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Real-Time Mobile Applications in Intermittently Connected Networks

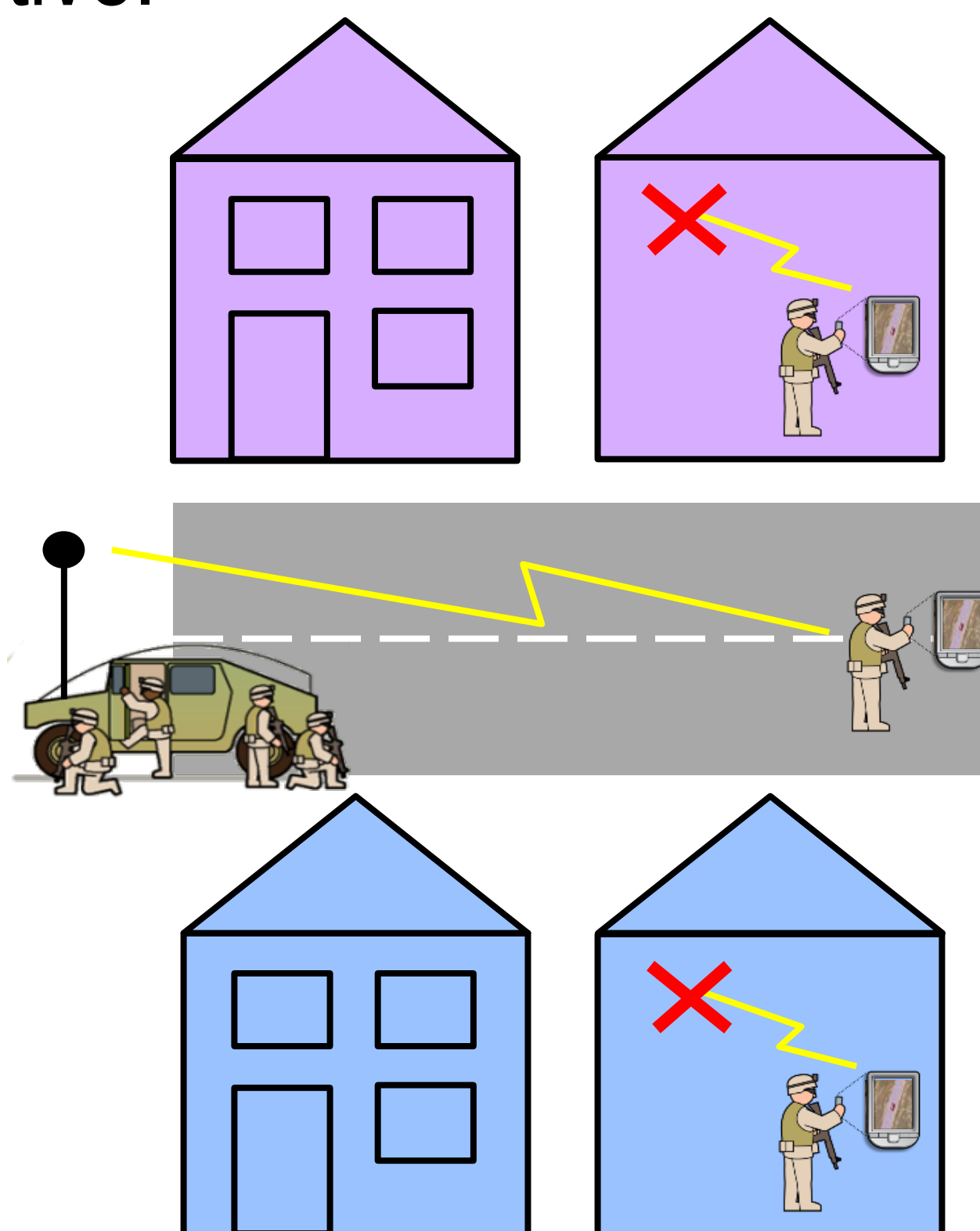
Problem Statement

Problem

- Real-time distributed applications depend on reliable communications.
- Tactical environments are often characterized by disconnected, intermittent and low-bandwidth (DIL) communications.

To address this problem, we seek to develop methods that

- Enable real-time shared group context in a DIL environment.
- Keep information synchronized in real time despite communication outages.
- Apply group context to make these more effective.



