Animation in ns-3

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Animation Overview

- Standalone Animator (NetAnim)
  - Written completely in C++
  - Qt 4.4.0 graphics library
    - Common API across windows, linux, Mac
  - Reads text-based file describing the simulation
    - Node canvas locations
    - Node connectivity
    - Packet transmission
    - Packet Arrival

HowTo Create the Anim File

- Create (wired) topology normally
- Aggregate a **`CanvasLocation`** Object to each node
  - Stock topology objects do this automatically
  - See point-to-point-dumbell.cc
- Create an object of type **`AnimationInterface`**
- Call the Animation Interface API as needed
- Run the simulation normally

The **AnimationInterface** API

- SetOutputFile(const string&);
  - Specifies the name of the output file
- SetXMLOutput(); // Discussed later
- StartAnimation();
  - Creates the output file and dumps all node objects and all link objects.
- Stop Animation();
  - Closes output file
  - Automatically called in destructor, not totally needed

Demonstration Here

Wireless Animation

- Wireless packets have one transmitter, but multiple receivers
- Wireless packets loose signal strength as the propagate further from the transmitter
- Wireless trace callbacks are (obviously) at different points in the ns-3 code tree.
- Work-in-progress to get this working
- XML format trace file
  - Better supports the semantics needed for wireless
  - In fact, better support for wired semantics as well

Improved NetAnim Features

- Read XML file
- Optional Node Image
  - Satellite, VOIP phone, etc.
- Optional Node Colors
- Optional Packet Colors
- Pan/Zoom
- Merge multiple anim files.

Wireless Animation Demo Here

Summary

- First NetAnim released with ns-3.7
  - Wired point-to-point only
- Next Release planned ns-3.9
  - Wireless
  - XML
  - More features in wired simulation