the Enabler for Cross-domain Open Distributed Systems of Systems, like IoT

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UniversAAL – Open Horizontal Service Integration Layer across all Verticals

- Originally resulted from consolidation of promising AAL platform approaches into one open standard platform for interoperable AAL solutions

- Built on
  - the only existing (since 2008) implementation of semantic interoperability for SoA at the level of communication protocol
  - using semantic Web technologies for unified representation of data regardless of domain and extraction technology, unified cross-domain query language, and externalizable and sharable domain models

- Avoids domain-specific APIs by reducing syntactical dependencies to one single brokerage API

- Future-proof contribution to managing complexity for the general IoT
universAAL – The Open Source Software

→ Apache Software License 2.0

- The Middleware (Container, Data Representation, Discovery & Peering, uni- & multicast Messaging, Communication Buses)
- The Managers (Context History Entrepôt, Profiling, Reasoners, Dialog Manager, Space Orchestrator, Space Gateway, …)
- Some concrete Ontologies
- Tools (AAL Studio, universAAL Control Center -- uCC)
- Example AAL Services
- uStore (the open source part on top of Websphere)
- Reference documentation and the Wiki pages
- Training material

http://universaal.aaloa.org/
Bringing the Evidence

- Various "platform" projects:
  - Amigo
  - GENESYS
  - MPOWER
  - OASIS
  - PERSONA
  - SOPRANO

- Large-scale real-life deployments in:
  - DE
  - DK
  - ES
  - FR
  - GR
  - IT
  - NL
  - NO
  - SI

- Before universAAL:
  - 2010
  - 2014
  - 2016

- Websites:
  - www.universaal.org
  - depot.universaal.org
  - forge.universaal.org
  - www.cip-reaal.eu
ReAAL as Stress-tester of UniversAAL

- 30+ applications ported to UniversAAL as the common open service platform
- 100+ services based on these applications
- 6,000+ users benefiting from them in 13 pilot sites in nine countries
- Six months of evaluating the socio-economic impact during operation in real life, involving tens of new stakeholders

Expected Impact: Enlarge the UniversAAL ecosystem and penetrate the market with ReAAL’s initial portfolio of applications
# UniversAAL Value Proposition

<table>
<thead>
<tr>
<th>Demand</th>
<th>Supply</th>
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<tbody>
<tr>
<td>Usage</td>
<td>Production</td>
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</tbody>
</table>

### Connectivity
- Plug and Play
- Multi-vendor
- No vendor lock-in
- Affordability

### Future-proof
- Wider & more efficient B2B
- Standard API

### Trust
- Consistent user experience

### Cross-application consistency

### Replicability
- Leaner development processes

### Acceptance
- Scalability

### Sustainability
- No vendor lock-in
- Scalability

### Leaner processes
- Development
- Maintenance

### Leaner processes
- Deployment
- Support

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**Documentation:**
- Open API
- Open Scope
- Semantic Interoperation
- Security
- User Interaction & Accessibility
- Intelligent Behaviour
- Development
- Deployment
- Support

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**Discussion:**
- ISO / IEC PAS 62883
- under discussion in oneM2M

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Standardization Benefits given by universAAL

- Separation of concerns
- Lean API, easier to maintain
- Highest abstraction layer for the Internet of Things
- Multidimensional benefit from ontologies a la universAAL
  - Sharing both data and functionality over same API
  - Looser coupling → more independence → surprising interoperability achievements
  - Declarative by nature → mapping one ontology to another and achieving interoperability without necessarily involving vendors
  - Certain level of intelligence given already at the level of brokerage and by specific platform managers
THANK YOU FOR YOUR ATTENTION!

Questions?

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