



RTI Performance Testing

Russ Richardson

Roger Wuerfel

SAIC

28 September, 1998

REPORT DOCUMENTATION PAGE

Form Approved OMB No.
0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 28-09-1998		2. REPORT TYPE Briefing		3. DATES COVERED (FROM - TO) 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	
		Public Release	15	Fenster, Lynn lfenster@dtic.mil	
a. REPORT Unclassified		b. ABSTRACT Unclassified	c. THIS PAGE Unclassified	19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007	
				Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std Z39.18	

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**

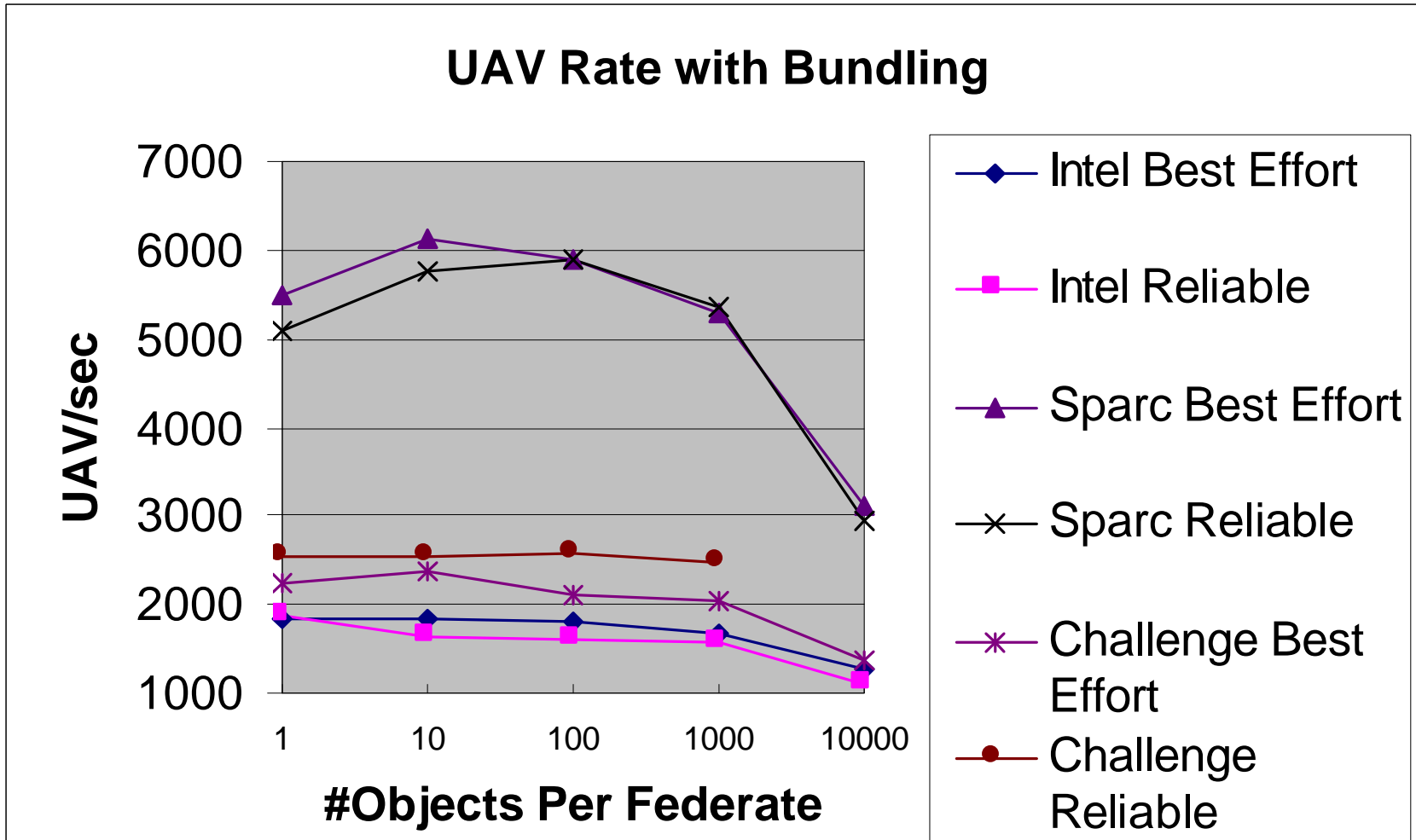
Application Specific RTI Performance Testing

