Ptolemy Introduction

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Overview

- Open-Source Modeling platform
- **Actor**-oriented design
  - Base unit of development
  - Individual “state” or unit of model that can communicate via messages

- **Director**-oriented execution
  - Director determines how actors interact with each other
  - Useful director domains for this class:
    - Process Networks (for Kahn Process Networks)
    - Dataflow (for message-passing, SDF)
    - Rendezvous
    - Synchronous Reactive (some FSM/StateChart functionality)

- Hierarchical
  - Any actor can be a composite actor or super-state (even from a different domain!)
  - Provides versatility, though at the cost of complexity
A First Look

Within this composite, a tick of the clock only occurs when a true value is provided on the enable input port in the enclosing model. Thus, this subsystem has a clock that is a subclock of that of the enclosing model.

Note that because of the subclock in this composite, this NonStrictDelay behaves like Pre. If it were put at the top level, it would not.

Note that this display fires only when the enabled port receives a true token. This is because only then is there a tick of the clock.
Director Settings

• Timing
  – # iterations (for discrete domains)
  – Time step, period, etc.

• Schedule sequence
  – Almost always use default (based on data flow)
Input Actors (Sources)

- Can be simple (sequence of numbers) or complex (sinusoidal waves)
- Iterate based on director settings
Execution Actors

- Perform operations on inputs based on built-in functionality
- Optionally, provide processed output
Output Actors

- Enable hierarchical functionality
- Sinks
  - Display
  - Plotter
That’s really about it!

- Very simple interface, and operations, but the large number of actors, directors, and I/O makes it very powerful
- Who uses Ptolemy?
  - Agile Design
  - Agilent Technologies
  - LBNL
  - Lockheed Martin
  - RIM
  - and more…