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Title: A High Performance Legacy Assimilation Pattern

Description: The NAvail Asset Lookup (Nalu) System is a Jini based framework for establishing spontaneous wide area network connections (sockets) between instrumentation networks and remote applications. It currently provides the ability to distribute a streaming multicast application over wide area networks by providing multicast-to-unicast conversion tunnels through Jini services and utilities. The Nalu Service Manager (NSM) brokers client requests by creating and managing Nalu Service Objects (NSO) according to client specifications and currently available Nalu Data Sources (NDS). Once the client downloads the proxy and connects to the data source through the tunnel, they communicate directly over sockets, just as they would on a LAN without using Jini. This approach enables rapid prototyping of distributed legacy applications without additional performance overhead. The Jini framework provides a very rich object and pattern model for meta connection information and does not interfere with the real time performance of the distributed application. The Nalu system extends the Jini framework to provide these tunnels through NSO and NSM proxies.

An NSM is a Jini (service) entity that has a service proxy which contains a Tunnel instance. NSM uses a JoinManager instance to register its service proxy with lookup services. The initial version of NSM uses administrator inputs to create, delete, and configure NSOs. NSM will eventually use admin inputs and more autonomous methods to manage NSOs.

An NSO is a Jini entity that has a Tunnel and service proxy that contains the Tunnel instance. It uses the JoinManager to register its NSO service proxy with lookup services. NSOs currently know how to convert multicast/unicast data streams and provide hooks for intermediate data processing on the streams.

NDS is a Jini (client) entity that uses the ServiceDiscoveryManager to obtain an NSM proxy which provides a Tunnel for connecting to a particular data source.

This architecture provides a "Legacy Assimilation Pattern" that enables real time applications designed to run on LANs to share data and cooperate over WANs.

Nalu is completely written in Jini/Java and can support a wide variety of legacy applications as well as new applications. It currently supports connections between the ReadInet data source application and the SIMDIS 2D and 3D visualization application. ReadInet provides multicast data from the Instrumentation network (Inet) at the Pacific Missile Range Facility (PMRF) on the island of Kauai. The SIMDIS application accepts multicast data through Tunnels provided by Nalu and can be run anywhere on the internet.

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