- 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

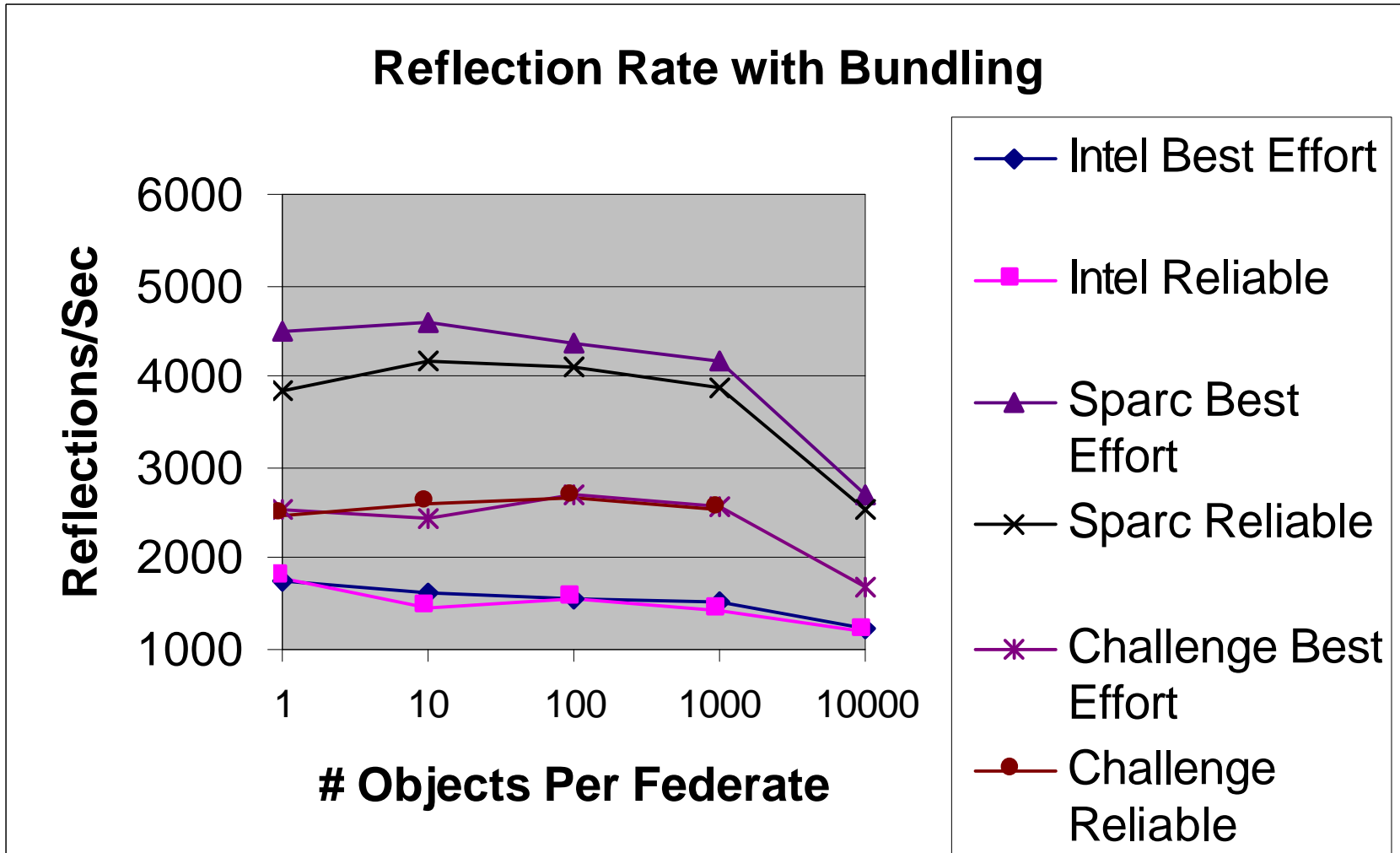
- **Baseline Scalability**
- **Baseline Federation Scalability**

