LAB5: More TraceSources and Trace Helpers

CS169: Mobile Wireless Networks - Winter 2017

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More TraceSources

- Let's go back to mythird.cc
- Go to ns-3 doxygen and look for All TraceSources
- Look for PhyTxBegin of WifiPhy
- Look for Config Path and Callback Signature
- Let's create a trace sink function and wire it to the trace source "PhyTxBegin"

TxRxPointToPoint

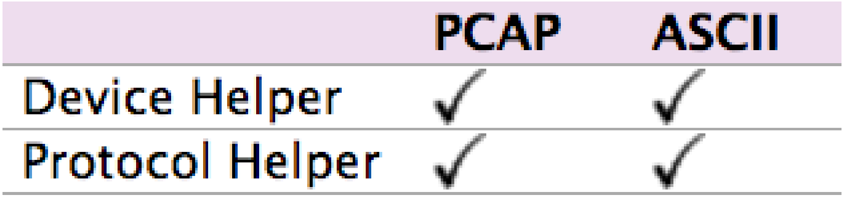
- Let's go to myfifth.cc
- Create a trace sink function and wire to to the trace source "TxRxPointToPoint"
- Observe txTime and rxTime of the following parameter changes
- Change the number of packets to 1
- Change packet size
- Change p2p channel data rates and delay

Previously Seen Trace Helpers

```
pointToPoint.EnablePcapAll ("second");
pointToPoint.EnablePcap ("second", p2pNodes.Get (0)->GetId (), 0);
csma.EnablePcap ("third", csmaDevices.Get (0), true);
pointToPoint.EnableAsciiAll (ascii.CreateFileStream ("myfirst.tr"));
```

Trace Helpers - A Big Picture

Each helper has Methods + Filenames



	PCAP	ASCII
Device Helper	✓	✓
Protocol Helper	✓	✓

Device Helpers - PCAP

- Which device supports PCAP?
- `$ find . -name "*.cc" | xargs grep ::EnablePcapInternal`
- Different Methods to enable PCAP.
- *void EnablePcap (std::string prefix, <Ptr >NetDevice nd, bool promiscuous = false, bool explicitFilename = false);*
  void EnablePcap (std::string prefix, std::string ndName, bool promiscuous = false, bool explicitFilename = false);
  void EnablePcap (std::string prefix, NetDeviceContainer d, bool promiscuous = false);
  void EnablePcap (std::string prefix, NodeContainer n, bool promiscuous = false);
  void EnablePcap (std::string prefix, uint32_t nodeid, uint32_t deviceid, bool promiscuous = false);
  void EnablePcapAll (std::string prefix, bool promiscuous = false);

Device Helpers - PCAP

- PCAP Filenames
- Common forms - `<prefix>-<node id>-<device id>.pcap`
- Explicit filenames
- *helper.EnablePcap ("my-pcap-file.pcap", nd, true, true);*

Protocol Helpers - PCAP

- Which protocol supports PCAP?
- `$ find . -name "*.cc" | xargs grep ::EnablePcapIpv4`
- Different Methods to enable PCAP.
- **Interface:** *helper.EnablePcapIpv4 ("prefix", interfaces);*
  Node: *helper.EnablePcapIpv4 ("prefix", n);*
  Node+Device ID: *helper.EnablePcapIpv4 ("prefix", 21, 1);*
  All: *helper.EnablePcapIpv4All ("prefix");*

Protocol Helpers - PCAP

- PCAP Filenames
- Common forms - `<prefix>-n<node id>-i<interface id>.pcap`
- Explicit filenames are also available.

Questions?

Exercise

- Extend mythird.cc to display MacTx events of Wifi nodes (both cases where node running echo client and node not running echo client)
- Extend myfifth.cc to display NextTxSequence of TcpSocketBase
- On myfifth.cc, set error rate to 10^{-3} and then 10^{-5} and enable pcap on Internet stack. Use tshark or tcpdump to compare the results of the two error-rate scenarios