Software with Mobile Agents for Peer-to-Peer Information Sharing

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Technology Summary

Technologies like DARPA's Tactical Ground Reporting System use information sharing methods similar to Facebook, MySpace, and Twitter. Unfortunately, all of these technologies rely on centralized web service that is vulnerable to a single point of failure. To avoid potential sudden system collapse, researchers at ORNL developed a Java-based mobile agent information software called Knowledge Acquisition Ubiquitous Agent Infrastructure (KAUAI).

KAUAI supports information on demand at the site of an engagement and reduces the security risk of sending large amounts of data across a network to a central repository. The software can work with a broad suite of existing devices and has the flexibility to respond quickly to changes in tactics on the ground. These attributes are essential to the success of warfare and disaster relief efforts.

The software uses mobile agents (a computing code) for sending information from peer-to-peer. By sending computation to data instead of data to computation, KAUAI avoids transferring large amounts of raw data over the network. The software also is less reliant on network connectivity. Network connectivity is maintained only while the mobile agent is transmitting. KAUAI is configured on a shared, common software layer that the Java Virtual Machines provide, so it can be loaded onto the multiple hardware devices and operating systems that exist in the field. A software container (the KAUAI agent host) supports the mobile or static agents to initiate, execute, transport, and then terminate information transmissions.

Advantages

- Mobile, decentralized, and peer-to-peer accessible
- Increases network security
- Software development facilitates programming on a variety of devices
- Software agents speak multiple sensor communication protocols

Potential Applications

- Combat mission communication
- Disaster relief communication
- Other field environments requiring on-the-fly network communication

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