Baseline Scalability Results



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

Baseline Scalability Results



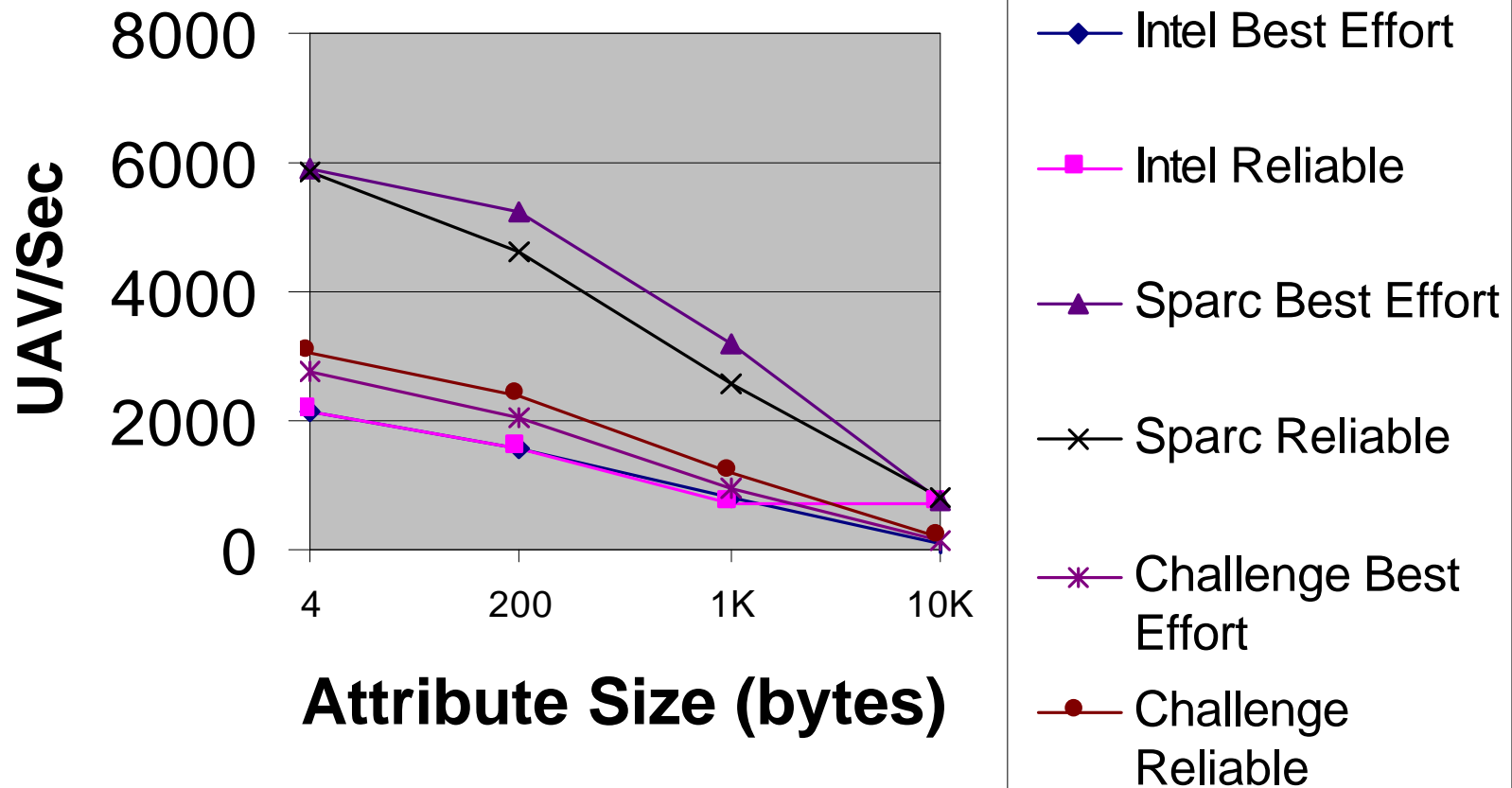
Flat Class Hierarchy

2 benchmark federates (1 receiving , 1 sending)

