



# RTI Performance Testing

**Russ Richardson**

**Roger Wuerfel**

**SAIC**

**28 September, 1998**

# REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188



| 1. REPORT DATE (DD-MM-YYYY) | 2. REPORT TYPE | 3. DATES COVERED (FROM - TO) |
|---|---|---|
| 28-09-1998 | Briefing | xx-xx-1998 to xx-xx-1998 |

4. TITLE AND SUBTITLE
RTI Performance Testing
Unclassified

5a. CONTRACT NUMBER
5b. GRANT NUMBER
5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Richardson, Russ ;
Wuerfel, Roger ;

5d. PROJECT NUMBER
5e. TASK NUMBER
5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME AND ADDRESS
SAIC
xxxxx, xxxxxxx

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS
United States Department of Defense
Defense Modeling and Simulation Office
1901 N. Beauregard St., Suite 500
Alexandria, VA22311-1705

10. SPONSOR/MONITOR'S ACRONYM(S)
11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
APUBLIC RELEASE
,

13. SUPPLEMENTARY NOTES

14. ABSTRACT
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

15. SUBJECT TERMS

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT | b. ABSTRACT | c. THIS PAGE | Public Release | 15 | Fenster, Lynn<br>lfenster@dtic.mil |
| Unclassified | Unclassified | Unclassified | | | 19b. TELEPHONE NUMBER<br>International Area Code<br>Area Code Telephone Number<br>703767-9007<br>DSN<br>427-9007 |

# 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

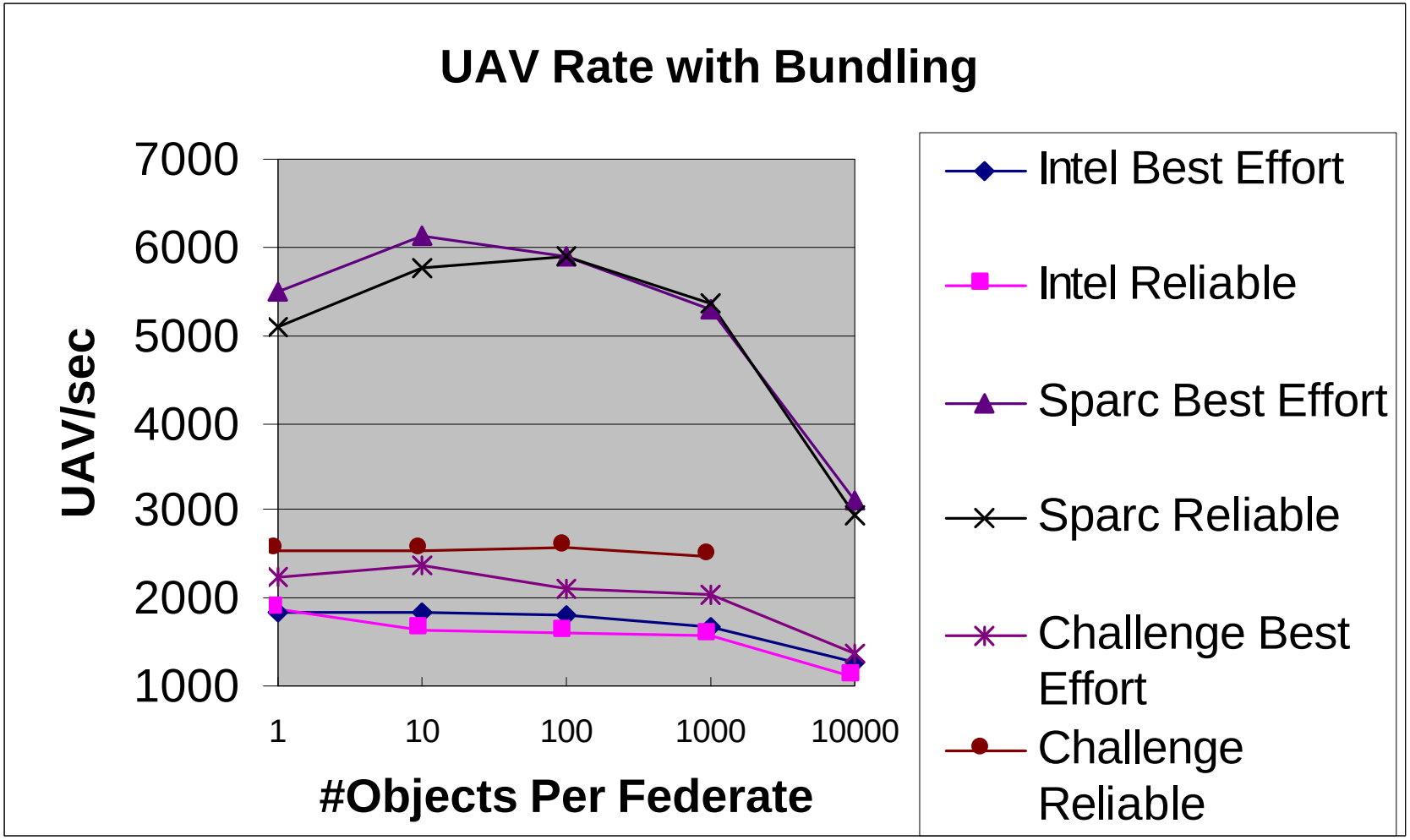
# Application Specific RTI Performance Testing

