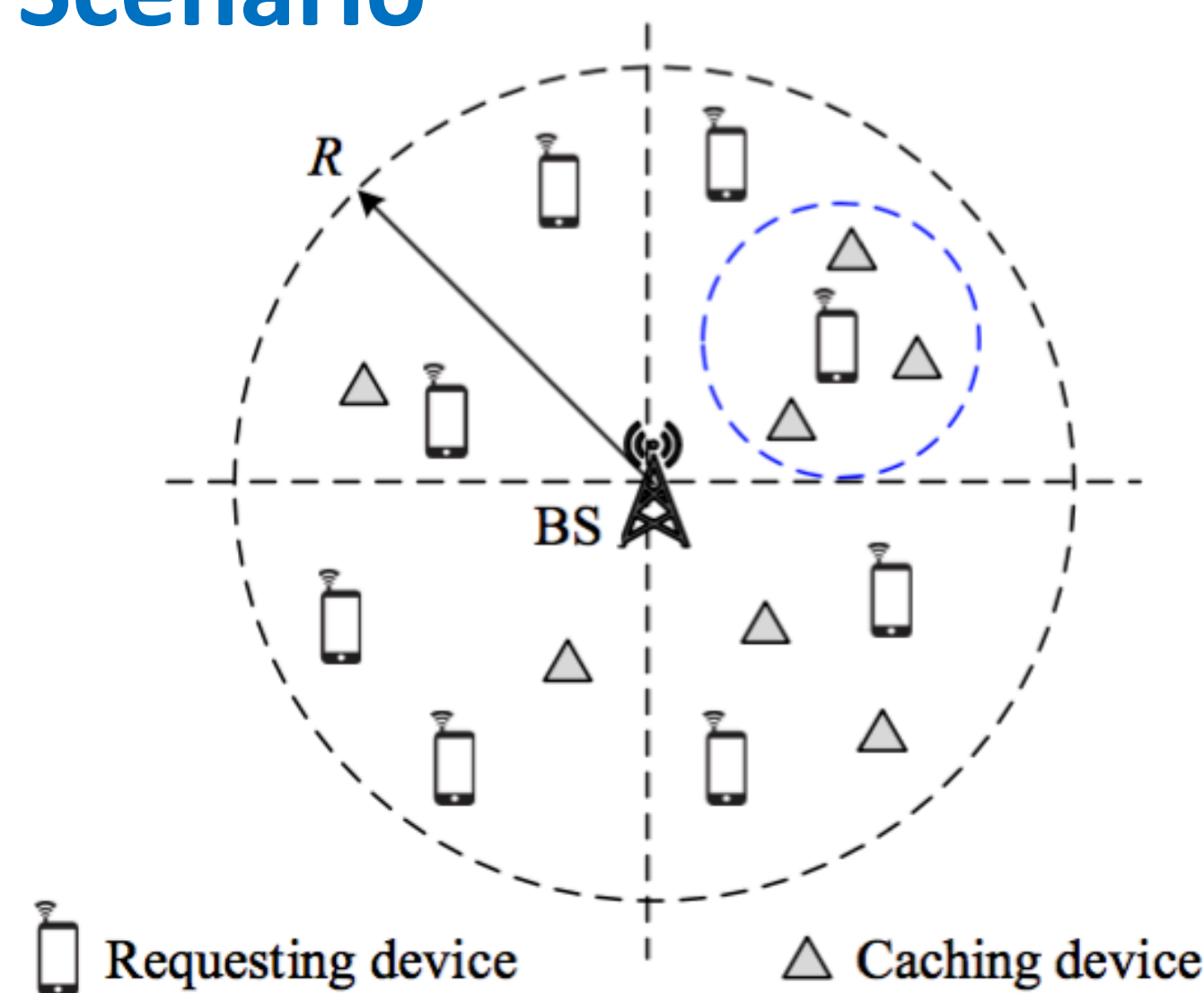


Collaborative Message Distribution via Device-to-Device (D2D) Communications

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Scenario



- A device-to-device (D2D) communication link is established between a requesting device and a caching device if the caching device is reachable to the requesting device.

