



# RTI Performance Testing

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# RTI Performance Testing

- **Perform application independent scalability tests with RTI 1.3v3 distribution using modified benchmark programs**
- **Define and perform application specific RTI performance tests for selected representative applications**

# **Basic Application Independent Scalability Tests with RTI 1.3 V3**

## **Overall Goal:**

- **Calculate and understand performance along these key axis**
  - **Number of federates**
  - **Number of objects / federate**
  - **Attributes characteristics**
    - **Number / object**
    - **Size**
    - **Number published and subscribed to**
    - **Attribute depth in class**
  - **Transport type (bundling and no bundling)**
  - **Time advance requests**
  - **DDM operations**

# Initial Test: Baseline Scalability

- Use 2 throughput benchmark federates
- 1 federate sending, 1 receiving
- Only publish and subscribe to necessary attributes
- Flat class hierarchy
- Baseline tests:
  1. Increase number objects/federate
    - 1 100 byte attribute / object
  2. Increase attribute size starting with 4 byte attribute
    - 1 object / federate with 1 attribute / object
- Record throughput as `updateAttributeValue` calls / sec and number of Reflections / sec

# **Initial Test: Baseline Federation Scalability**

- **Use 16 Intel Solaris Platforms (N1-N16)**
- **Run throughput and time advance benchmarks**
- **N federates sending, N receiving**
- **1 object / federate**
- **1 200 byte attribute / object updated**
- **Flat hierarchy**
- **Best effort and reliable**
- **Baseline tests:**
  1. **N1 through N16**

# Scalability Test

- **Evaluate baseline results and determine next tests**
- **Depending on results, select:**
  - **4 object / federate values**
  - **4 attribute sizes**
  - **4 number of attributes / object**
  - **4 flat class hierarchy sizes**
  - **4 class hierarchy depths**
  - **best effort and reliable**
- **Repeat N2, N4, N8, and N16 for each selected**

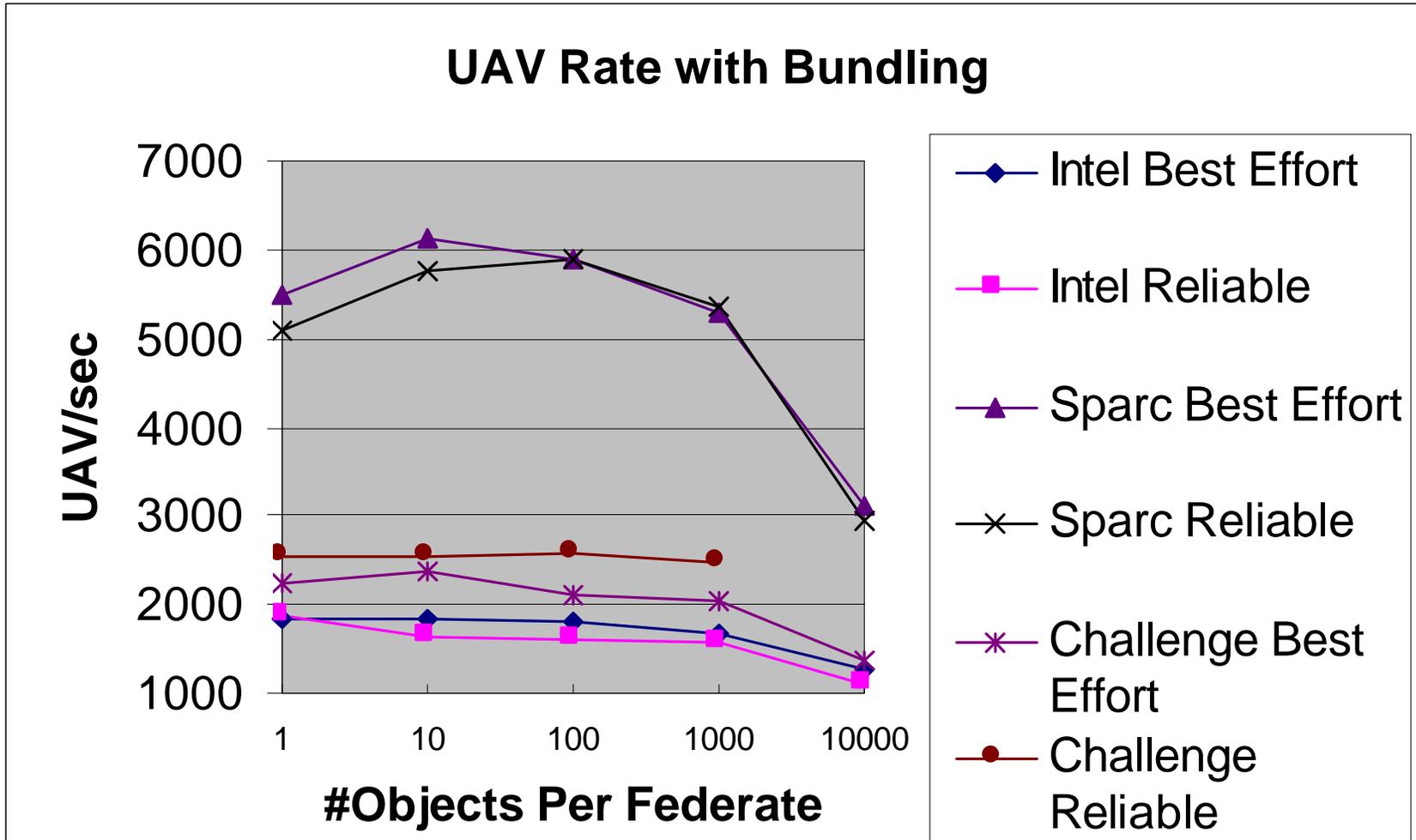
# Application Specific RTI Performance Testing

