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

Lei Zhao
Dr. Douglas Blough
Dr. Vincent J. Mooney III
Justin Fiore

School of Electrical and Computer Engineering
and College of Computing

Georgia Institute of Technology,
Atlanta, GA, USA

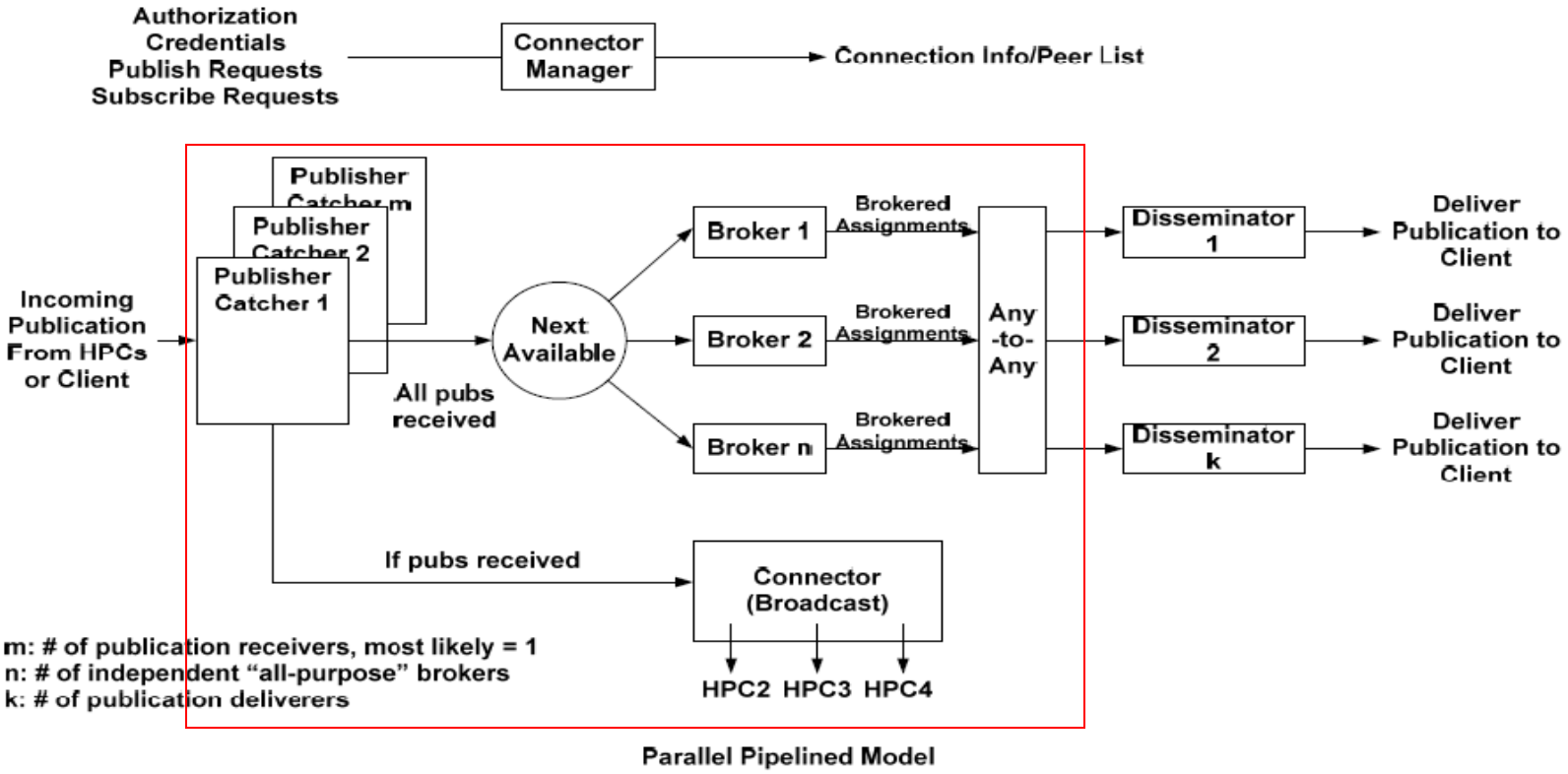
Introduction

- 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

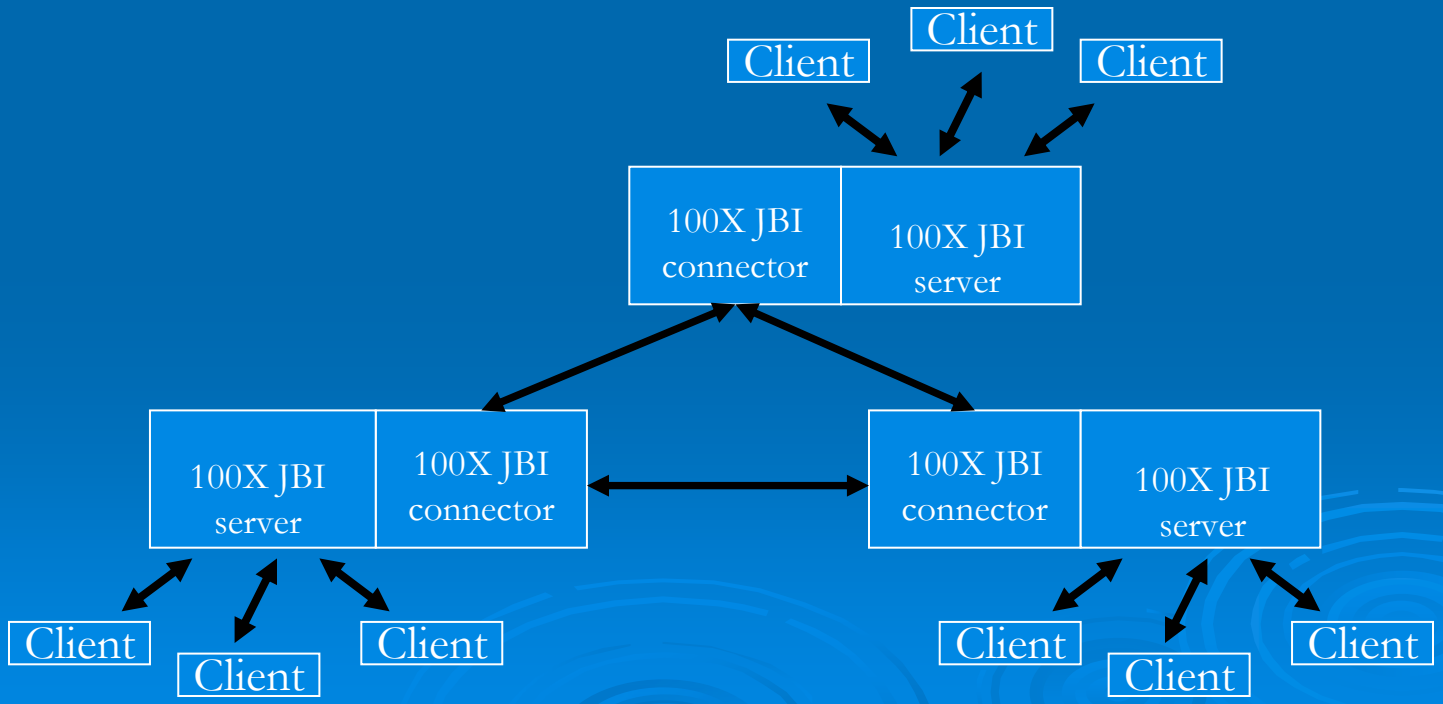
Original Proposed Scheme



