An Approach using the Data Distribution Service as the Connecting Transport for 100X Joint Battlespace Infosphere Servers

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Introduction

The Joint Battlespace Infosphere (JBI)
- Is an information management system which allows users to dynamically provide, discover, and exchange information (OIM)

Motivation
- To improve the Quality of Service (QoS) provided by the JBI platform

Proposed: the integration of the JBI with the Data Distribution Service (DDS)
- Leveraging the capabilities of DDS, a QoS-aware publish-subscribe middleware
Original Proposed Scheme

- Employing DDS within the servers
  - Completely transparent to the clients
- Requiring mapping of JBI data (XML) to DDS data (binary)
- Producing
  - Bandwidth savings
  - Performance (parsing speed) improvement
  - Better scalability, QoS
  - Associated challenges as well
Original Proposed Scheme

Parallel Pipelined Model

- Authorization Credentials
- Publish Requests
- Subscribe Requests

Connector Manager → Connection Info/Peer List

Publisher Catcher m → Publisher Catcher 2

Publisher Catcher 1

Ingress Publication From HPCs or Client

All pubs received

Next Available

Broker 1
Broker 2
Broker n

If pubs received

Connector (Broadcast)

Disseminator 1
Disseminator 2
Disseminator k

Deliver Publication to Client

m: # of publication receivers, most likely = 1
n: # of independent “all-purpose” brokers
k: # of publication deliverers
DDS/JBI Connector Integration

- Demonstrated prototype of limited integration for inter-server communication
- JBI uses “connectors” between multiple servers
We leverage DDS
Showed possibilities for QoS improvement

- History, Durability, Liveliness, Reliability, Resource Limits, etc.

Experiments highlighted

- Limitations in how QoS information can be communicated back to the JBI
- Need for greater consideration of QoS throughout the JBI
Thank You!

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QoS Policy Dependencies

Teal color denotes partial/full support under current version of TAO/DDS.
QoS Policy Dependencies (2)

Teal color denotes partial/full support under current version of TAO/DDS; red denotes additional QoS highlighted for use in the RI.