- Define performance needs of DoD user communities and profile RTI 1.3 with respect to the needs
  - FEPWs define typical range of federation execution
  - RDE Forum use cases
  - Define performance needs in terms of benchmarks

## **Tests included for Fall SIW**

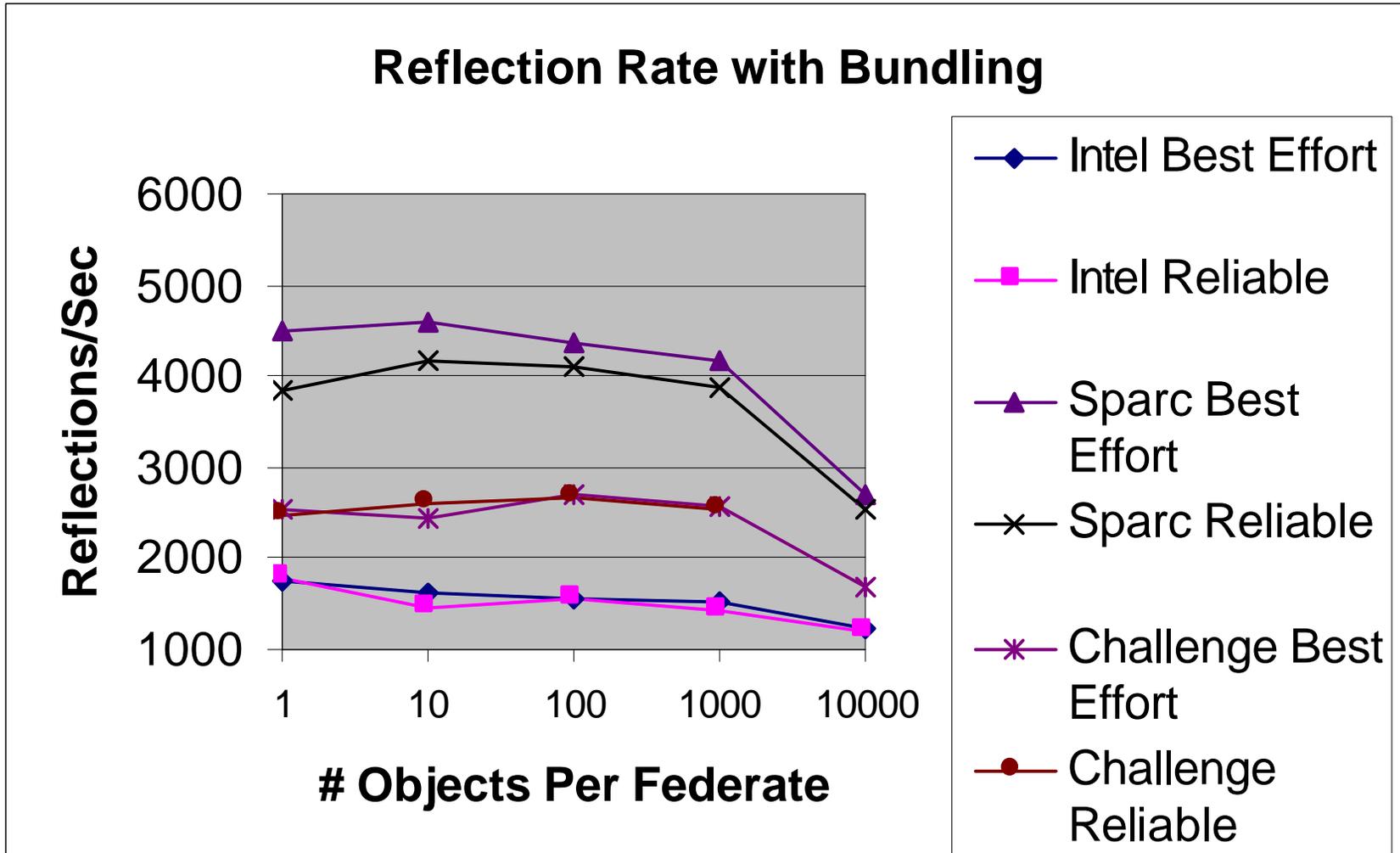
- **Baseline Scalability**
- **Baseline Federation Scalability**