Motivation

Design a pairing strategy that will not consume too much time:

- Keep the latency in an acceptable level
- Satisfy as many D2D requesting devices as possible

Our Solution: Channel-Aware Pairing Strategy

Step one:

(a) At the end of each time slot, add the requesting devices that have requests for the messages cached by one of the caching devices into the waiting queue.

(b) Choose requesting devices from the waiting queue in the order that the requests were sent to the server.

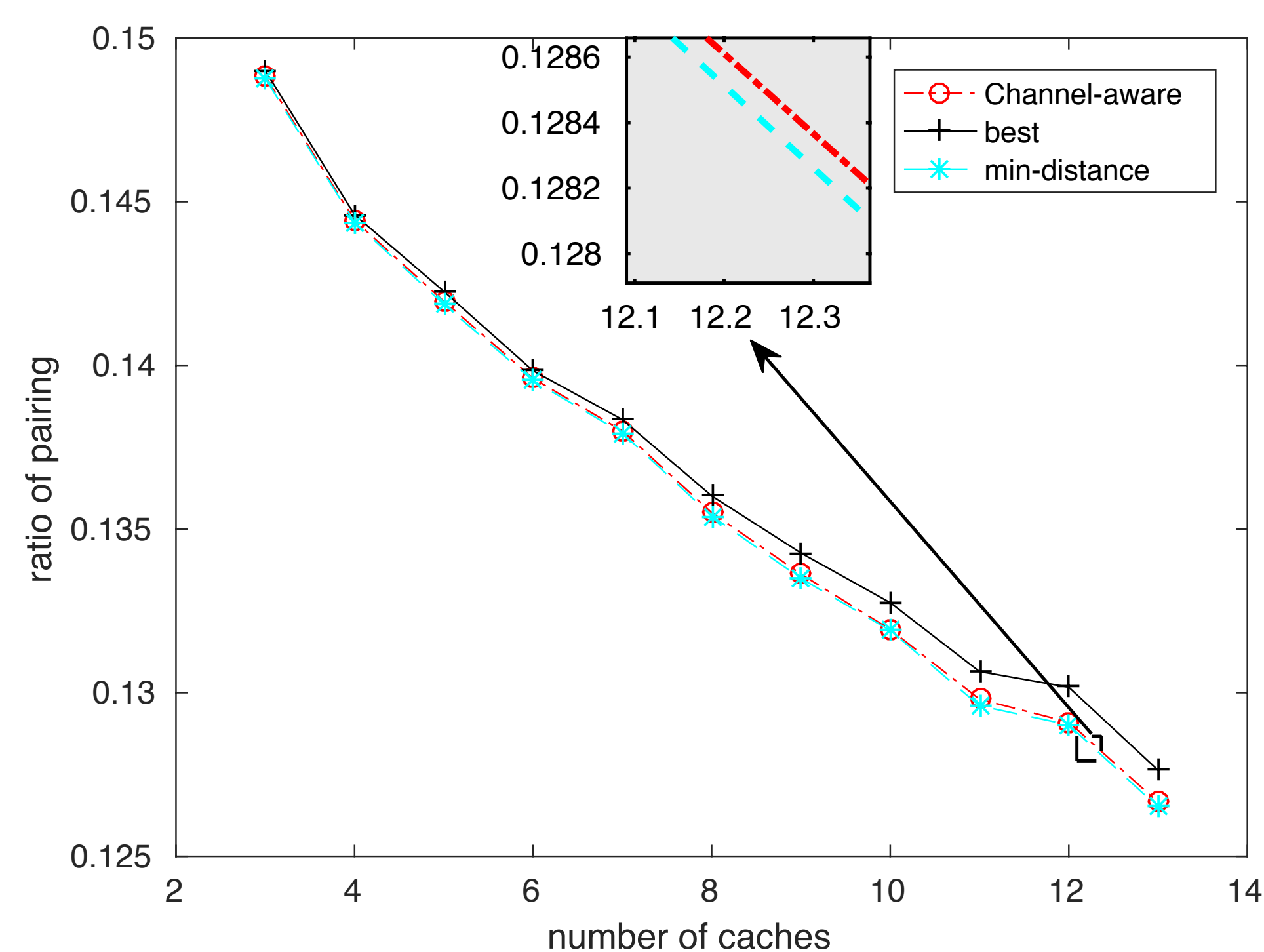
Step two:

(a) For a chosen requesting device from the waiting queue, find out all feasible caching devices as candidates.