- 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

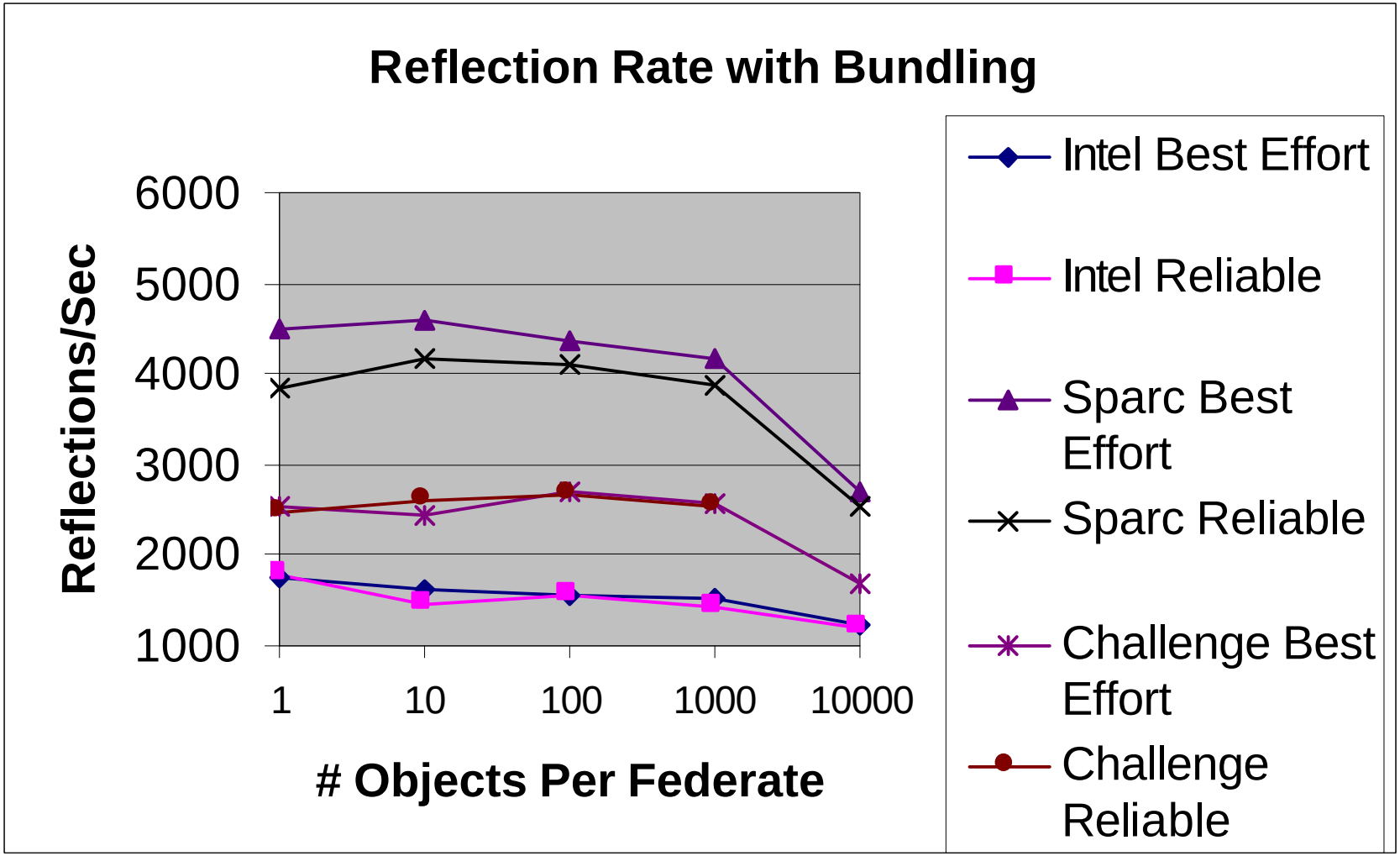
- **Baseline Scalability**
- **Baseline Federation Scalability**