# Baseline Scalability Results



Flat Class Hierarchy      2 benchmark federates (1 sending, 1 receiving)  
One 100 byte attribute/object

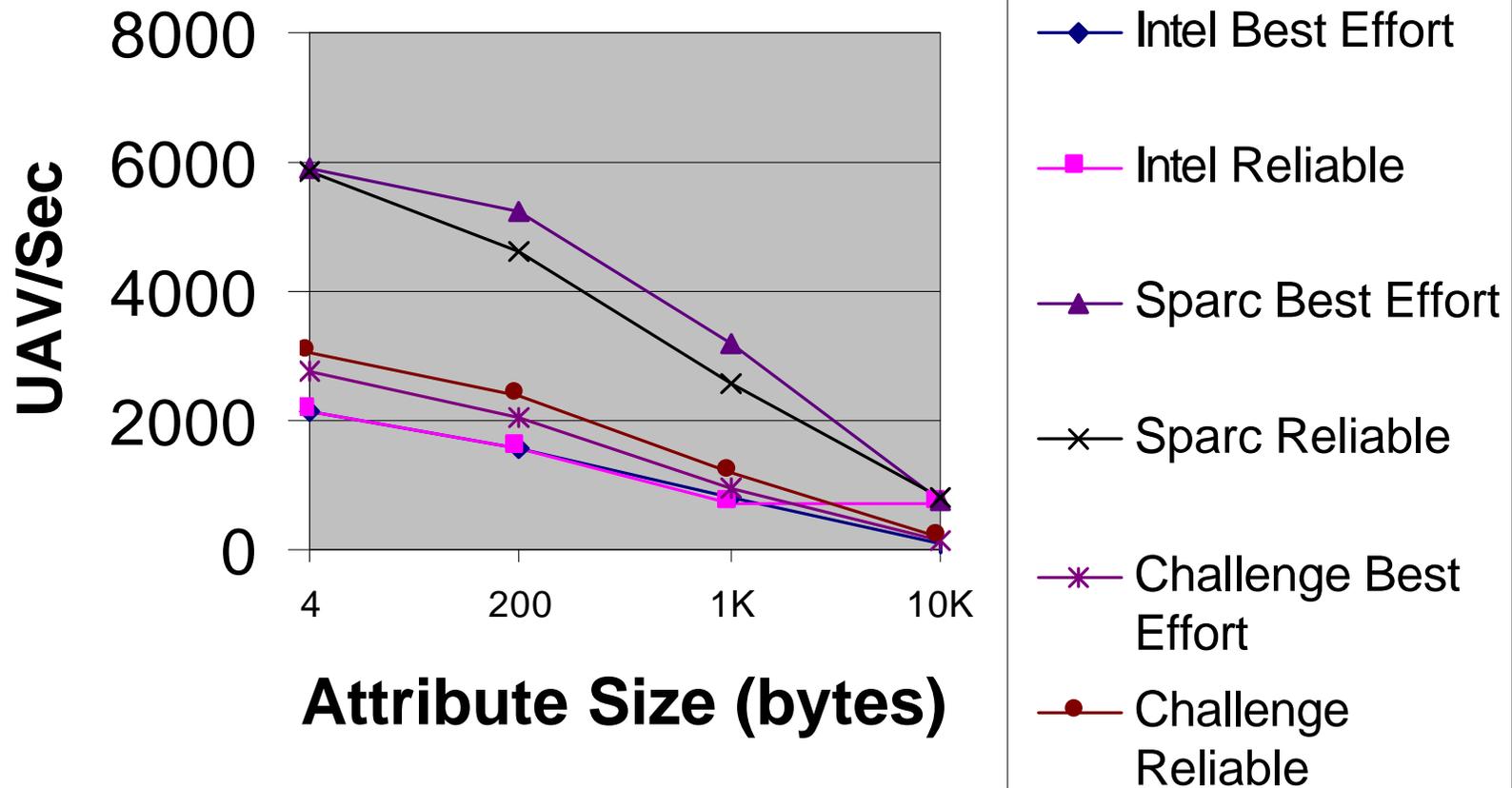
# Baseline Scalability Results



Flat Class Hierarchy      2 benchmark federates (1 receiving , 1 sending)  
One 100 byte attribute/object

