Progress Report: Congestion Control Implementation

9th NDN Retreat

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The University of Arizona

Motivation: Why Congestion Control Is Important

Crucial part of **Application Performance**

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- Hadoop on NDN

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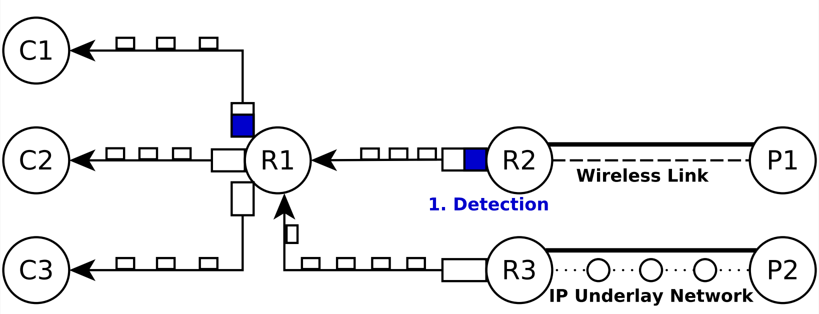
- Hadoop on NDN
- Frequent questions about **ndnchunks** (mailing list)
- Wireless networks, data center, testbed etc.

Implementation Overview

From PCON paper [1]:



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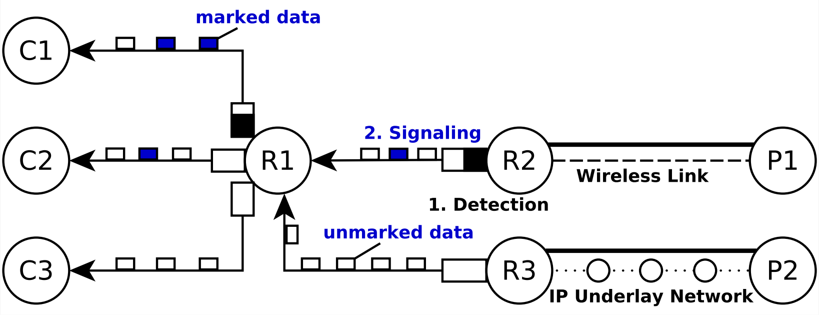

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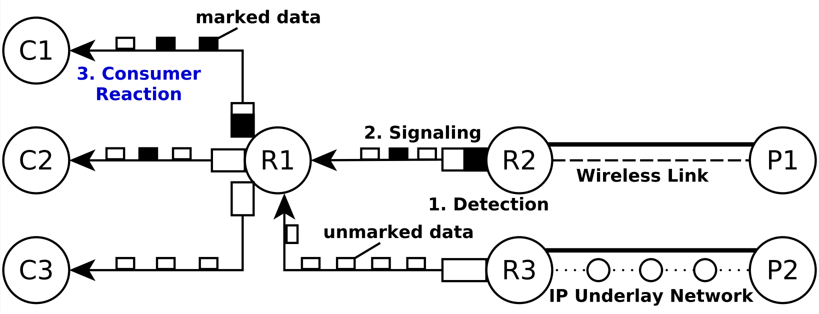

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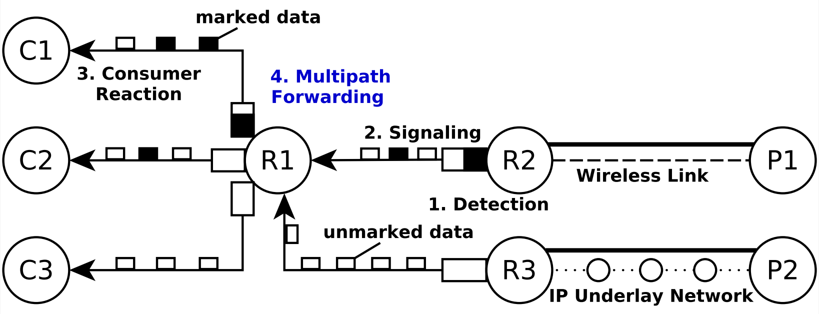