Scenario with Varying Connectivity

Approach

Keep network users productive

We consider three communication states



Connected State

Goal	Techniques
Maintain shared group context	Pre-cache data likely to be relevant later in the mission
Make best use of available bandwidth	Delay transmission of noncritical data

Disconnected State

Applications continue to function	Predict team location based on mission plan
Predict state where possible	Provide connectivity map to help the user reconnect

Reconnecting State

Re-establish shared group context as quickly and accurately as possible	Prioritize synchronization of critical messages
	Eliminate redundant messages

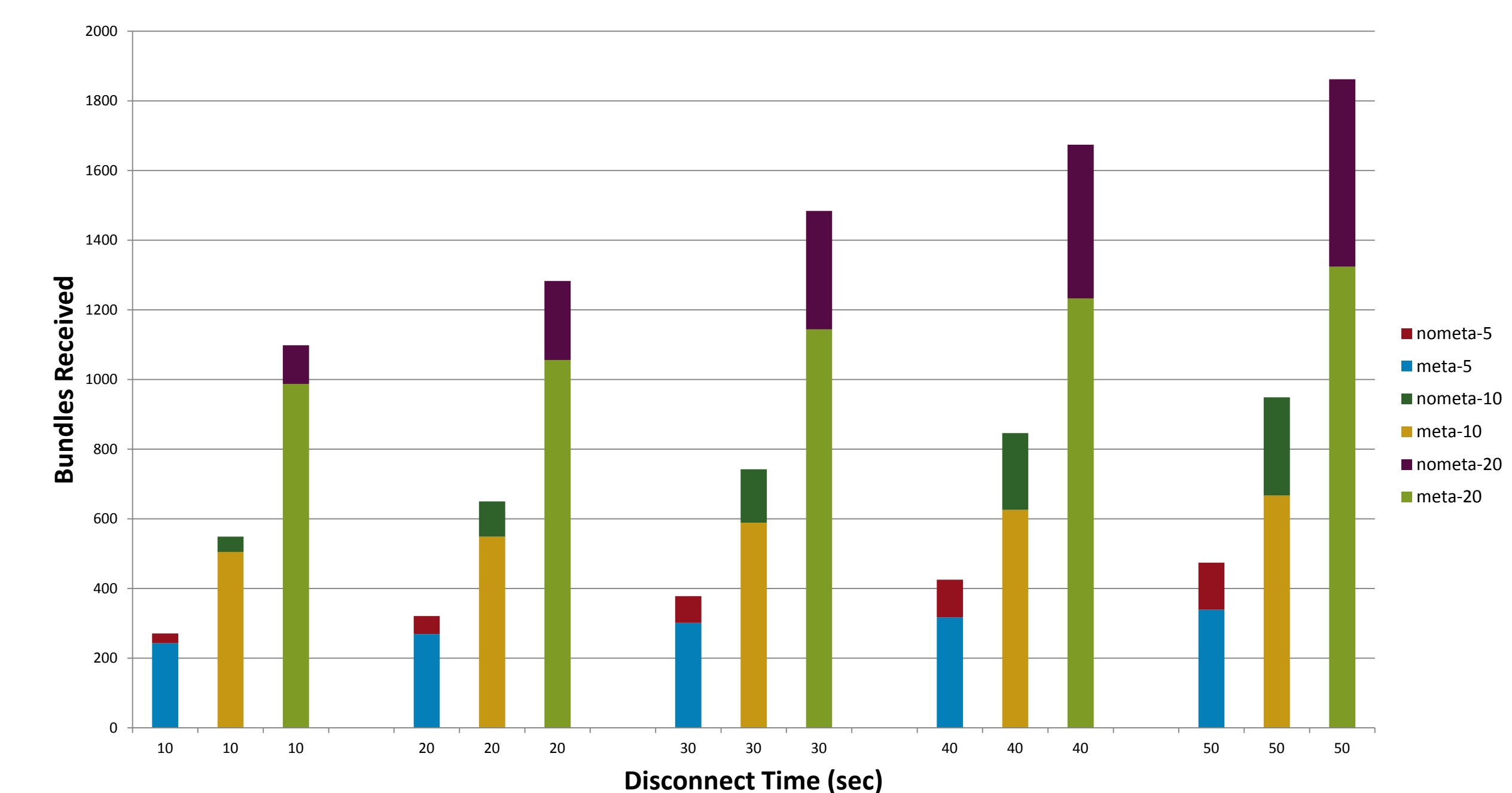
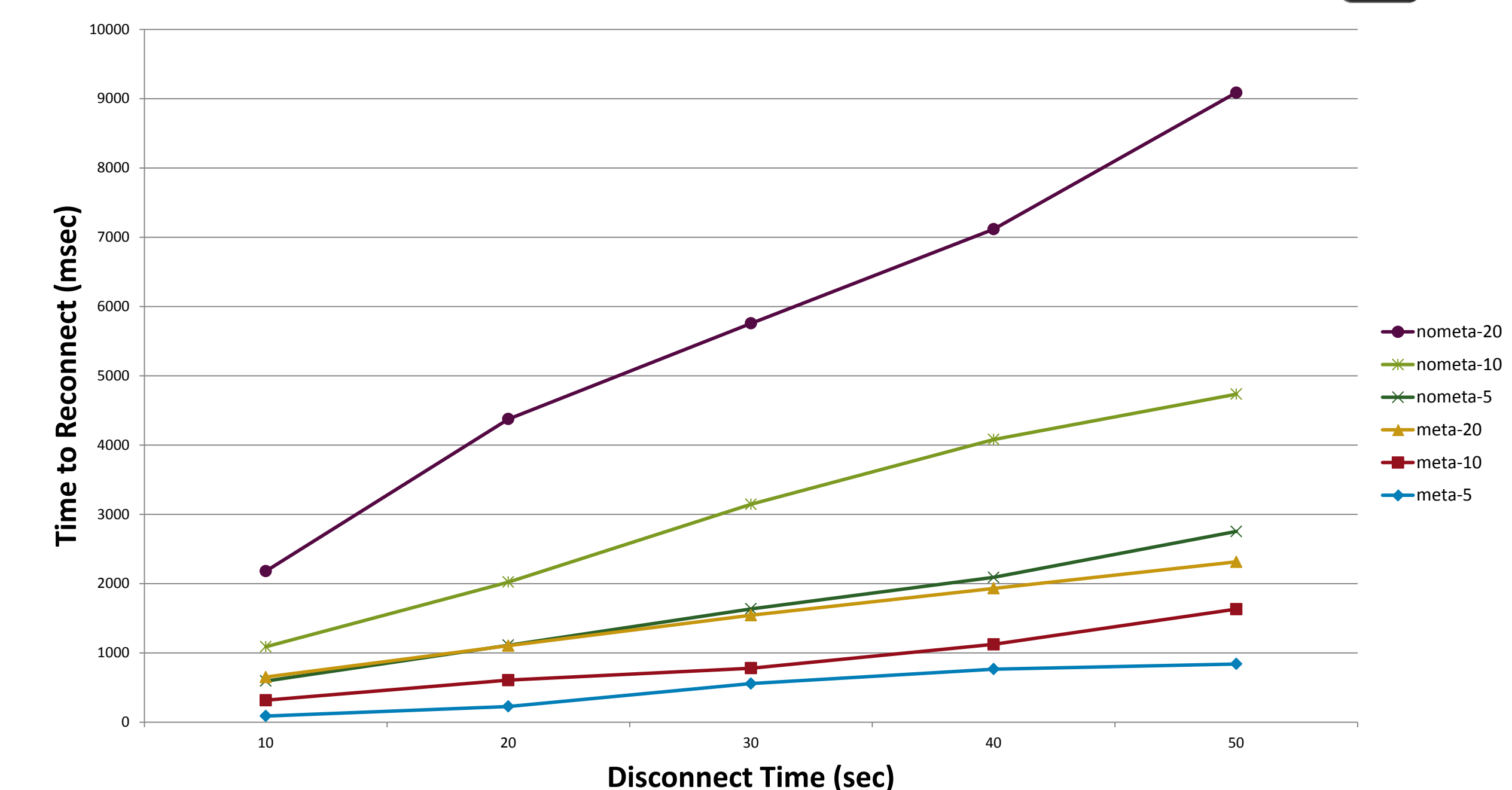
Results

Implementation: ISE+

- DTN (Delay Tolerant Networking) bundle protocol used for message deliver
- DTN Metadata Extension Blocks



Measured Improvements



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