One 100 byte attribute/object

Baseline Scalability Results

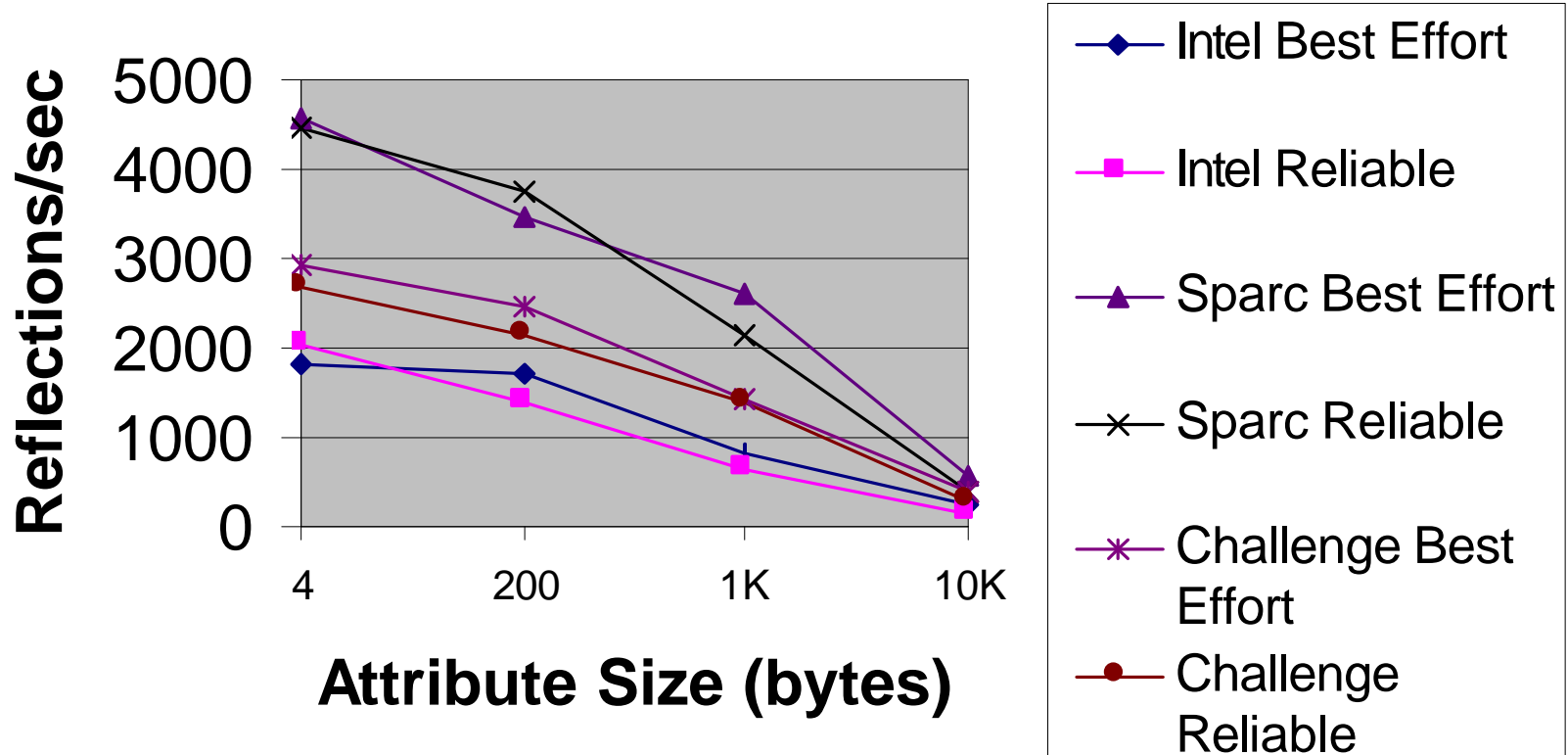
UAV Rate with Bundling



