Australian Government

Department of Defence
Science and Technology

Layered Approach to Service Architectures for a Global Network Environment (LASAGNE)

The future of combat and mission systems

How can the Australian Defence Force meet aspirations of an interoperable joint capability when new systems are stove-piped and partitioned, rather than agile and connected? The Defence Science and Technology (DST) Group has developed LASAGNE, the Layered Approach to Service Architectures for a Global Networked Environment, an interoperable open architecture that enables future Combat and Mission Systems to become highly concurrent and networked computing environments. The approach is suitable from tactical to enterprise, from embedded to large scale, and from real-time to modelling systems. DST is providing access to this technology at no cost.

A layered approach to system design

The LASAGNE approach abstracts away hardware and operating system dependencies leading to reduced system integration and obsolescence issues. The Pattern Oriented Software Architecture (POSA) techniques empower software developers to remove tight coupling to specific vendor implementations and focus on the operational business logic. The layers enable reuse of trusted components and the introduction of new capability to address rapid technology changes, to reduce system integration costs, and to ensure war-fighters can perform their missions with an integrated set of tools.

The LASAGNE exemplar implementation is a software framework that supports concurrent (multi-threaded), interoperable, portable, deterministic and real-time software services in C++. This technology is extensible and configurable. It is based upon commonly used open standards, with frameworks for new communication protocols, adapters for legacy interfaces, and the concept of dynamically loadable software components from an application store.

Application into joint, air, land and sea domains

Domain specific software components and information models are hosted on top of the LASAGNE layers. The approach can be applied to military and commercial domains as the framework manages opaque data types and promotes concurrent connections including bridges between sub-systems. Systems of systems are synthesised through orchestration and dynamic deployment of services.

Stage of development

LASAGNE is currently assessed as Technology Readiness Level 5/6 with a mature core framework and laboratory tested operational components.

Collaborative opportunities

DST is promoting a community of interest for this technology, providing access at no cost, and seeking creative partners to position their Combat and Mission System components into the joint capability of the future.

For further information:

Michael.Mathers@dsto.defence.gov.au

DST GROUP   Science and Technology for Safeguarding Australia