Parallel Pipelined Model

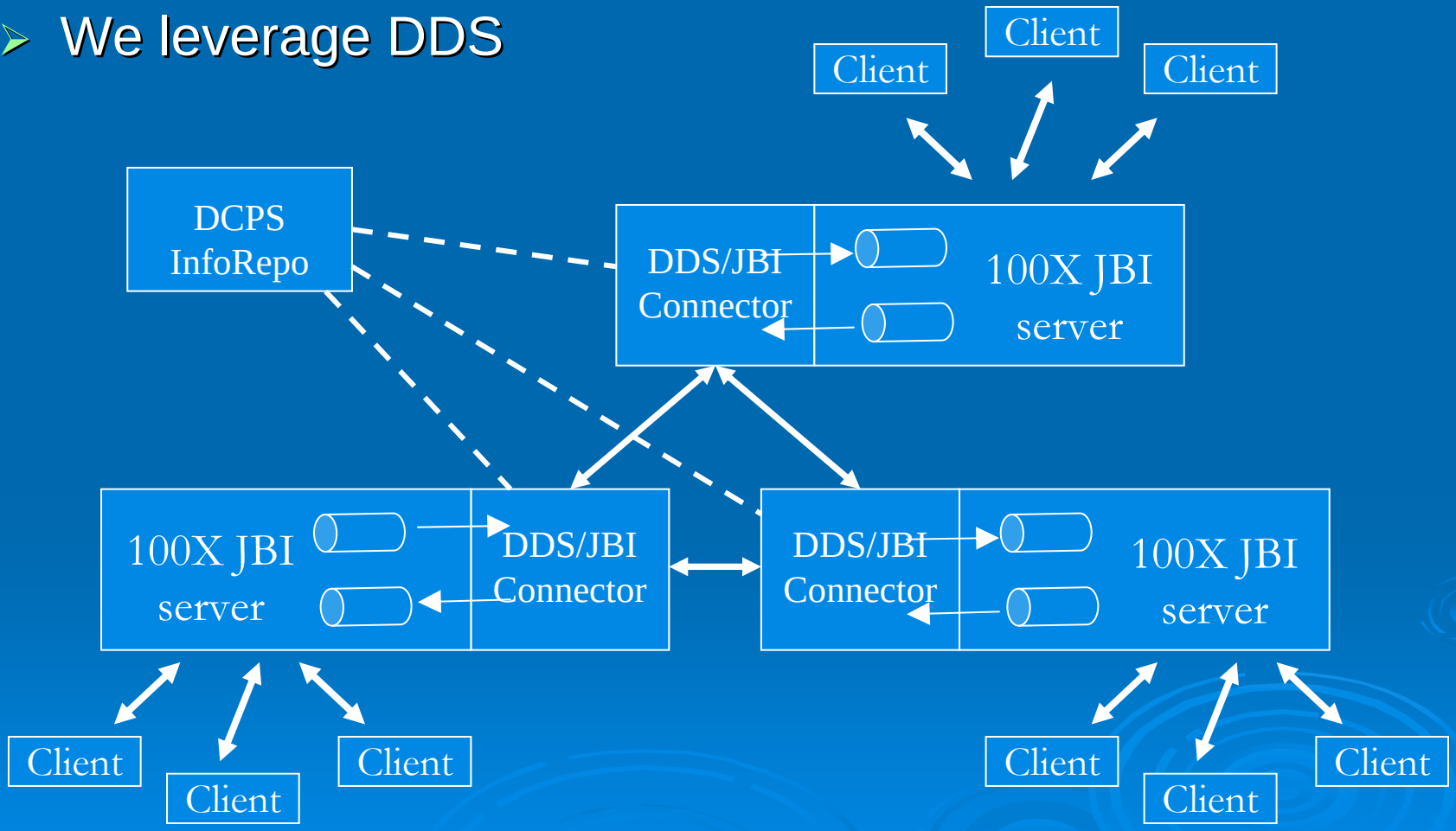
DDS/JBI Connector Integration

- Demonstrated prototype of limited integration for inter-server communication
- JBI uses “connectors” between multiple servers