# Baseline Scalability Results



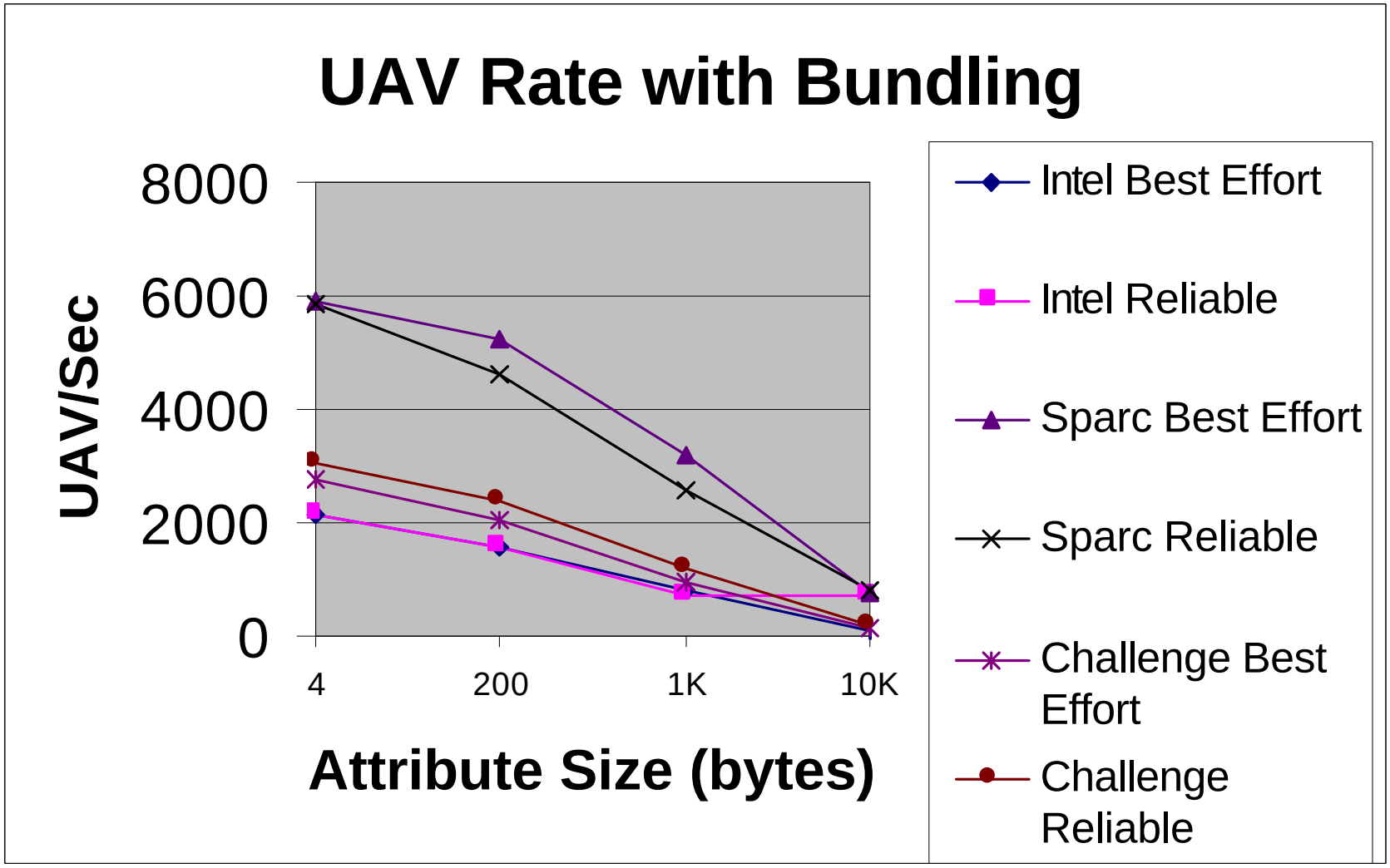

Flat Class Hierarchy  2 benchmark federates (1 sending, 1 receiving)
One 100 byte attribute/object

