ndnSIM - Feature #4578

Make NFD Congestion Control work in ndnSIM

04/12/2018 03:42 PM - Klaus Schneider

Status:	Closed		**Start date:**	
Priority:	Normal		**Due date:**	
Assignee:	Eric Newberry		**% Done:**	100%
Category:			**Estimated time:**	3.00 hours
Target version:				

Description
The current NFD congestion detection doesn't work in ndnSIM, since ndnSIM doesn't use the regular TCP, UDP, or Unix faces.
We can discuss how to fix this below.

Related issues:		
Related to ndnSIM - Task #4672: ndnSIM Congestion Control: Implement BIC and ...	**Closed**	**07/18/2018**

History

#1 - 04/12/2018 03:43 PM - Klaus Schneider

From our email discussion (Davide's answer to me):

On Thu, Apr 12, 2018 at 6:21 PM, Klaus Schneider klaus@cs.arizona.edu wrote:

> Forwarding as a more general question:
>
> Is there some fundamental reason why the congestion control scheme
> implemented in NFD wouldn't work (at least out of the box) in ndnSIM?

Yes. ndnSIM doesn't use NFD's faces because, well, it's a simulator,
so it obviously cannot use regular OS sockets.

> I have two guesses:
>
> > 1. Maybe it's the way ndnSIM handles the face/transport classes for TCP, UDP, and Unix sockets? Do we need add support for ndnSIM faces
> > here?

Yep. NetDeviceTransport needs to gain an implementation (override) of
the virtual function(s) that were added for congestion control.

> > 1. Is NDNLP fully supported in ndnSIM, i.e., the way congestion marks are carried from link to link?

It should be, but I'm not sure.

#2 - 04/12/2018 03:57 PM - Davide Pesavento

- Project changed from NFD to ndnSIM

- Parent task deleted (#1624)

#3 - 04/13/2018 08:20 AM - Junxiao Shi

- Tracker changed from Task to Feature

- Start date deleted (04/12/2018)

- Estimated time set to 3.00 h

> NetDeviceTransport needs to gain an implementation (override) of the virtual function(s) that were added for congestion control.

There are two functions:

- [Transport::getSendQueueCapacity](#) should return [QueueBase::GetMaxBytes](#)
- [getSendQueueLength](#) should return [QueueBase::GetNBytes](#)

The implementation is trivial, and can qualify as a beginner task.

> Is NDNLP fully supported in ndnSIM, i.e., the way congestion marks are carried from link to link?

Yes, see ndnsim:commit:5ea3322623a0550799431f25b2fc4e7e4df5c046.

#4 - 04/13/2018 08:44 PM - Klaus Schneider

Thanks for the clarification.

But I think a much cleaner solution would be to provide a queue class that does the congestion marking, as I did with "codel-queue2" in my simulation code: https://github.com/schneiderklaus/ns-3-dev/tree/ndnSIM-v2/src/internet/model

The current NFD code is basically a poor CoDel implementation, as a workaround since we can't access or change the queuing discipline of NFD routers.

In ndnSIM, it's much easier to change the queuing discipline and using the actual CoDel code should improve performance.

With this queue implementation, the only thing the user needs to do is to change the default queue of all netdevices:

```
Config::SetDefault ("ns3::PointToPointNetDevice::TxQueue", StringValue ("ns3::CoDelQueue2"));
```

#5 - 05/16/2018 12:37 PM - Klaus Schneider

Can someone assign this to Eric?

Somehow I can't edit the description.

#6 - 05/16/2018 01:04 PM - Alex Afanasyev

- Assignee set to Eric Newberry

#7 - 05/16/2018 06:40 PM - Eric Newberry

- Status changed from New to In Progress

#8 - 07/04/2018 01:44 PM - Eric Newberry

- Status changed from In Progress to Code review

- % Done changed from 0 to 100

#9 - 07/15/2018 11:34 AM - Eric Newberry

- Status changed from Code review to Closed

#10 - 07/18/2018 01:45 PM - Klaus Schneider

- Related to Task #4672: ndnSIM Congestion Control: Implement BIC and CUBIC added