# jGMA: A reference implementation of the Grid Monitoring Architecture

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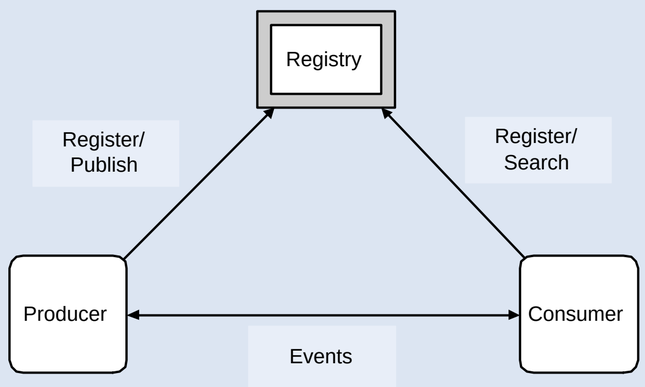
## Introduction

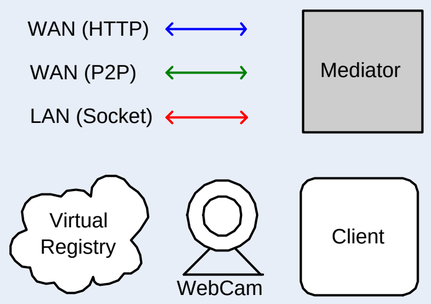
jGMA is a Java-based wide-area message passing framework designed to be a reference implementation of the GGF's Grid Monitoring Architecture. jGMA clients require a scalable, fault tolerant mechanism for joining and querying the distributed network; the so called jGMA Virtual Registry. The poster outlines the current jGMA architecture, the current research focus is the jGMA Virtual Registry; and how we intend to use P2P technologies to provide the required functionality.

The GMA supports a publish/subscribe and query/response model. In jGMA the Registry component (which provides the services for producers and consumers to discover each other) is wrapped within a "Mediator" which provides extra functionality that permit and allow remote communications for clients which are behind firewalls.

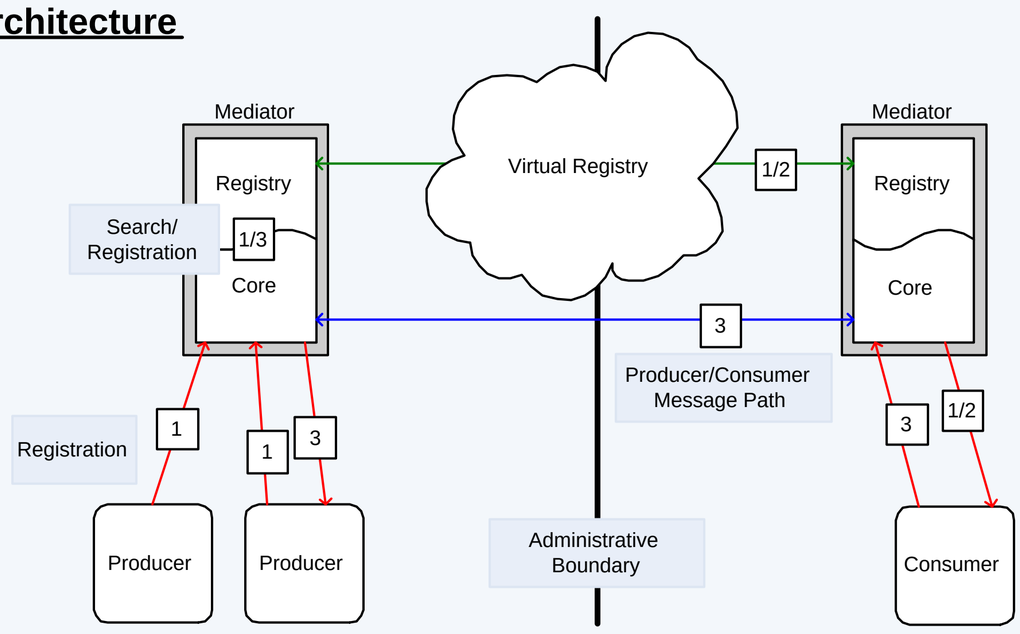



The Grid Monitoring Architecture

**Poster Key**




## Architecture




An example jGMA deployment between two administrative domains connected via the Internet. The following steps occur when a jGMA consumer attempts to interact with one or more producers:

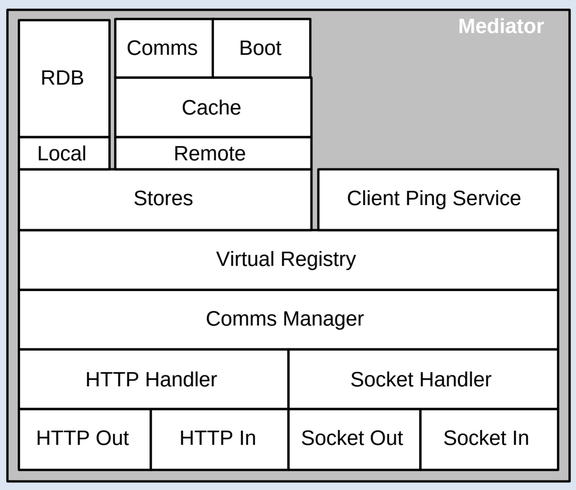
1. The producer and consumer register with the registry
2. The consumer queries the registry for a producer service
3. Consumer/producer communications

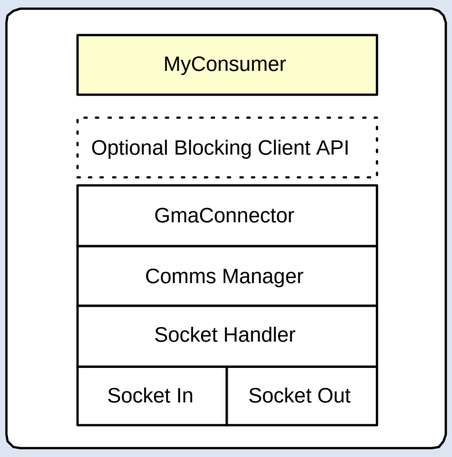
## API

The Mediator API is used internally by jGMA. The VR provides functionality for naming new clients, discovering other mediators and searching for information about other producers and consumers.

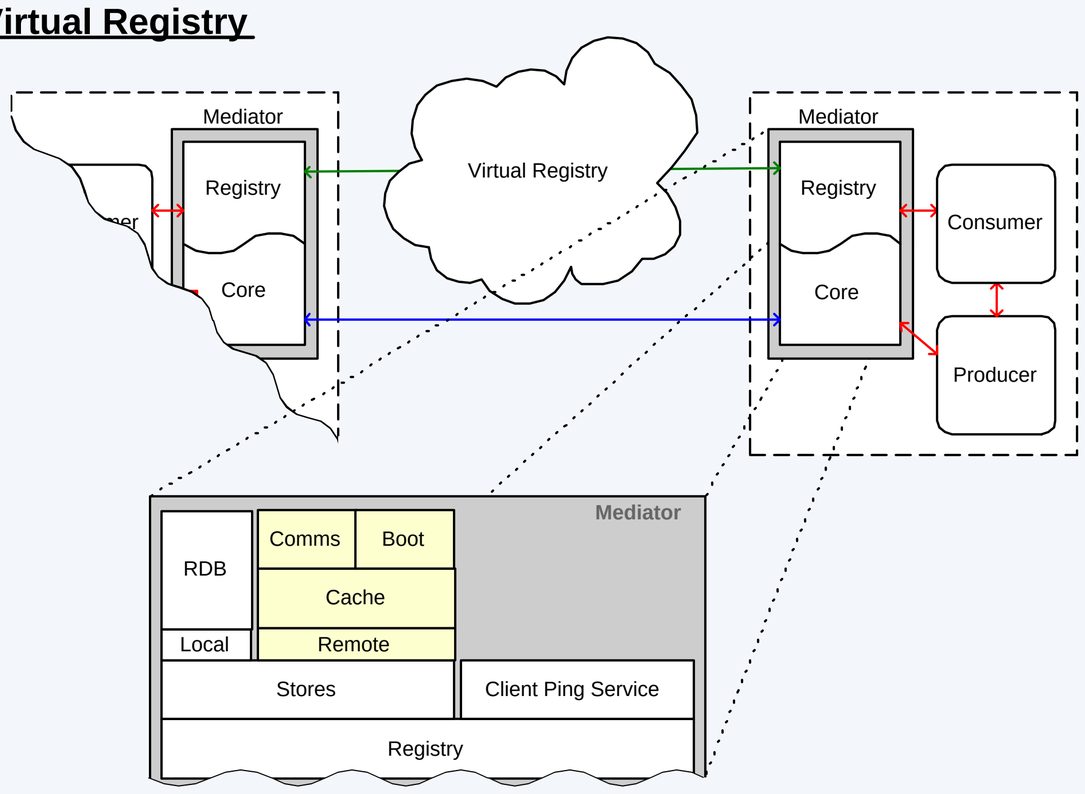
Producers and consumers are developed using the Client API that contains fourteen method calls. Using more than one producer and consumer enables more complex clients to be created.