# Baseline Scalability Results



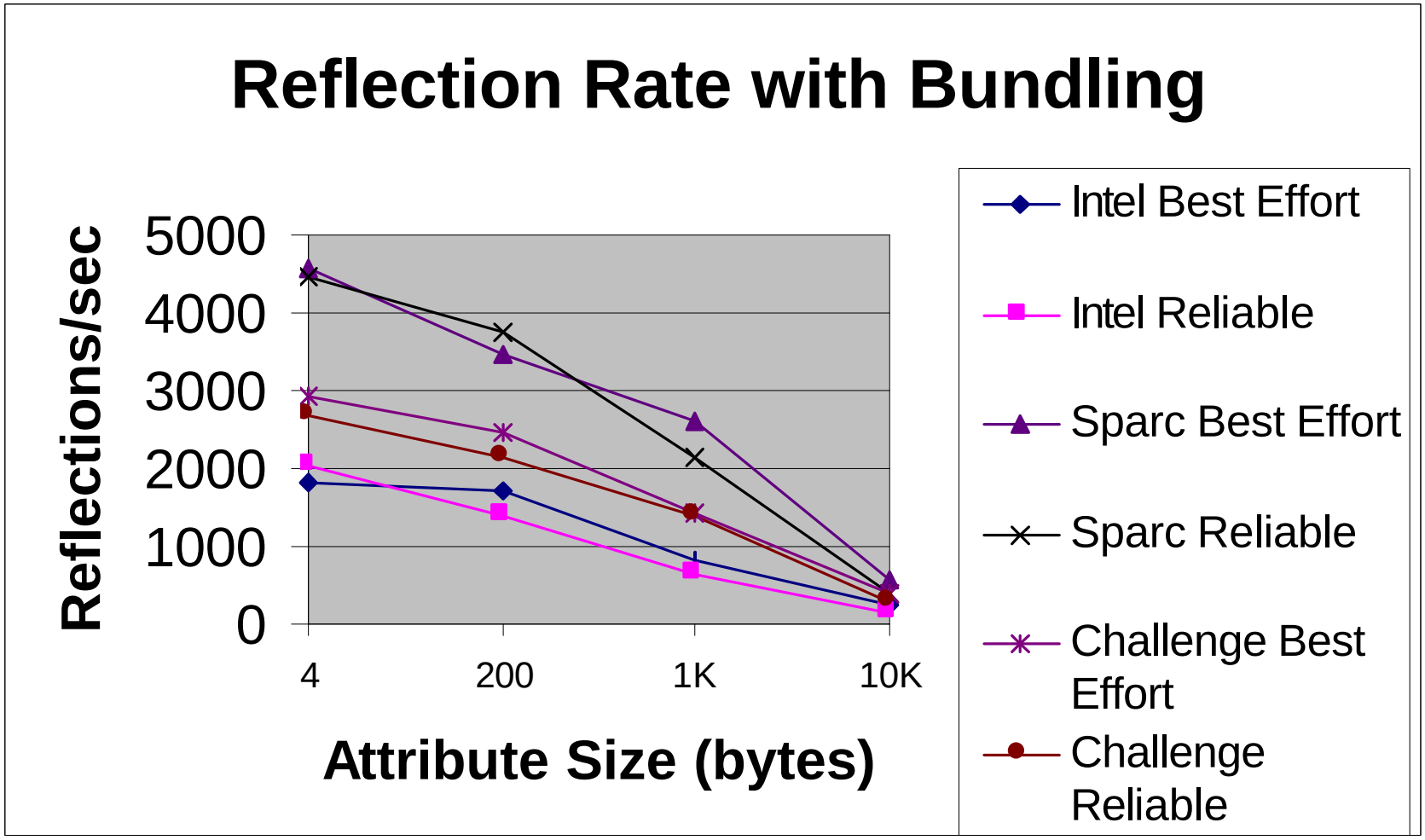

Flat Class Hierarchy 2 benchmark federates (1 receiving , 1 sending)
One 100 byte attribute/object

