

Trigger Simulation Framework using Ptolemy

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Copies of slides can be found at: <http://home.cern.ch/~wheeler/ptolemyStuff.html>

Ptolemy Simulation

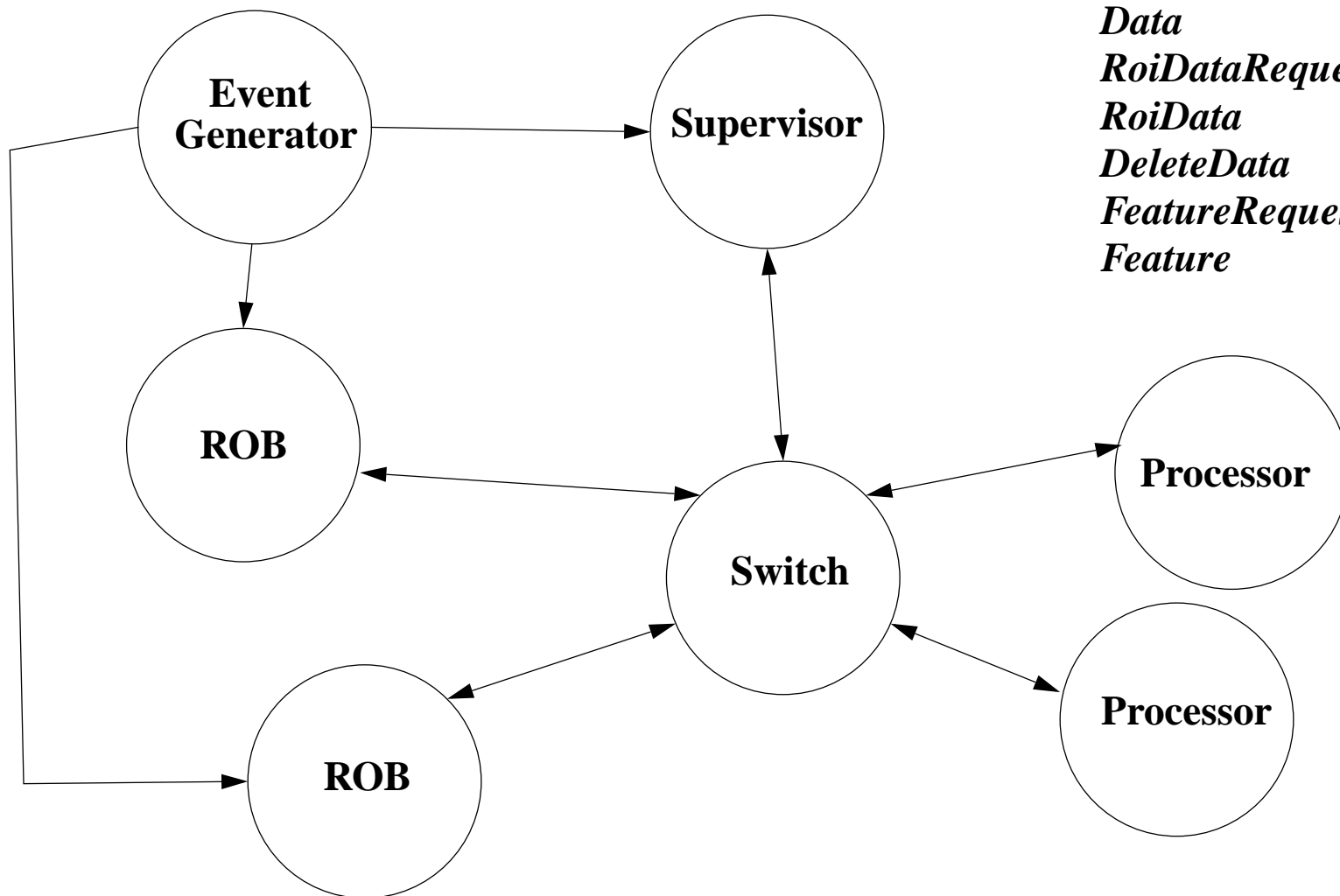
Goal: Simulation of the Pilot Project Ethernet Testbed Program