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

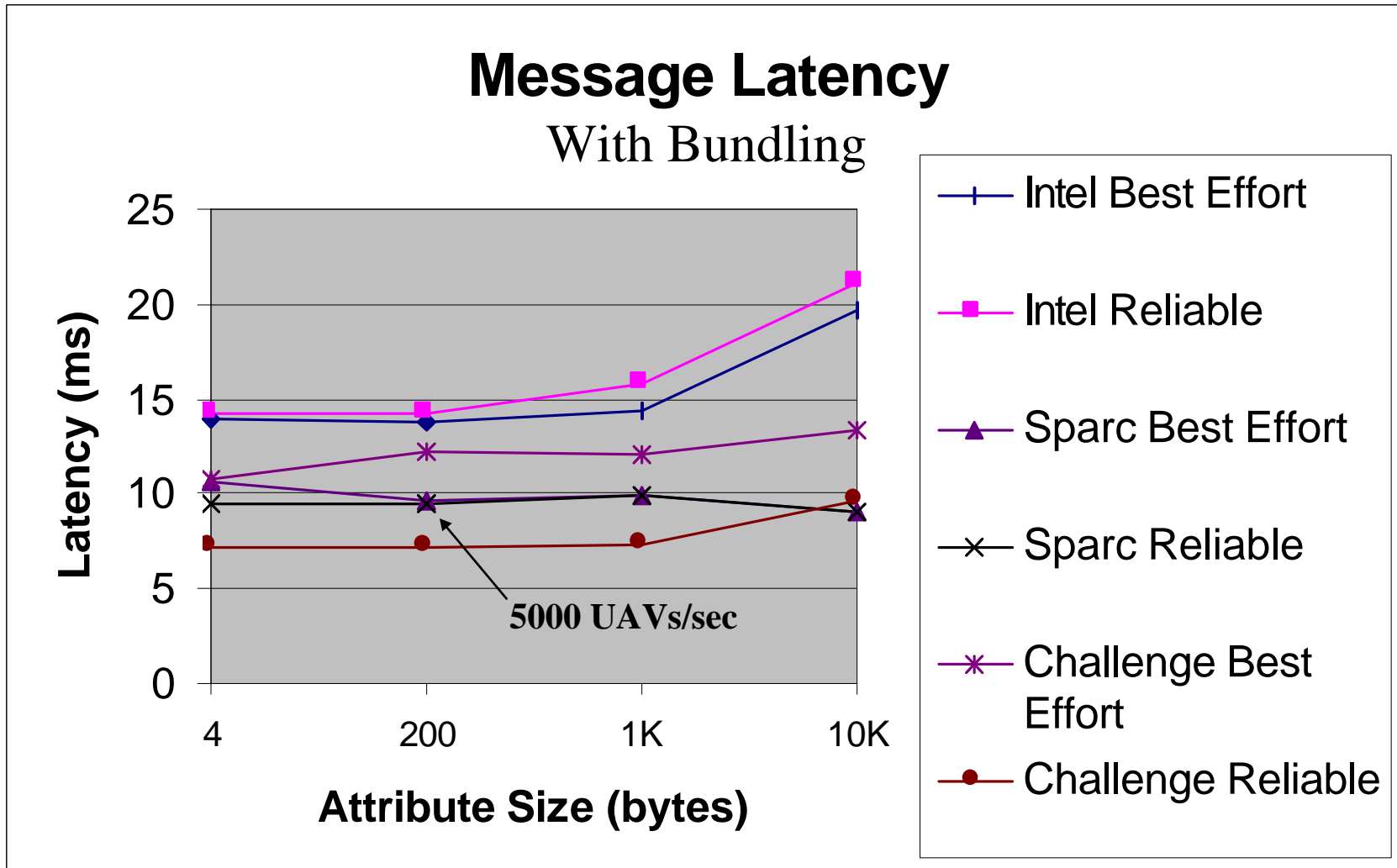
Baseline Scalability Results

Reflection Rate with Bundling



