for long wellbeing preservation.

Collect and store wearable data
Get visualised global statistics
Process data in an accountable manner
Different **security and privacy controls** are deployed across cloud supply chains.

It is challenging to provide **transparency and assurance** to cloud customers.

Security and privacy depend on the **operational effectiveness and appropriateness** of deployed controls and their dependencies.

It is necessary to have technological support in order to provide an account operationally.

It is challenging to support **operational compliance** to policies and regulations.
Feedback and Discussion
Do the A4Cloud tools address accountability in the cloud?

- Perception on coverage
- Acceptance and expected learning curve

Long term impact

- Contribution to the data protection/accountability practices when operating a cloud business

Expected value of tools and mechanisms in today’s cloud infrastructures: Please give us your view!
Discussion