GAS Ontology
An ontology for collaboration among ubiquitous computing devices

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eGadgets (eGts) are everyday tangible objects enhanced with sensing, acting, processing and communication abilities

eGts exhibit a dual presence:
  • “tangible” objects
  • “digital objects”
Plug - Synapse

eGts services are manifested as **Plugs**

**Plugs** are software classes that make visible eGts capabilities to people and to other eGts

**Synapses** are associations between two compatible plugs

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eGadgetWorlds (eGWs) are dynamic distinguishable, functional configurations of associated eGts, which communicate and / or collaborate in order to realize a collective function

eGWs are formed purposefully by an actor (user or other) and appear as functionally unified entities
**Gadgetware Architectural Style (GAS)** provides the conceptual and technological framework for creating eGWs and using them in a consistent and intuitive way.

GAS defines:
- an architectural vocabulary (eGt, Plug, Synapse, eGW)
- configuration rules (for Synapse establishment, eGW storage, …)
- a technological infrastructure (the GAS operating system, …)

**GAS Ontology** provides the common language for the communication and collaboration among eGts
- Describes the semantics of the basic terms (eGt, Plug, Synapse, eGW)
- Defines the relations among them

GAS Ontology ensures
- eGts replacement feasibility
- Plugs compatibility
- Services discovery
GAS ontology consists of two layers: GAS Core and GAS Higher ontology

**GAS Core ontology** (GAS-CO)
- describes the semantics of the basic terms
- defines their relations and their roles
- provides the common language among eGts

**GAS Higher ontology** (GAS-HO)
- contains eGt acquired knowledge
- is eGt private ontology

**Building GAS Ontology**

**DAML+OIL** is a semantic markup language
Supports multiple inheritance, property constraints (domain, range, cardinality), default property values

**Protégé-2000** is an easy to use graphical interactive ontology editor
Characterized by its scalability and extensibility
Is component-based
Supports storing and importing ontologies in DAML+OIL
Ontology Manager

**GAS - operating system** manages the resources of eGts and enables participation in eGWs through plug and synapse management services.

**Ontology Manager** is responsible for the interaction of the eGt with its stored ontology and the management of this ontology.

Edits GAS-HO, making feasible the “storage” and “abstraction” of knowledge.

Enables the exchange of knowledge from eGts’ ontologies.

Composes eGts’ queries.

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