# Baseline Scalability Results

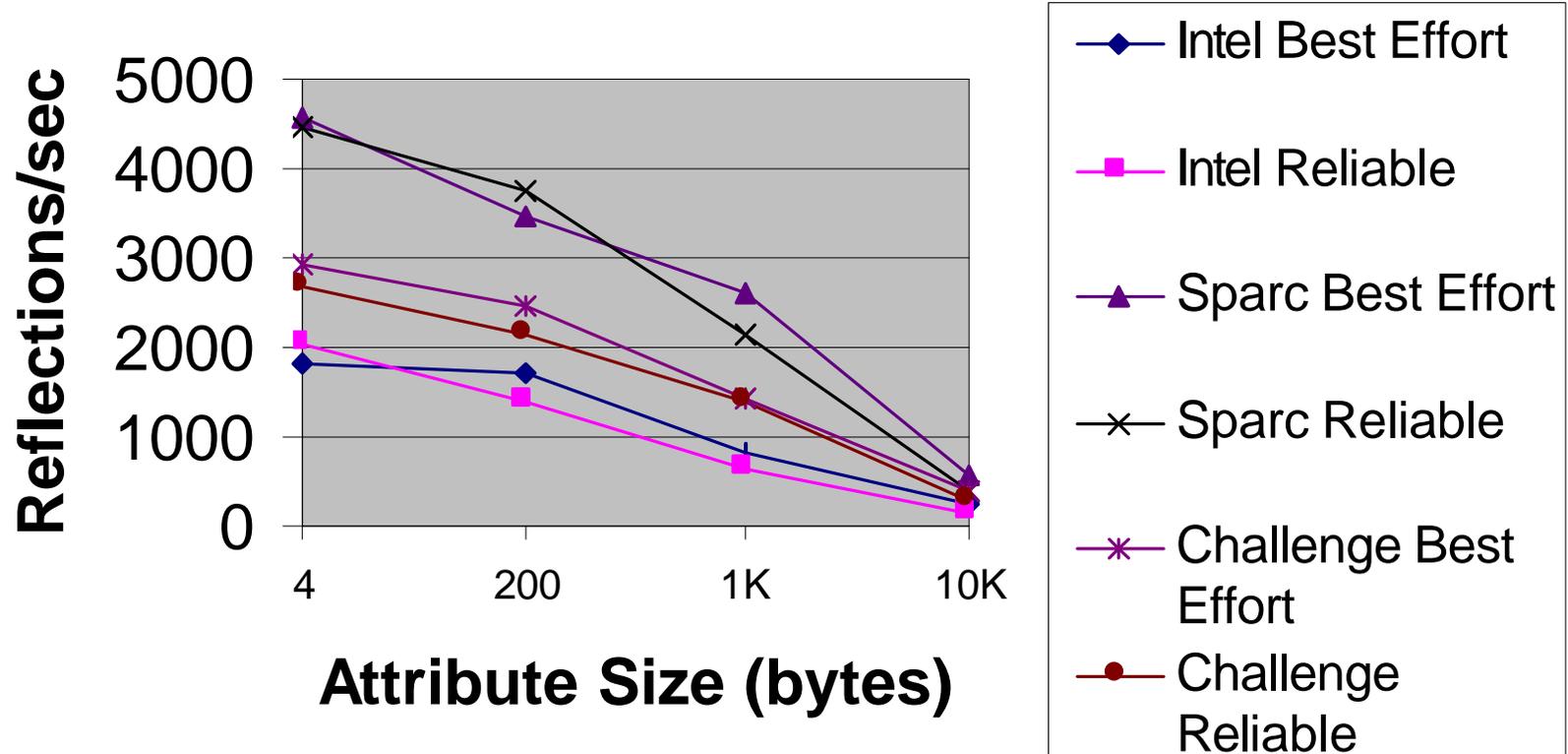
## UAV Rate with Bundling



Flat Class Hierarchy      2 benchmark federates (1 sending, 1 receiving)  
1 object/federate with 1 attribute/object