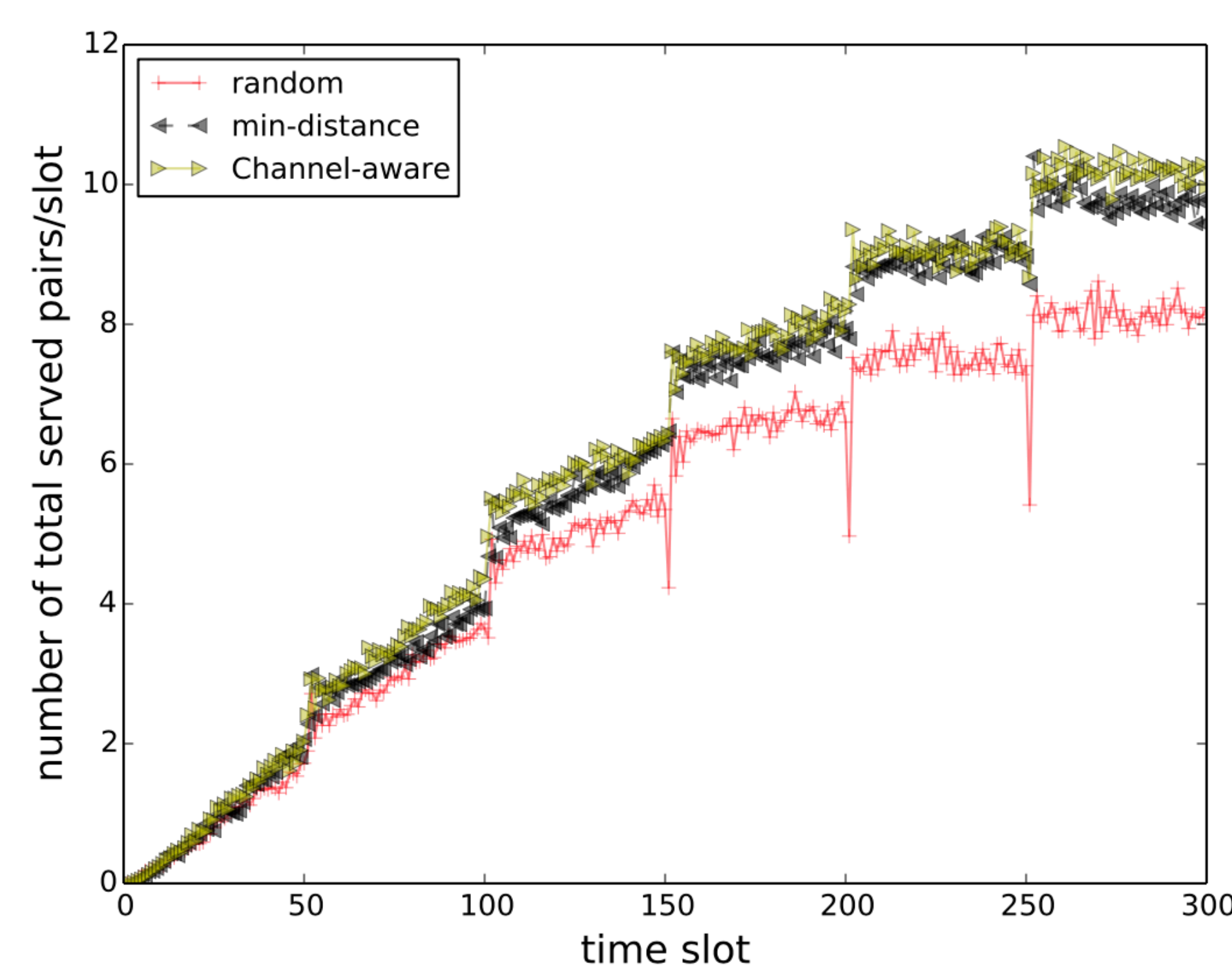
(b) Choose the caching device that has the best channel state, and establish a D2D link between the caching device and the requesting device.

(c) Iterate over all requesting devices until the end of the waiting queue.

Simulation Results



Static scenario



Dynamic scenario