Active Architectures

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Software that cannot change is condemned to atrophy: it cannot accommodate the constant revision and re-negotiation of its business goals nor intercept the potential of new technology. To accommodate change in such systems we have defined an active software architecture to be: dynamic in that the structure and cardinality of the components and interactions are not statically known; updatable in that components can be replaced dynamically; and evolvable in that it permits its executing specification to be changed.

Here we describe the facilities of the ArchWare architecture description language (ADL) for specifying active architectures. The contribution of the work is the unique combination of concepts including: a π-calculus based communication and expression language for specifying executable architectures; hyper-code as an underlying representation of system execution; a decomposition operator to break up and introspect on executing systems; and structural reflection for creating new components and binding them into running systems.