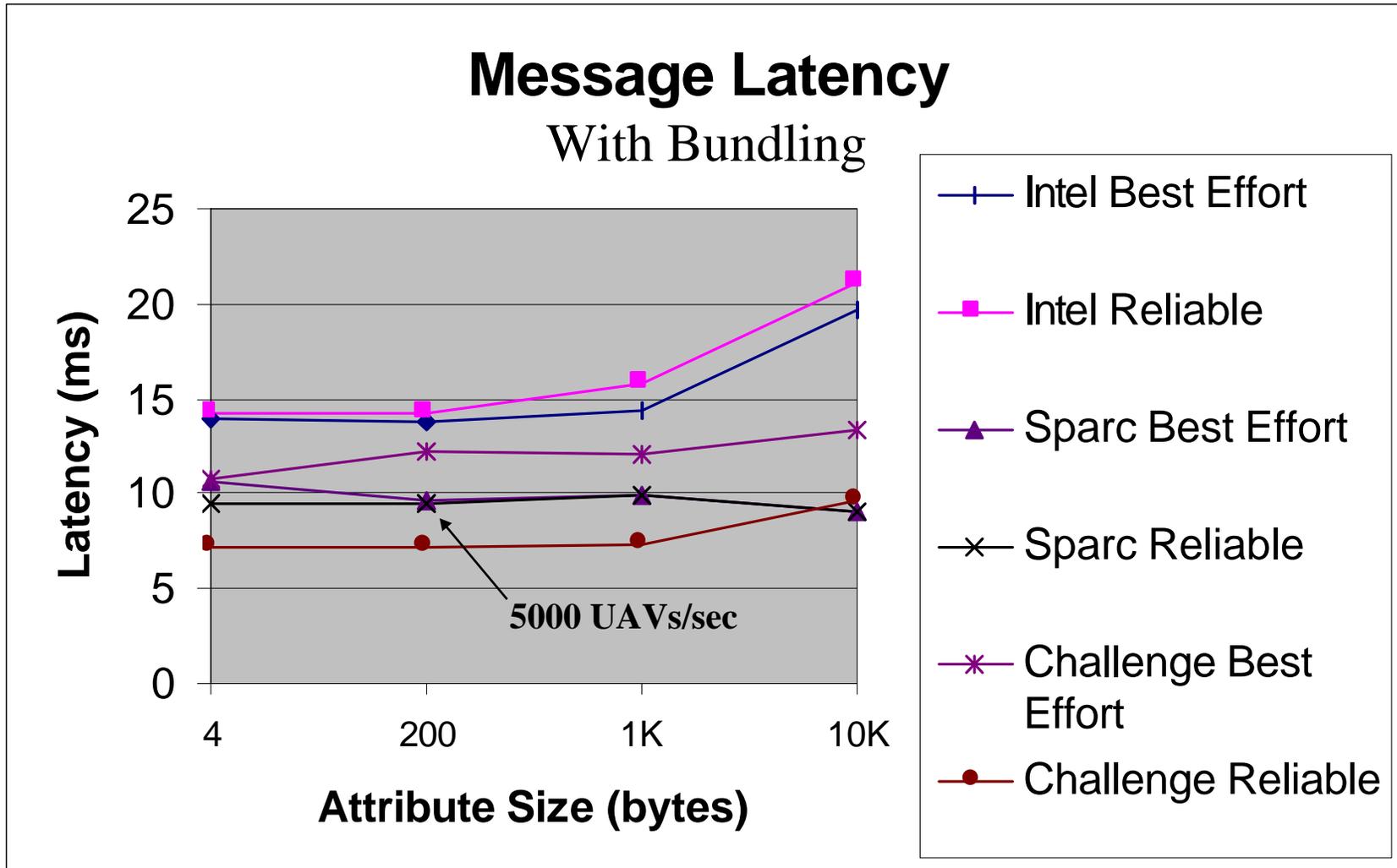
# Baseline Scalability Results

## Reflection Rate with Bundling



Flat Class Hierarchy      2 benchmark federates (1 receiving , 1 sending)  
1 object/federate with 1 attribute/object

