



Advanced Technology Laboratories

# TECH BRIEFS

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*Technology: Extensible Mobile Agent Architecture (EMAA)*

## A Solid Technology with Expanding Applications

Almost anyone who has used the Internet has interacted with software agents. For example, job-posting sites use agent technologies to let users search for and be notified of specific job opportunities meeting the user's criteria.

An agent is a software program that performs tasks on behalf of an operator. A typical task is to report a specific change in data conditions as the result of an event. For example, an operator can configure an agent to monitor the movement of a ship into or out of a port. During the course of transit, ship position messages are collected and evaluated. As the ship enters the port, the agent detects the position update and reports that event to the operator.

Agents execute with little or no operator interaction and feedback, and provide persistent, dependable, continuous information retrieval and processing. Agents can be deployed in any environment and on any network—from service-rich, bandwidth-friendly enterprise networks to transient, limited-resource edge networks.

Lockheed Martin Advanced Technology Laboratories (LM ATL) continues to advance the performance, utility, and man-

agement of mobile agents in military domains. LM ATL developed the Extensible Mobile Agent Architecture (EMAA) in 1995. Since then it has been used in more than 35 applications. EMAA is a software library that provides a foundation to enable software engineers to quickly develop robust and reliable, distributed, mobile-agent systems. EMAA continues to advance the ability of mobile agents for new, more demanding applications, while making it easier for operators to configure agents and take advantage of their information collection and monitoring capabilities.

Additionally, EMAA agents are well suited for rapid application development of large integrated software systems made up of legacy, commercial-off-the-shelf, and newly developed software. The task-oriented nature of agents makes it possible to quickly construct an agent to move data and control across a collection of disparate systems.

Agents can be used anywhere there is a need for automated, persistent monitoring,

collection, and reporting of (e.g., ship movements) political events, group memberships or any other event that is reported on a network.

EMAA continues to evolve through product releases that are controlled, documented, and tested by the LM ATL EMAA Product Team in close collaboration with and in support of the EMAA user community. Recent improvements include a robust, group-based, prioritized messaging layer and a distributed registry of services and capabilities available at each EMAA node on the network.

A planned release for later this year will further expand core EMAA capabilities including: (1) visualization of accessible EMAA nodes on the

network, executing agents and message traffic between nodes, (2) implementation of market-based algorithms



**EMAA agents can monitor any event—worldwide—that results in a change in data condition, such as vessel movements, political events, group memberships, material shipments, etc.**

where agents and services can access resources intelligently through an auction-based negotiation strategy, (3) a distributed and persistent agent-based publish/subscribe with meta-data topic filtering, and (4) abstraction protocols for complex agent-agent conversations.

**For More Information:**

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