



# Data Movement Mechanisms

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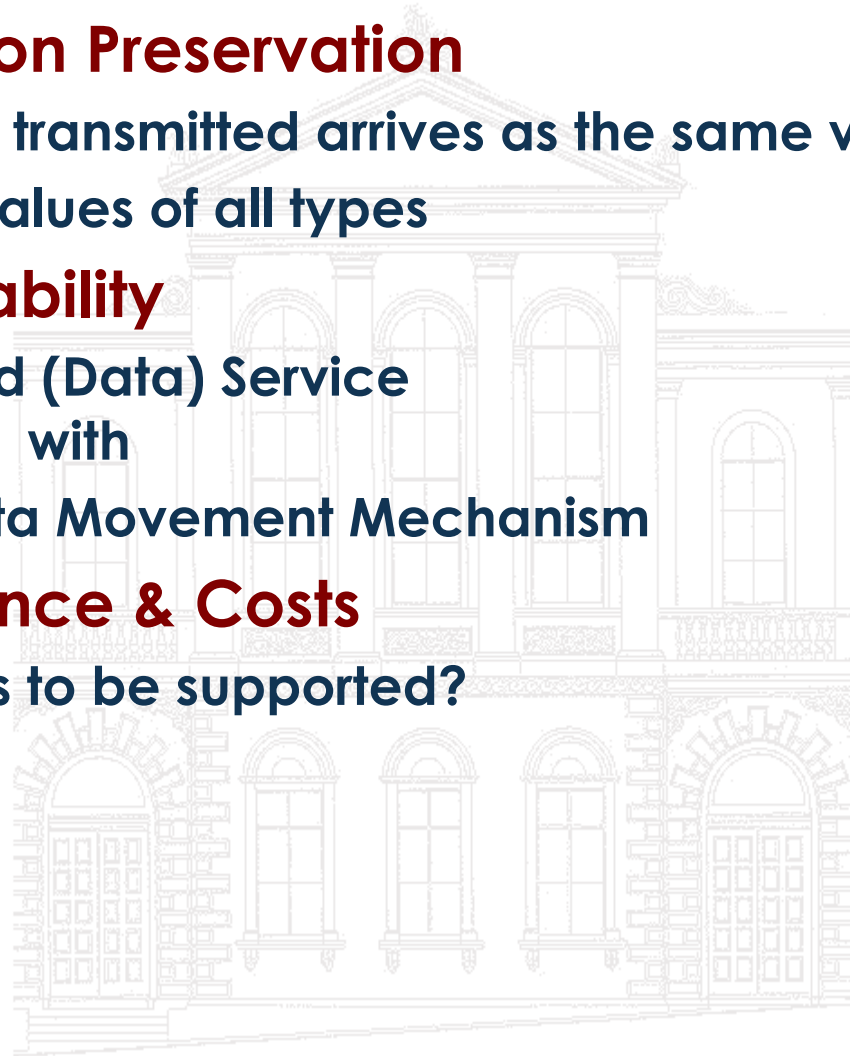
**IBM Almaden Research Centre**  
**DAIS WG Face-to-Face**

# Motivation

- **Results of no value**
    - If not delivered to a consumer
  - **Updates**
    - Need supplied values
  - **These may be large!**
  - **Supplier and Consumer(s)**
    - Same process or different processes
    - Same machine or same cluster
    - Same LAN or Wide Area hop
    - Same architecture, hosting environment or different
- 
- **Are messages transmitted from triggers always small?**
  - **Are they in or out of scope?**

# Requirements

- **Information Preservation**
  - A value transmitted arrives as the same value
  - For all values of all types
- **Composability**
  - Any Grid (Data) Service with
  - Any Data Movement Mechanism
- **Performance & Costs**
  - Choices to be supported?