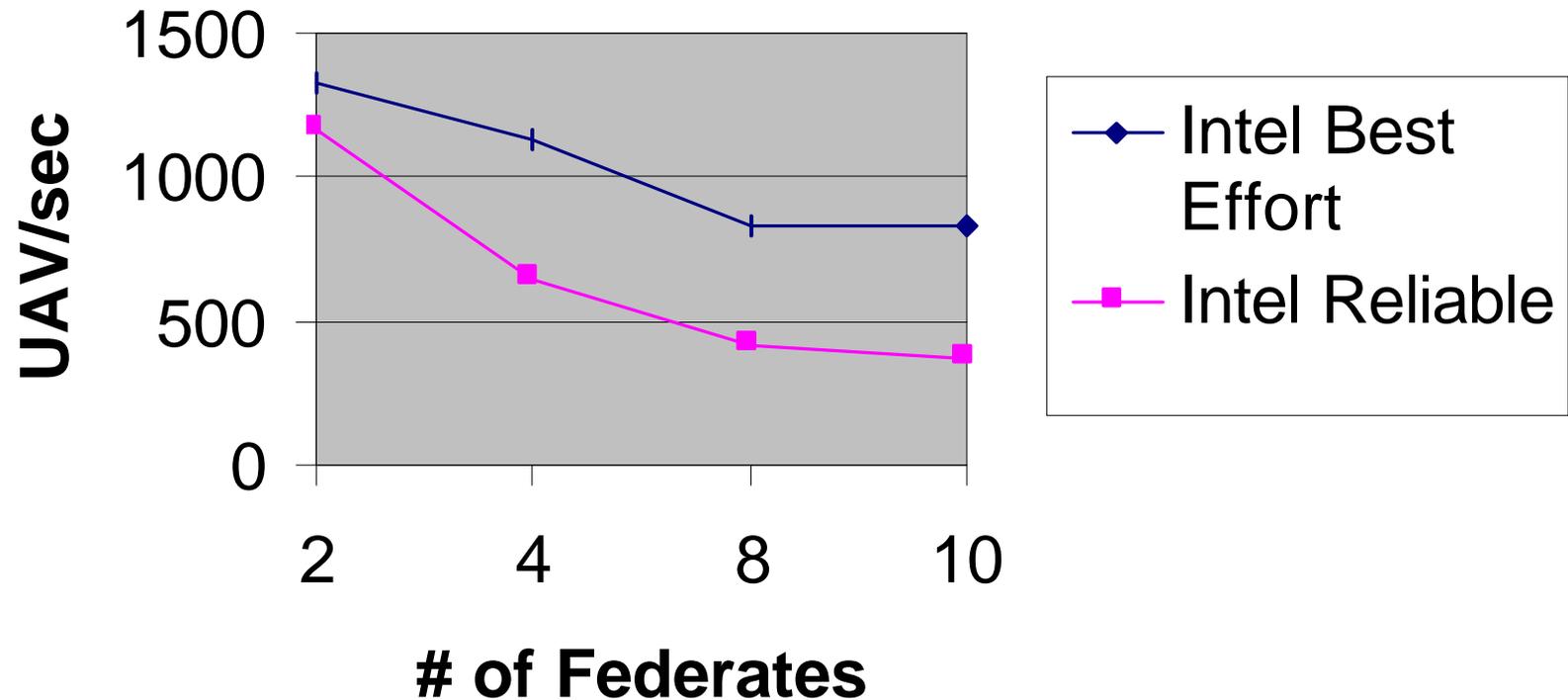
# Baseline Scalability Results



Flat Class Hierarchy      2 benchmark federates (1 receiving , 1 sending)  
1 object/federate with 1 attribute/object