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

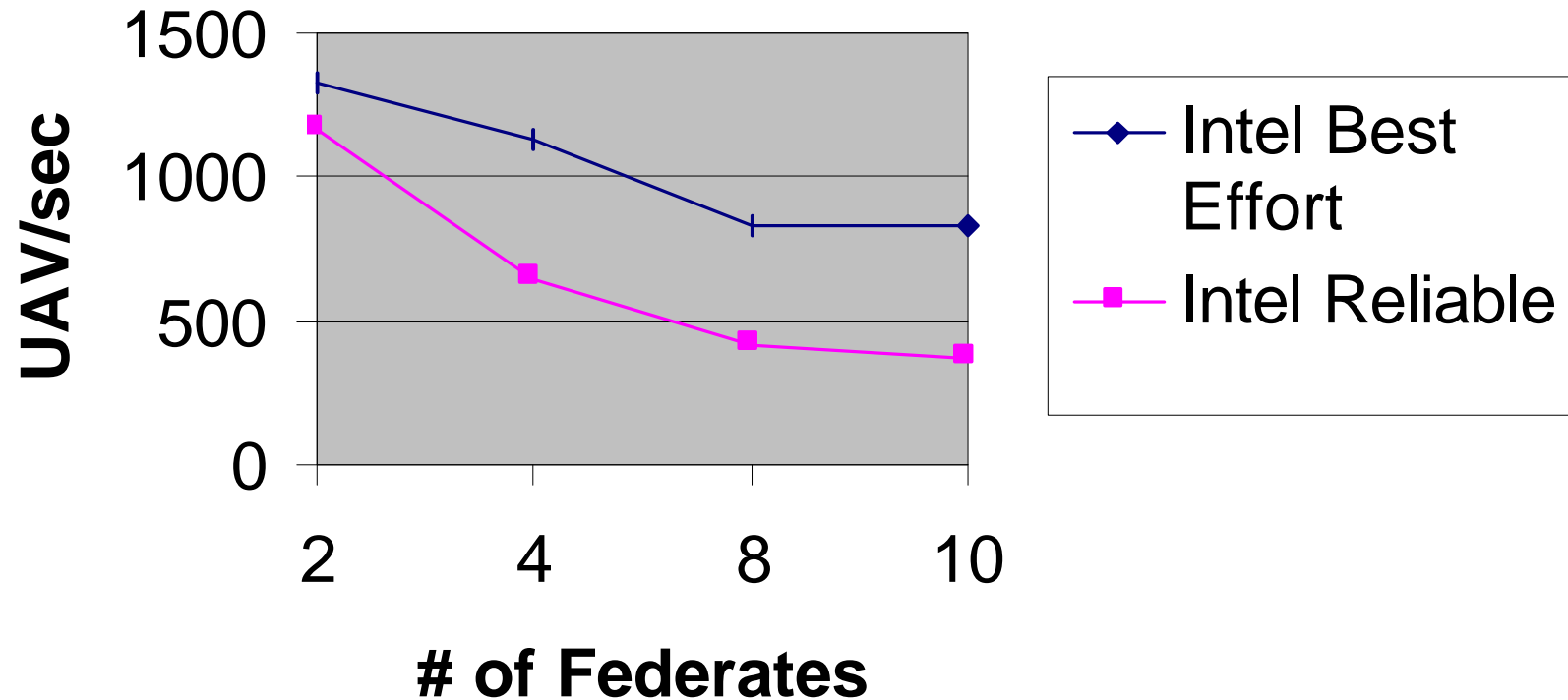
Baseline Scalability Results



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