# Baseline Scalability Results



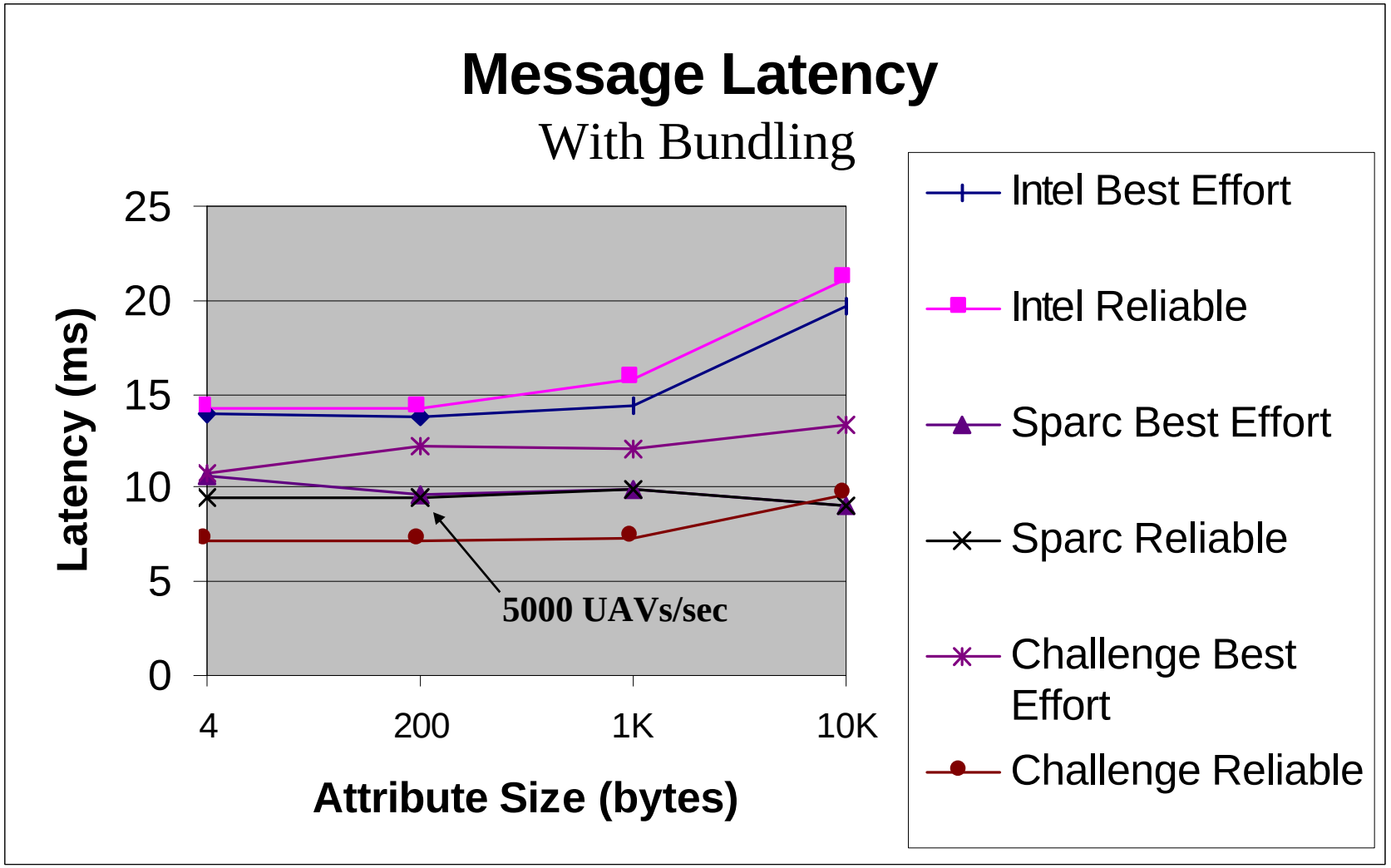

Flat Class Hierarchy  2 benchmark federates (1 sending, 1 receiving)
1 object/federate with 1 attribute/object