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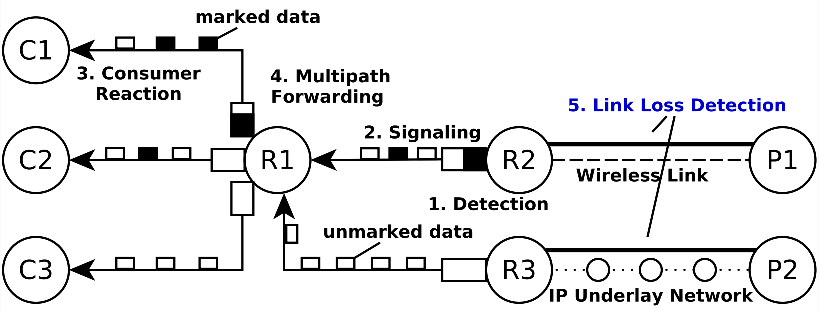
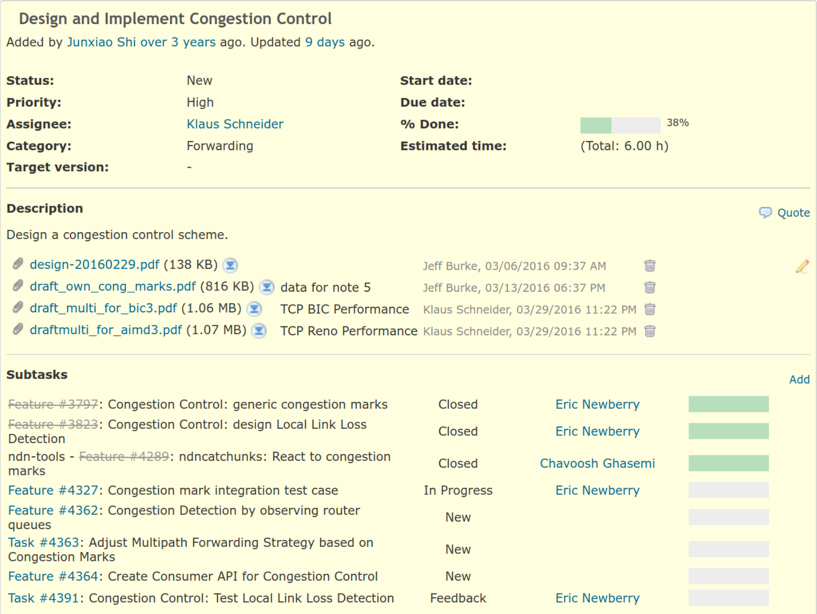


Implementation Overview: Redmine



Design and Implement Congestion Control

Added by Junxiao Shi over 3 years ago. Updated 9 days ago.

Status:	New	**Start date:**	
Priority:	High	**Due date:**	
Assignee:	Klaus Schneider	**% Done:**	38%
Category:	Forwarding	**Estimated time:**	(Total: 6.00 h)
Target version:	-		

Description

Design a congestion control scheme.

design-20160229.pdf (138 KB)		Jeff Burke, 03/06/2016 09:37 AM
draft_own_cong_marks.pdf (816 KB)	data for note 5	Jeff Burke, 03/13/2016 06:37 PM
draft_multi_for_bic3.pdf (1.06 MB)	TCP BIC Performance	Klaus Schneider, 03/29/2016 11:22 PM
draftmulti_for_aimd3.pdf (1.07 MB)	TCP Reno Performance	Klaus Schneider, 03/29/2016 11:22 PM

Subtasks

~~Feature #3797~~: Congestion Control: generic congestion marks	Closed	Eric Newberry	🟩
~~Feature #3823~~: Congestion Control: design Local Link Loss Detection	Closed	Eric Newberry	🟩
ndn-tools - ~~Feature #4289~~: ndncatchunks: React to congestion marks	Closed	Chavoosh Ghasemi	🟩
Feature #4327: Congestion mark integration test case	In Progress	Eric Newberry	⬜
Feature #4362: Congestion Detection by observing router queues	New		⬜
Task #4363: Adjust Multipath Forwarding Strategy based on Congestion Marks	New		⬜
Feature #4364: Create Consumer API for Congestion Control	New		⬜
Task #4391: Congestion Control: Test Local Link Loss Detection	Feedback	Eric Newberry	⬜

What We Accomplished since last Retreat

Thanks to Eric, Davide, Chavoosh, Junxiao, and others.

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    - Catchunks: React to congestion marks
    - Catchunks: AIMD adaptation, reduced version discovery timeout, Conservative (SACK) window adaptation, printSummary
3. NDNLP Link Loss Detection
    - Detect lost packets in NDNLP (ACK Timeout)
    - Signal to forwarding strategy **onLostInterest()**.

Future Work and Timeline

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3. **Consumer/Producer API** – timeline: 9 months
    - Look at Ilya's work and Cisco's libcnet API

The End

Any Questions?

Klaus Schneider

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https://www.cs.arizona.edu/~klaus/

References i

[1] Klaus Schneider, Cheng Yi, Beichuan Zhang, and Lixia Zhang.
A practical congestion control scheme for named data networking.
In *Proceedings of the 2016 conference on 3rd ACM Conference on Information-Centric Networking*, pages 21–30. ACM, 2016.