Abstract interfaces make the API easy to extend, for example adding HTTPS or SOAP would just require adding a new handler capable of receiving and sending their messages.

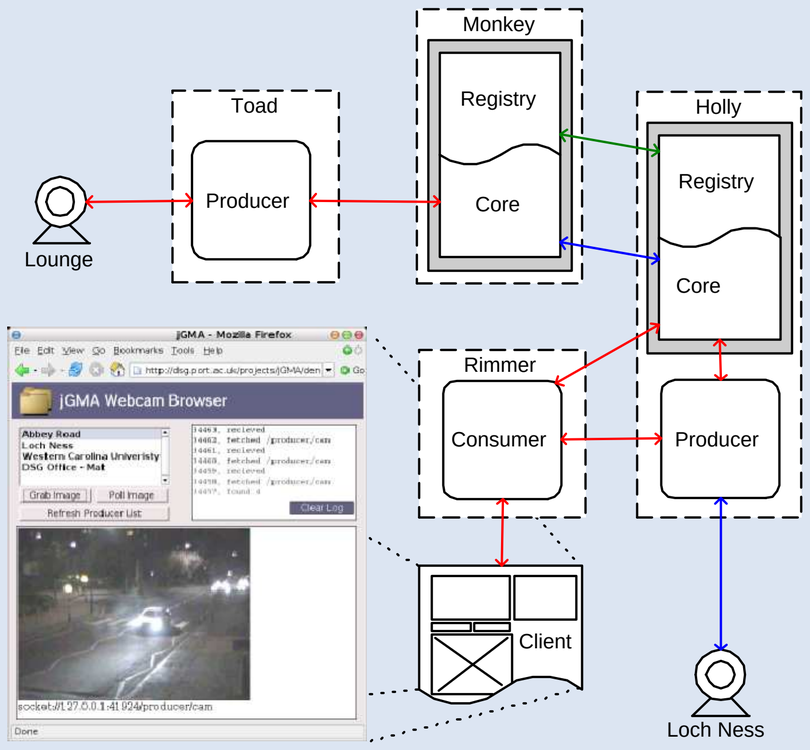



## Virtual Registry




The pluggable Peer-to-Peer API of the Virtual Registry.
A set of generic services are provided to implement the three core services of the VR:
**service discovery** **Boot** **, querying** **Comms** **, and caching** **Cache** .
We can plug other software into the VR to provide interoperability with other systems.




http://dsg.port.ac.uk/projects/jGMA/demos/

## Demo

A live demonstration of jGMA is available online. The demo provides an interactive graphical interface (using a Web browser) to consumers and producers executing within the jGMA framework. Producers fetch images from web-cams and Consumers can discover and display these images.

## Summary and Future Work

We have outlined the design for a pluggable registry framework for jGMA, which will allow us to explore how best to leverage existing P2P technologies to create a scalable, robust Virtual Registry. We currently support SQL as a query language and LDIF as a response mark up. The VR has a layer of abstraction to permit interoperability with other GMA implementations in the future.

In order to demonstrate the capabilities of the jGMA framework we intend to develop a library for online distributed gaming. Games publishers have each tried to provide an infrastructure to support their online games. We believe there is an opportunity to develop standard services, based on a jGMA, to support these games.

An early binary version of jGMA is currently available for developers interested in investigating and further enhancing its capabilities.

DSG Homepage: http://dsg.port.ac.uk/
Project Website: http://dsg.port.ac.uk/projects/jGMA/
Download: http://dsg.port.ac.uk/projects/jGMA/software/
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