- Factorised system into a number of “nodes” with well-defined external boundaries
 - Written high level specification documents for each node
 - Used documents to write corresponding Ptolemy code
- Boundaries defined by the messages the node can send and receive
 - Written high level specification document for messages
 - Implemented as a message library written in C++

A Simple Configuration

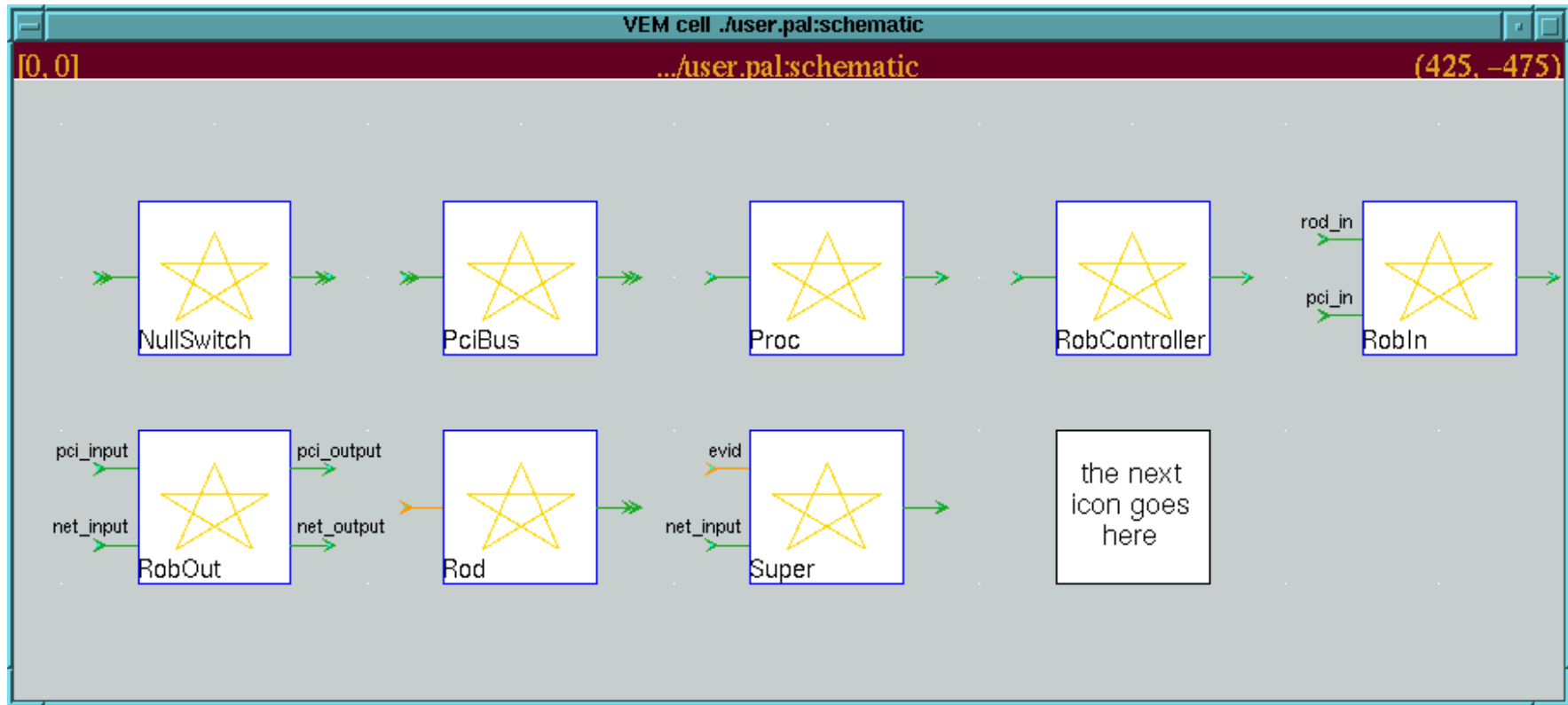