DDS/JBI Connector Integration

- We leverage DDS



DDS/JBI Connector Integration

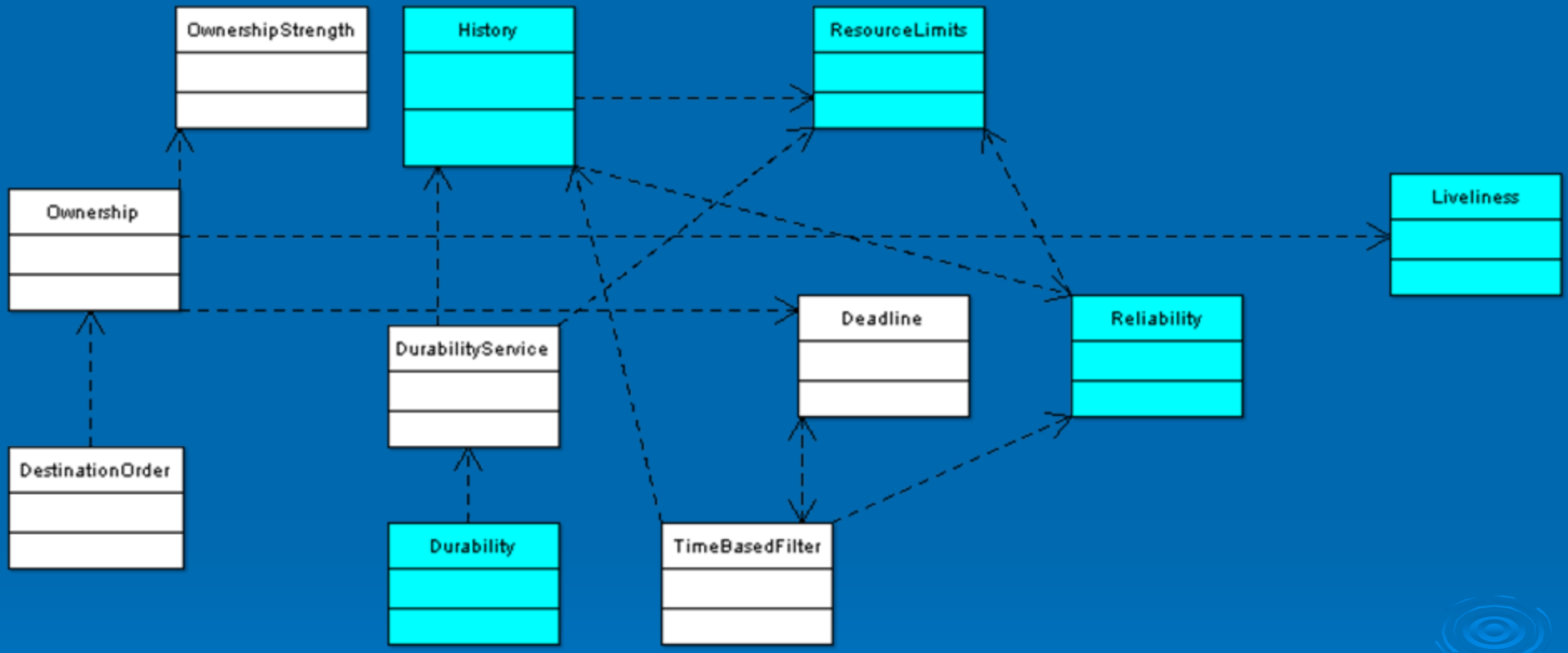
- Showed possibilities for QoS improvement
  - History, Durability, Liveliness, Reliability, Resource Limits, etc.
- Experiments highlighted
  - Limitations in how QoS information can be communicated back to the JBI
  - Need for greater consideration of QoS throughout the JBI

Thank You!

Lei Zhao - lei.zhao@gatech.edu
Dr. Douglas Blough - dblough@ece.gatech.edu
Dr. Vincent J. Mooney III - mooney@ece.gatech.edu
Justin Fiore - justin.fiore@gatech.edu

Sponsored by **AFRL** and the U.S. Air Force Summer Faculty Fellowship Program (**SFFP**)

QoS Policy Dependencies



LatencyBudget	Lifespan	TransportPriority	Presentation	ReaderDataLifecycle	WriterDataLifecycle	Partition	EntityFactory

UserData	TopicData	GroupData

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.