# Baseline Scalability Results



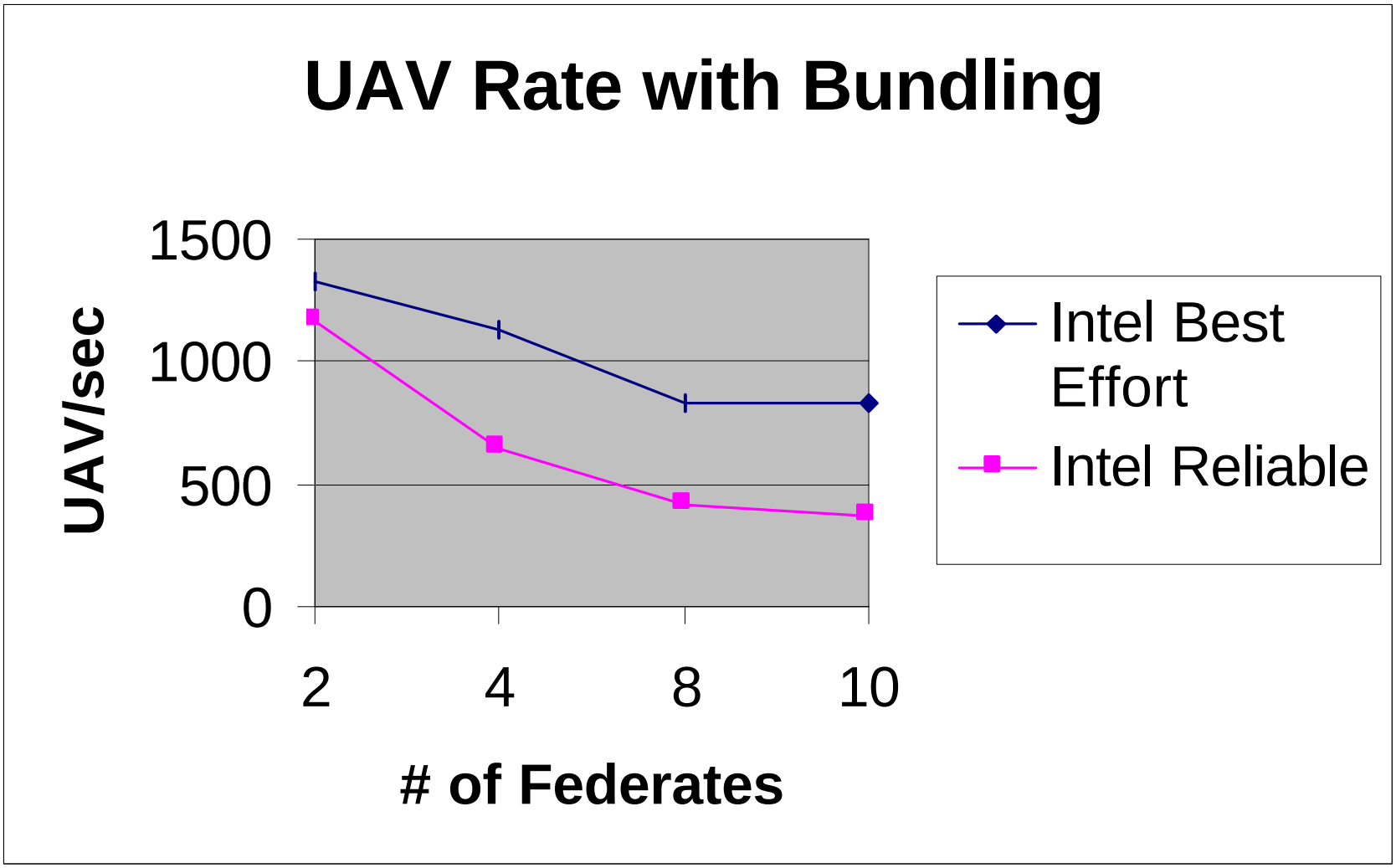

Flat Class Hierarchy 2 benchmark federates (1 receiving , 1 sending)
1 object/federate with 1 attribute/object