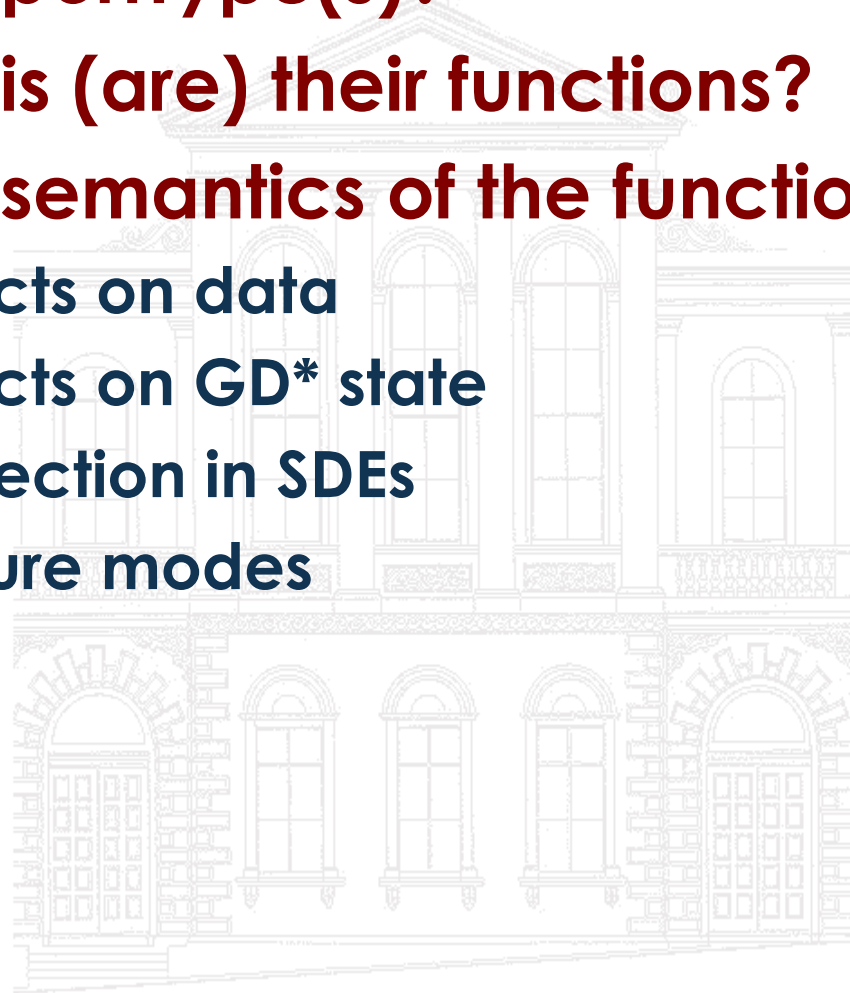


# Requirements 2

- **Integration**
  - Available between all services
  - Available for all Information
    - ▶ Data, Code, Processes, State
  - **DAIS-WG current focus is Information**
    - ▶ Higher-level view of data
    - ▶ but future proof?
- **Control**
  - What is moved (Query result | DB | File | set of (files | results), ...)
  - Where From & To\* (Notation in Request document?)
  - What units of transfer (Logical | Physical)
  - What synchronisation (and lifetime)
  - Privacy, e.g. Encryption
  - Dynamic selectivity & Flow control
  - What compression / encoding
  - What transformations en route
  - What monitoring mechanisms

# Fundamental Issues

- **What portType(s)?**
- **What is (are) their functions?**
- **What semantics of the functions?**
  - **Effects on data**
  - **Effects on GD\* state**
  - **Reflection in SDEs**
  - **Failure modes**



# Desiderata

- **Algebra of operations**
  - $B = \text{Move}(A); C = \text{Move}(B)$
  - $x = F(A), y = F(B) \Rightarrow x = y$
- **Factories & Movement: Retained Relationships**
  - Create a GD\* service from A
  - Create a GD\* service from A @ another loc
    - ▶ (Define) Shared state
    - ▶ Copied state
    - ▶ Mechanisms for copied state coherence
    - ▶ How up-to-date?
    - ▶ How is change propagated?
- **Retained relationships & Coherence mechanisms not currently in scope of DAIS standard?**