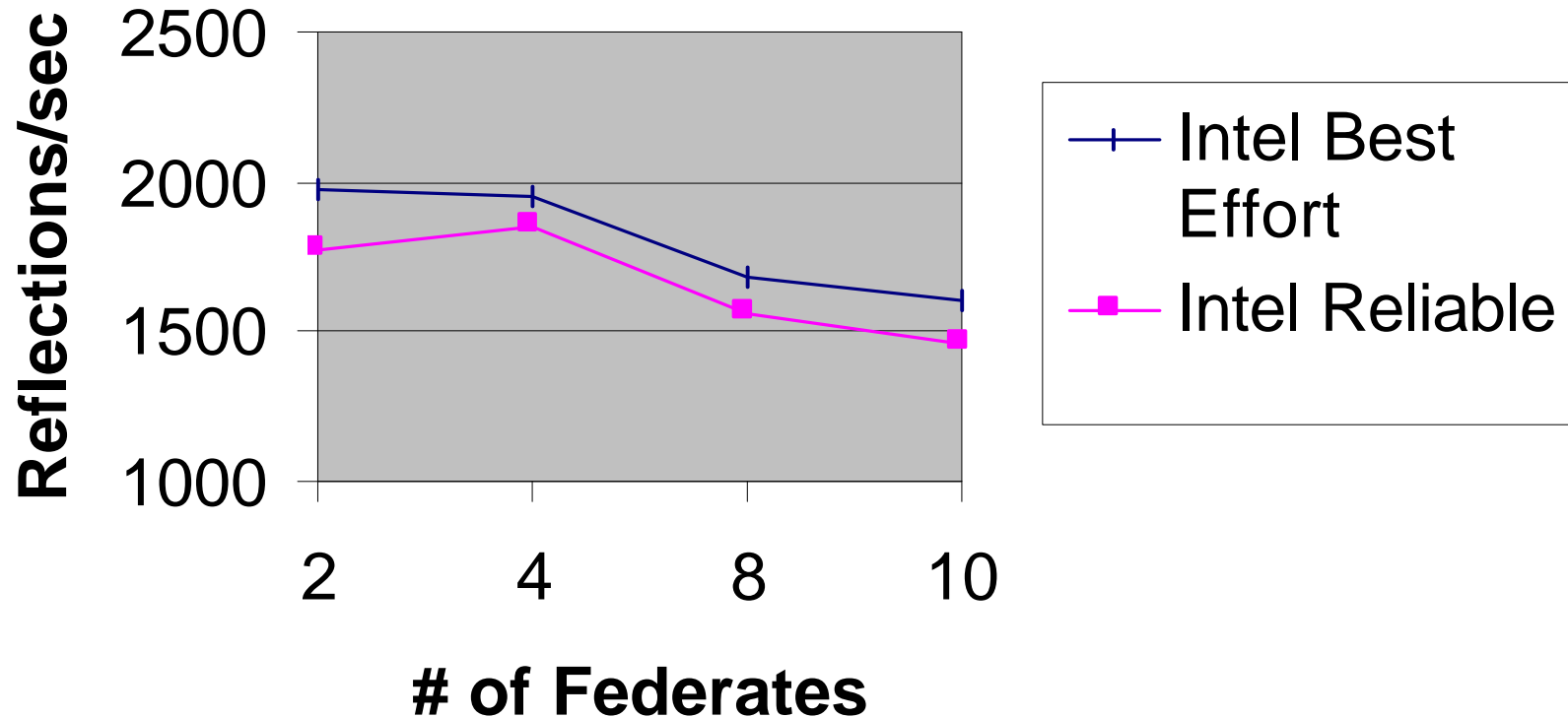


1 object with one 200 byte attribute

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