Example Messages

Data
RoiDataRequest
RoiData
DeleteData
FeatureRequest
Feature



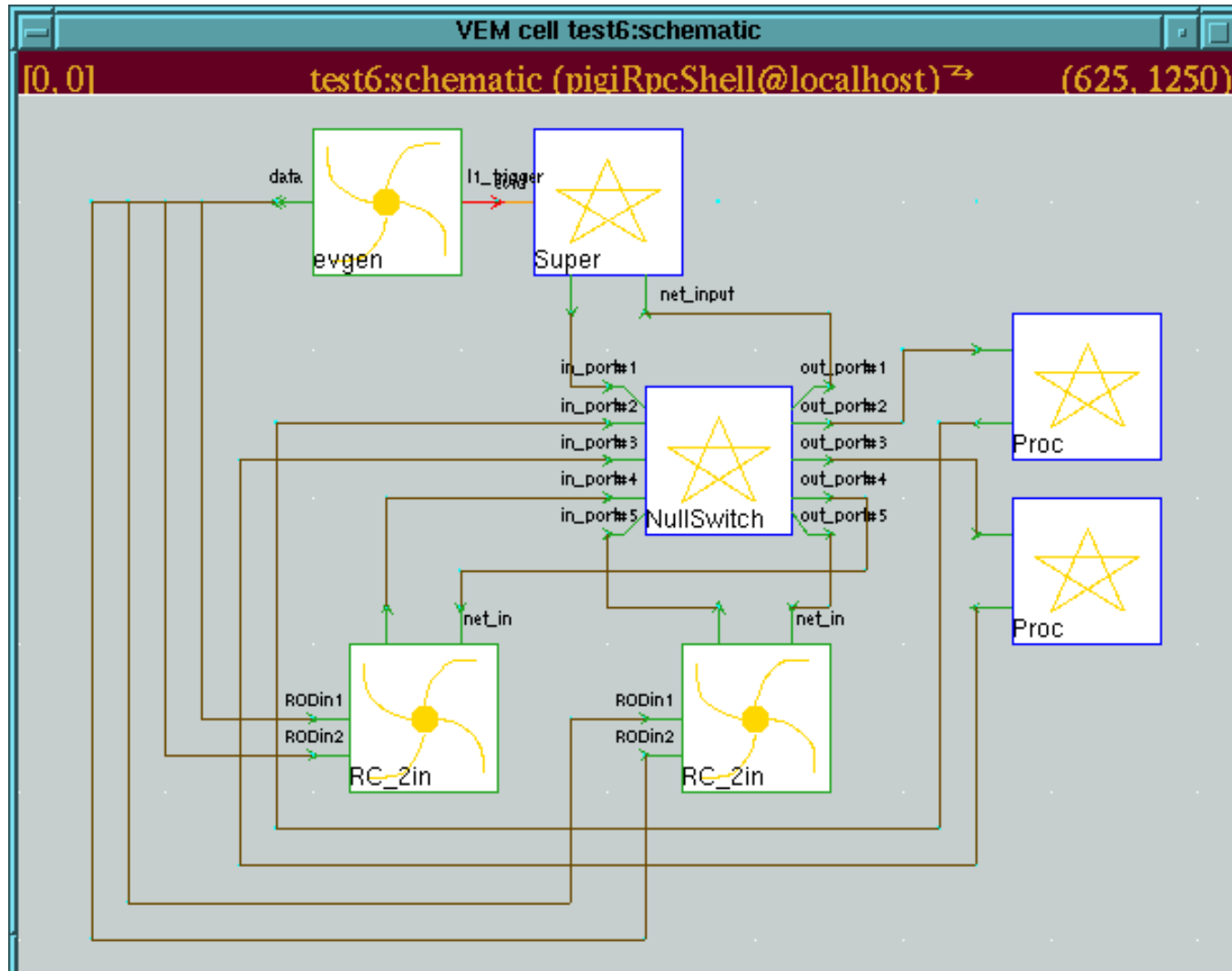
Ptolemy Palette

Nodes are implemented as Ptolemy stars

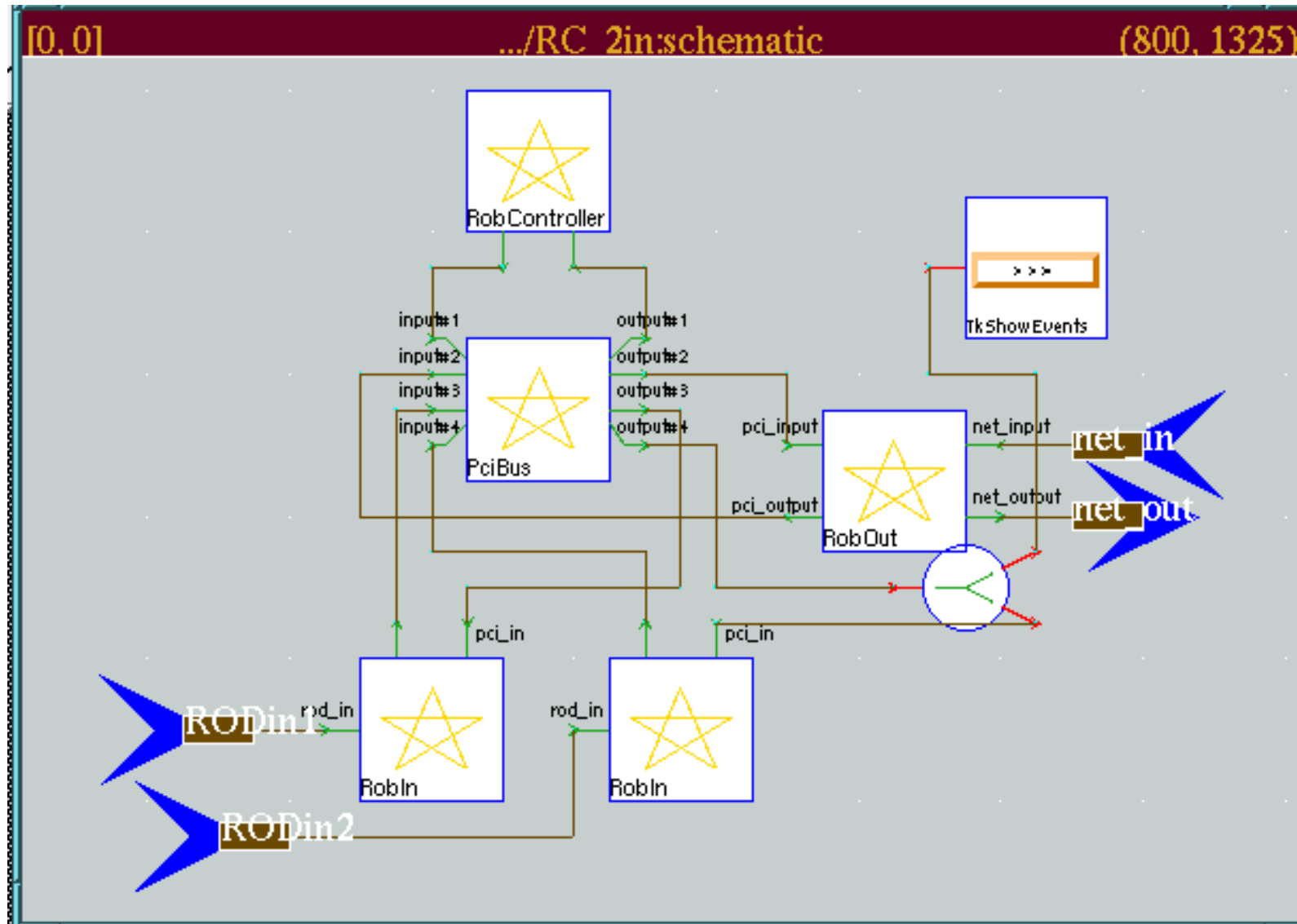


Simple Simulation Configuration

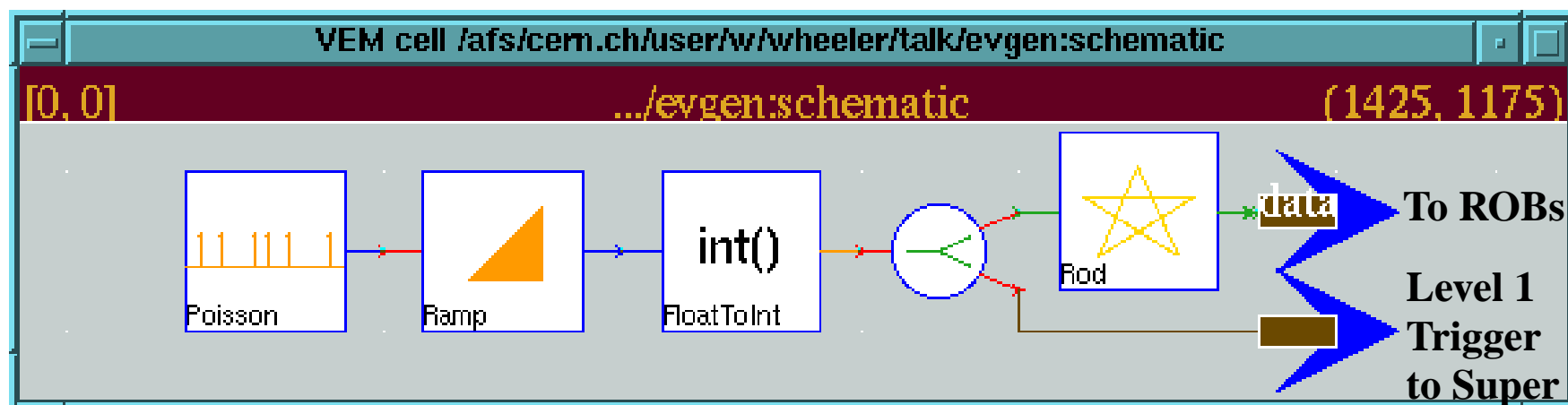
Linked together in Ptolemy to create simple simulation framework



ROB (RC_2in) Galaxy



Evgen Galaxy



Status at Amsterdam

Item	Specification Document	Ptolemy Code	
Message Passing	✓	o	⇒
Switch operation	o	N/A	⇒
ROB	✓	o	⇒
ROBIN	o	×	
ROBOUT	✓	o	
ROBController	✓	o	
Processor/Super	o	×	
PCI Bus	N/A	o	
Ethernet Switch	N/A	×	

✓ = complete, × = essentially not started, o = draft/ongoing.

Status Update

Item	Specification Document	Ptolemy Code	
Message Passing	✓	✓	⇒
Switch operation	o	N/A	⇒
ROB	✓	o	⇒
ROBIN	✓	✓	
ROBOUT	✓	✓	
ROBController	✓	✓	
Steering	×	o	
Feature Extractor	✓	o	
PCI Bus	N/A	✓	
Ethernet Switch	N/A	o	

✓ = complete, × = essentially not started, o = draft/ongoing

Web Page

Full status of project *and* all necessary info to run simulation on Web at:

<http://www.hep.ucl.ac.uk/atlas/simulation/>

Includes:

- High Level Specification for nodes
- Ptolemy Code for nodes
- Message library code and documentation
- Schematics for simple simulation
- Workplans etc...

