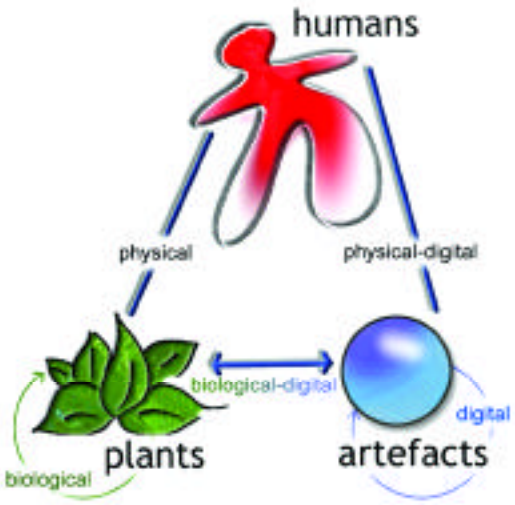
ePlantOS

ePlantOS enables plants to become components of ambient distributed systems, via wireless communication channels within mixed societies of artefacts and plants. It is a middleware software layer that manages local resources (sensors, actuators, processor, and wireless communications), implements Plugs, provides persistence and connectivity services, supports service discovery and manages Synapses.

The subset of ePlantOS services, which are absolutely important in order to support the Plug/Synapse model, have been included in a coherent module, the ePlantOS kernel. This core module implements the “digital self” of an ePlant. One research goal aims to minimize the size of the ePlantOS kernel and the resources (processing power, memory, bandwidth, etc.) it requires and to improve its performance. All other ePlantOS modules can be considered as add-on tools, which when present, can enhance the versatility and the services offered by the middleware.



Key abstractions

Plug
A software abstraction of a property / service offered by an artefact, or a property / ability of a plant

Synapse
A virtual channel between compatible Plugs that enables data and event exchange

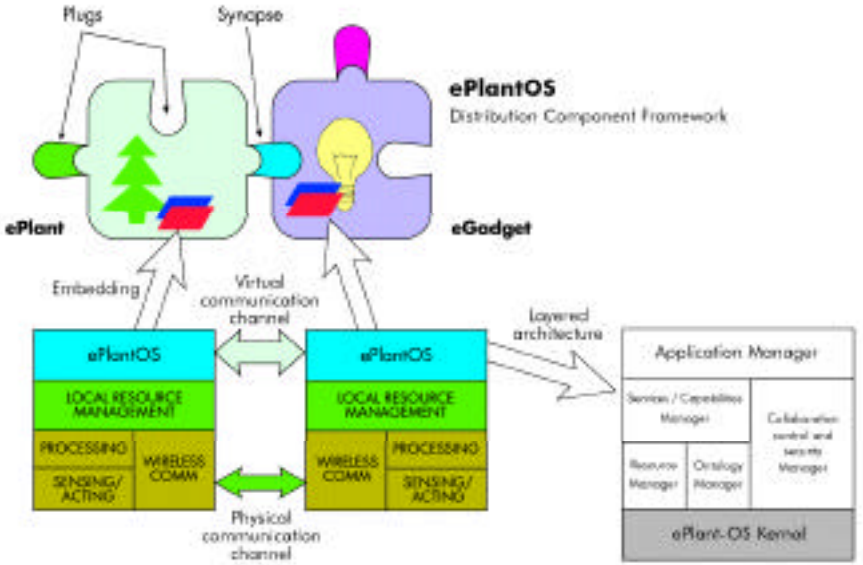
bioGadgetWorld
A distributed system formed as a composition of plants and artefacts

The Plug/Synapse model

The Plug/Synapse concept provides a model of Peer-to-Peer computing which is independent of the underlying programming protocols. It facilitates the development of mixed societies by hiding the heterogeneity of the underlying environment and provides easy-to-use abstractions to access eGadget / ePlant-specific capabilities.

Users do not need to be engaged in any type of formal programming in order to compose a bioGadgetWorld that achieves the desired functions. However, they need to be provided with tools so that they can compose, trace and debug the applications in a flexible manner. Two such tools are:

- **BioGW Editor:** an application that supports the establishment and management of bioGadgetworlds in a user-friendly manner.
- **PLANTS Ontology:** a tool that provides the common basis for the communication and collaboration among ePlants and eGadgets, by describing the semantics of the basic terms and defining the relations among them.



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