Context-awareness support

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1 Analyzed Systems

Context-awareness support includes toolkits, frameworks, middleware, and service infrastructures that have been proposed to support developers of context-aware applications. To carry out our study we selected a set of systems to be analyzed based on the extent of their completeness and utilization in supporting various context-aware applications. Moreover, availability of source code and number of publications were two relevant qualifying factors. In our study, we analyzed the following systems:

Context Toolkit: [1], [2], [3], [4]
RCSM: [5], [6], [7], [8]
Solar: [9], [10]
Confab: [11], [12]
JCAF: [13]
Gaia: [14], [15], [16], [17]
Sentient Model [18], [19], [20], [21]
TEA framework: [22], [23]
Aura: [24]
CARISMA [25]
ReMMoC: [26]
MobiPADs: [27]
Active Campus: [28]
Carmen: [29]
Context on mobile devices: [30], [31], [32], [33]
Smart-its: [34], [35]
DiSUS: [36]
Carmen, AGAPE: [37]
Storage issues: [38]
Ontologies: [39], [40], [41]
Multisensor: [42]
Context management [43], [44], [45]
Context modeling: [46], [47]
Others: [48], [49], [50], [51]

2 List of requirements

This is an approximate list of requirements that context-awareness support systems need to address to support context-aware applications.

Generic requirements:

- Resource discovery
- Uniform abstraction
- Programming model
- Security, privacy, trust management
- Modularity and separation of concerns
- Transparent and distributed communication
- Independence of hardware, operating systems and programming languages
- Reusable components

Intermediate requirements:

- Heterogeneous context src
- Context history
- Context Inferring and reasoning
- Context updates and model communication (e.g., event-based, tuple-based, etc.)
- Context sharing

Context-specific requirements:

- Separation of context-triggering rules and corresponding actions to issue
- Reusable context-processing
- Integration of new sensors, devices, services
- Rules conflict resolution mechanisms
- Application-driven support to context control and monitoring

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