Overview document on web page available for inclusion in MWD

Web Page

Netscape: ATLAS Level 2 trigger Ptolemy simulation

File Edit View Go Communicator Help

Back Forward Reload Home Search Guide Print Security Stop

Bookmarks Location: <http://www.hep.ucl.ac.uk/atlas/simulation/>

Internet Lookup New&Cool

Nodes

High level specification* documents, specific implementation descriptions and code are listed below

Item	Brief description	H.L. Specification	Implementation description	Code
ROB	Simple ROB which does not differentiate between concept of ROBIN and ROB-Complex	*	?	?
ROBIN	ROBIN part of ROB-Complex	*	*	*
ROBOUT	ROBOUT part of ROB-Complex	*	*	*
ROB Controller	ROB Controller part of ROB-Complex	*	*	*
FEX Processor	Processor to deal with ROI feature extraction	*	?	?

Transport

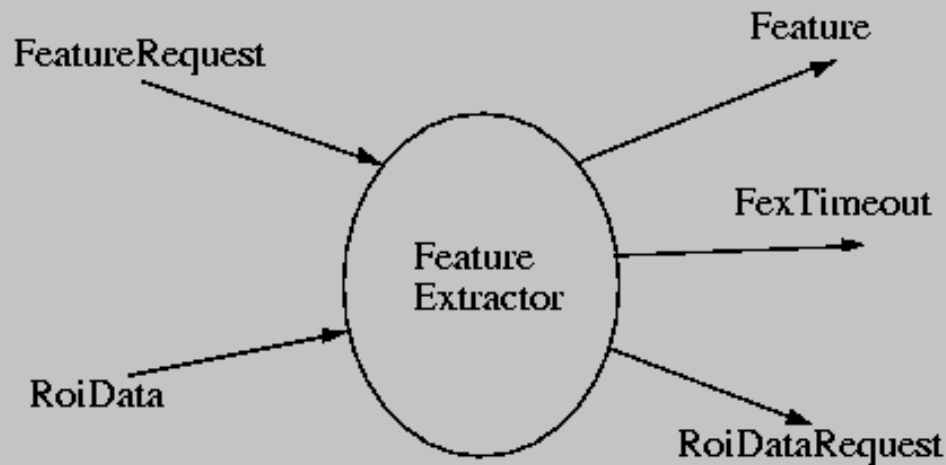
Implementation descriptions and code are listed below

Item	Implementation description	Code	Other useful links
Ethernet Switch	?	?	?
PCI Bus	*	* (FeedbackMsg.h, help.h)	?

High Level Specification Document

Message Summary Diagram

(Too much white space again.)