# Baseline Scalability Results



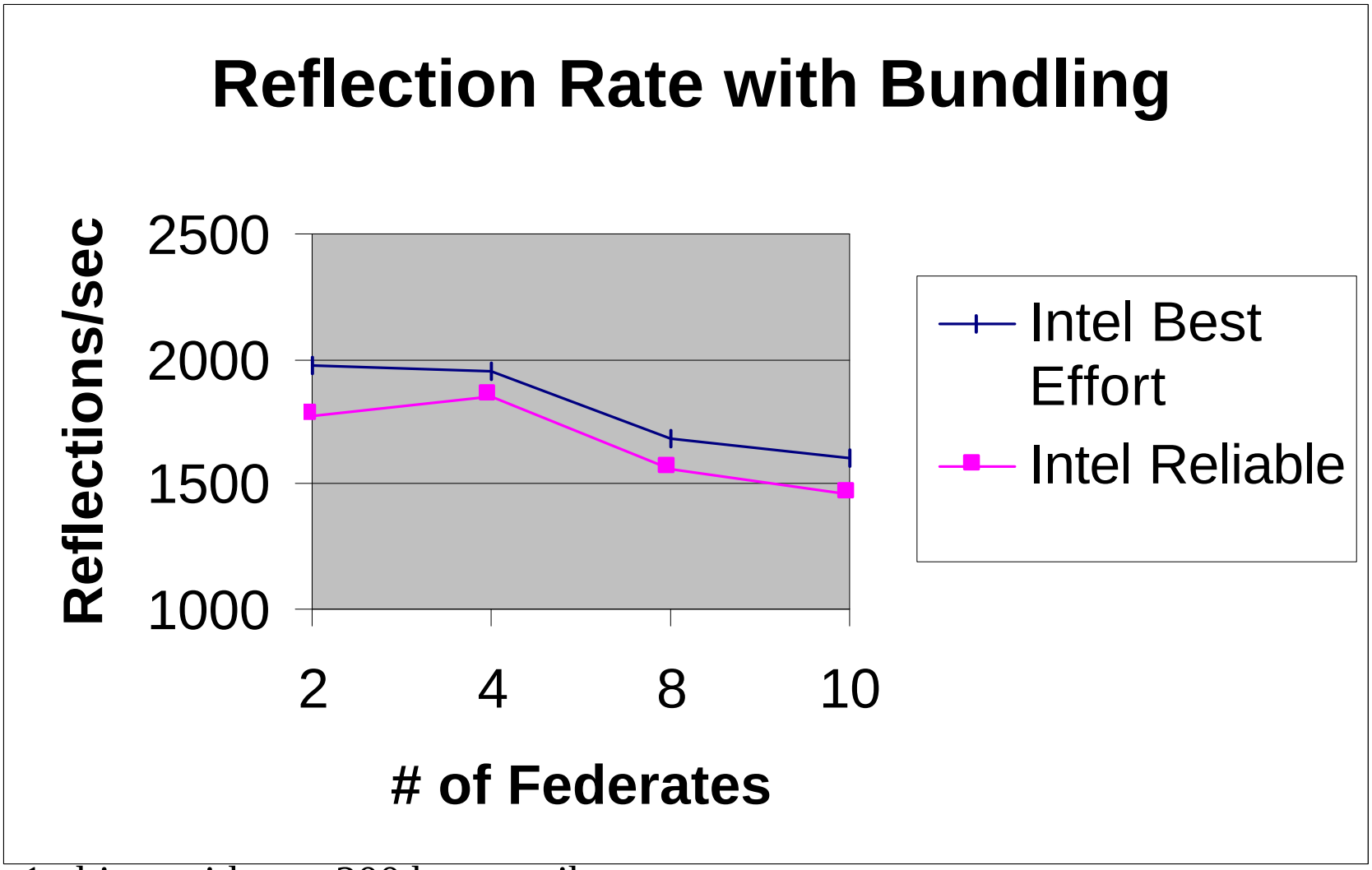

Flat Class Hierarchy  2 benchmark federates (1 receiving , 1 sending)
1 object/federate with 1 attribute/object

# Baseline Federation Scalability Results




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

# Baseline Federation Scalability Results




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