## Baseline Federation Scalability Results

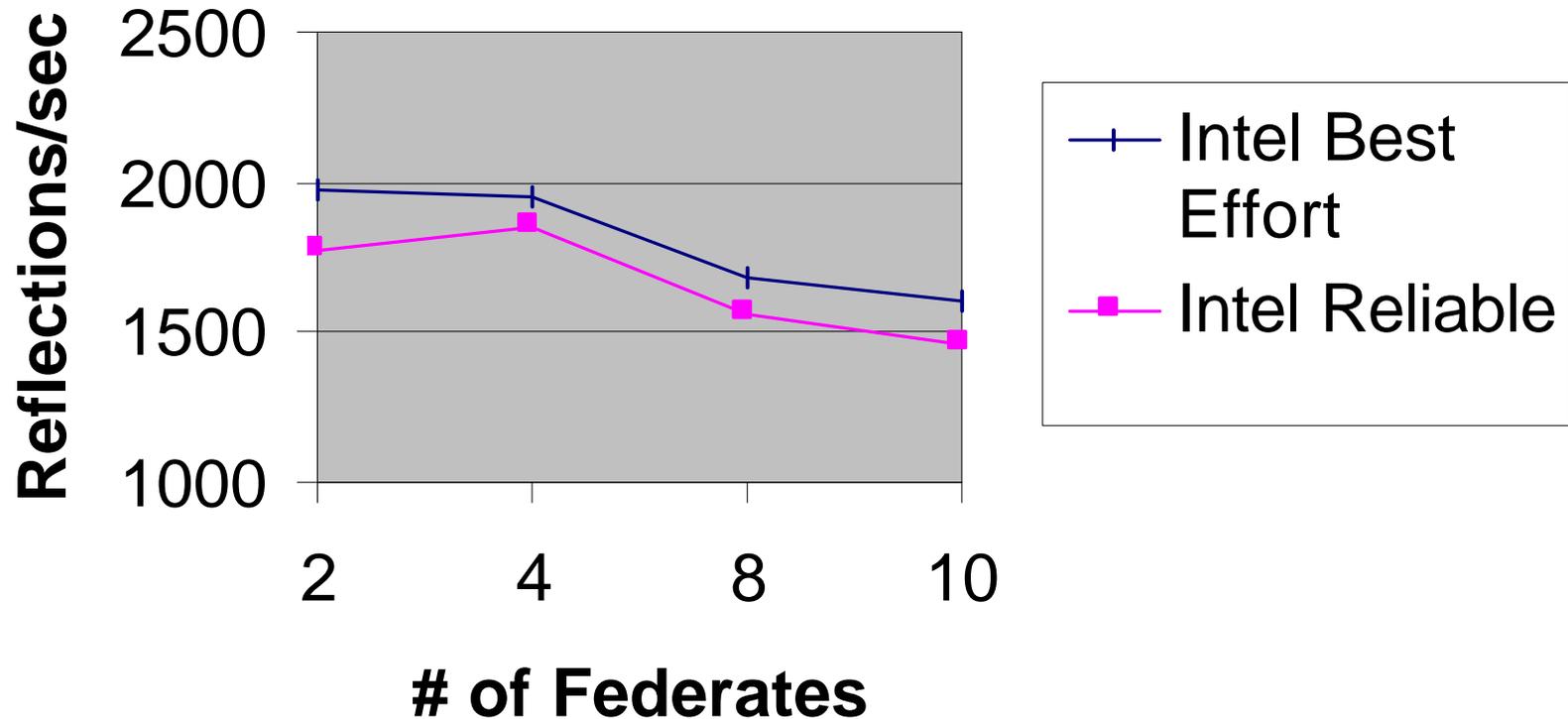
### UAV Rate with Bundling



1 object with one 200 byte attribute  
Each Federate publishes and subscribes

## Baseline Federation Scalability Results

### Reflection Rate with Bundling



1 object with one 200 byte attribute

Each Federate publishes and subscribes