Messages In

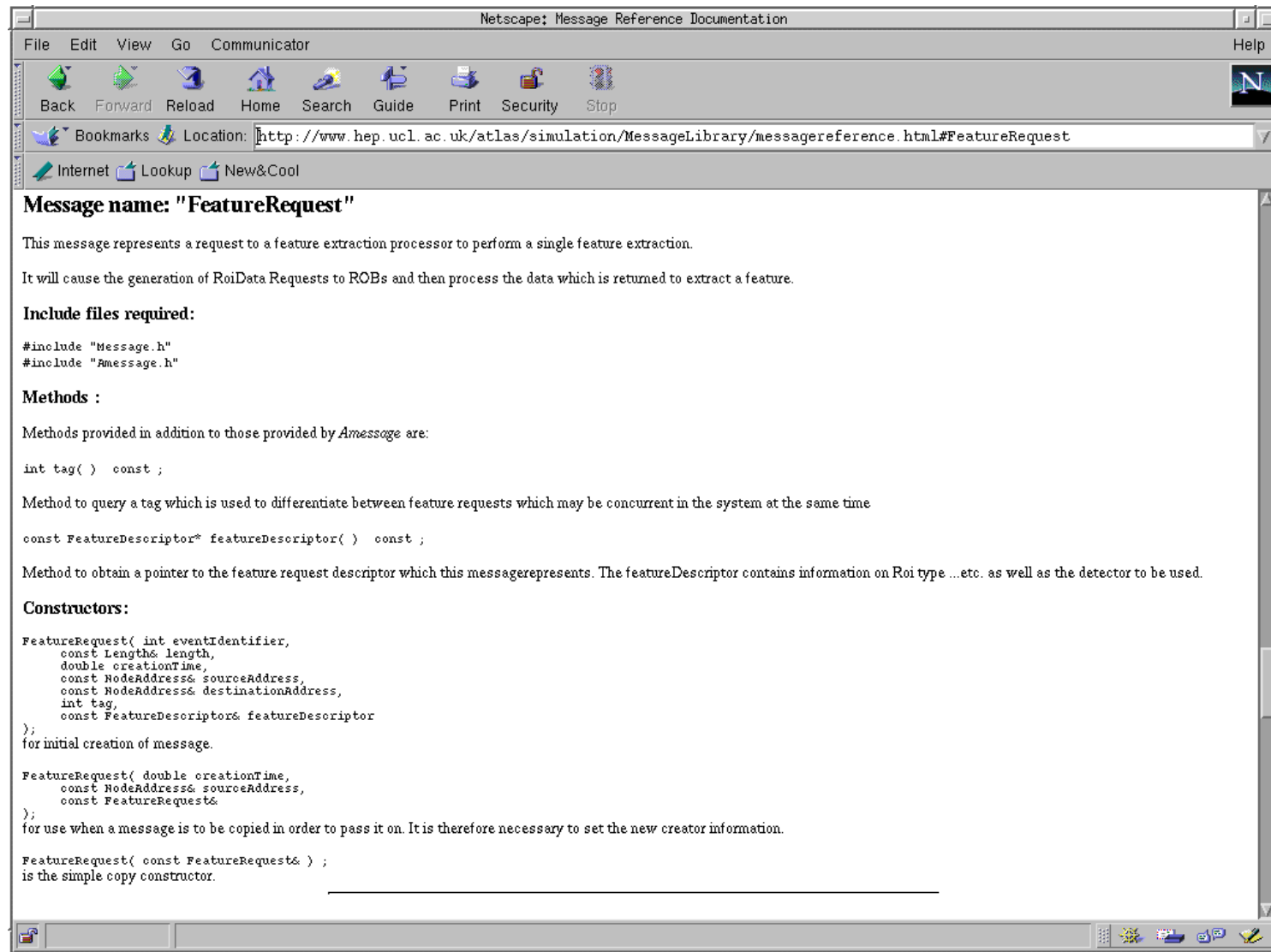
FeatureRequest

(Please put a ref. in for this at UCL) This message is sent to the FEX by the steering node. It is asking the FEX to extract the feature corresponding to the ROI in the message.

Responsibilities:

- Upon reception of this message the FEX goes into the SendRoiDataRequest state.
- A list of the ROBs which cover the region specified by the ROI in the message is obtained.
- An RoiDataRequest message is constructed for each of the ROBs and sent out in turn.

Message Documentation



Conclusions so far

- It works (at CERN, Manchester, UCL)
- Shows we can work together although physically separated
- Goal of prototype configuration has been achieved
 - Organisation of people has been defined
 - Message library provides well-defined interface between nodes (like an API)
 - Connectivity issues have been investigated and resolved

Future Work

- Big effort on parallel work with Ethernet Testbed
- Detailed understanding of reference software to refine nodes
- Tune/calibrate nodes on a simple configuration
- Use model to predict behaviour of larger system and make comparison - hence gaining faith in the ability to scale to even larger systems