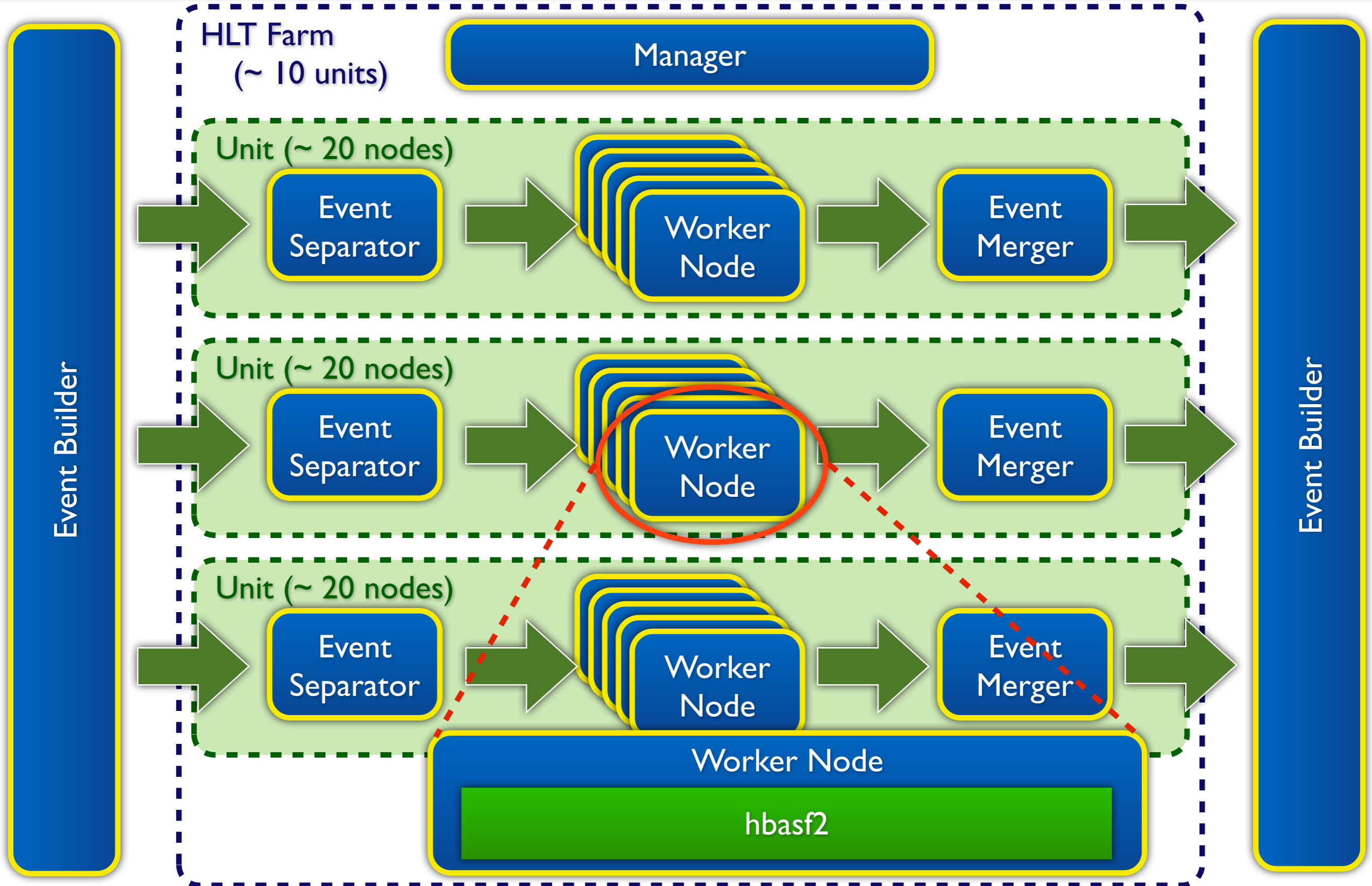


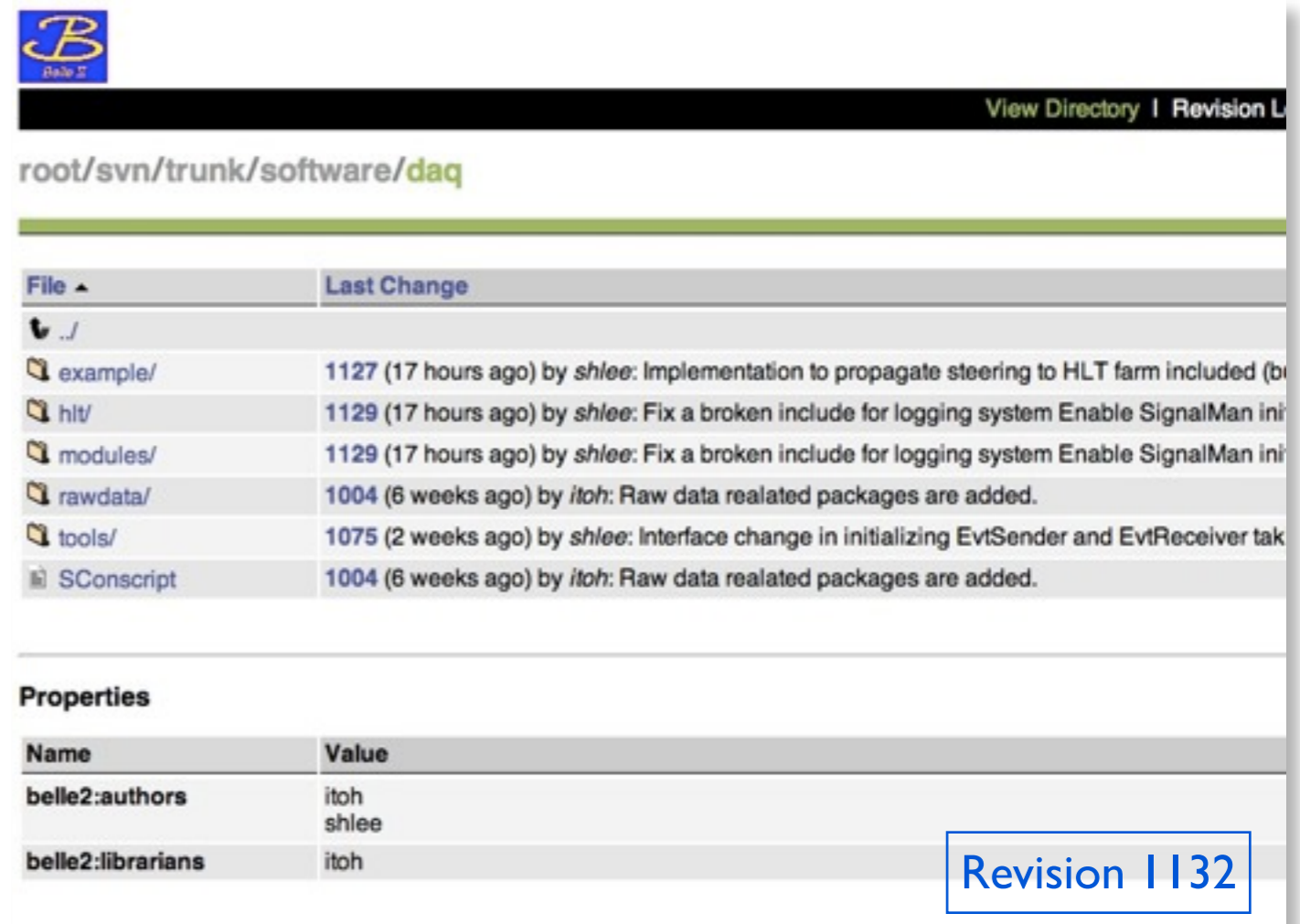
HLT Management

*Belle II Trigger/DAQ Workshop, Jan 25-27 2011
Zhongguanyuan Global Village, PKU
Soohyung Lee (Korea University)*





- hbasf2: Super-framework supposed to be used in HLT
- Features
 - Data transferring via network
 - Node management/monitoring
- Part of DAQ package
 - daq/hlt: main components
 - daq/tools: hbasf2 source code
- Two running modes
 - Manager mode: for manager node
 - Process mode: for event separator/worker node/event merger
- The implementation is still going on!



View Directory | Revision L

root/svn/trunk/software/daq

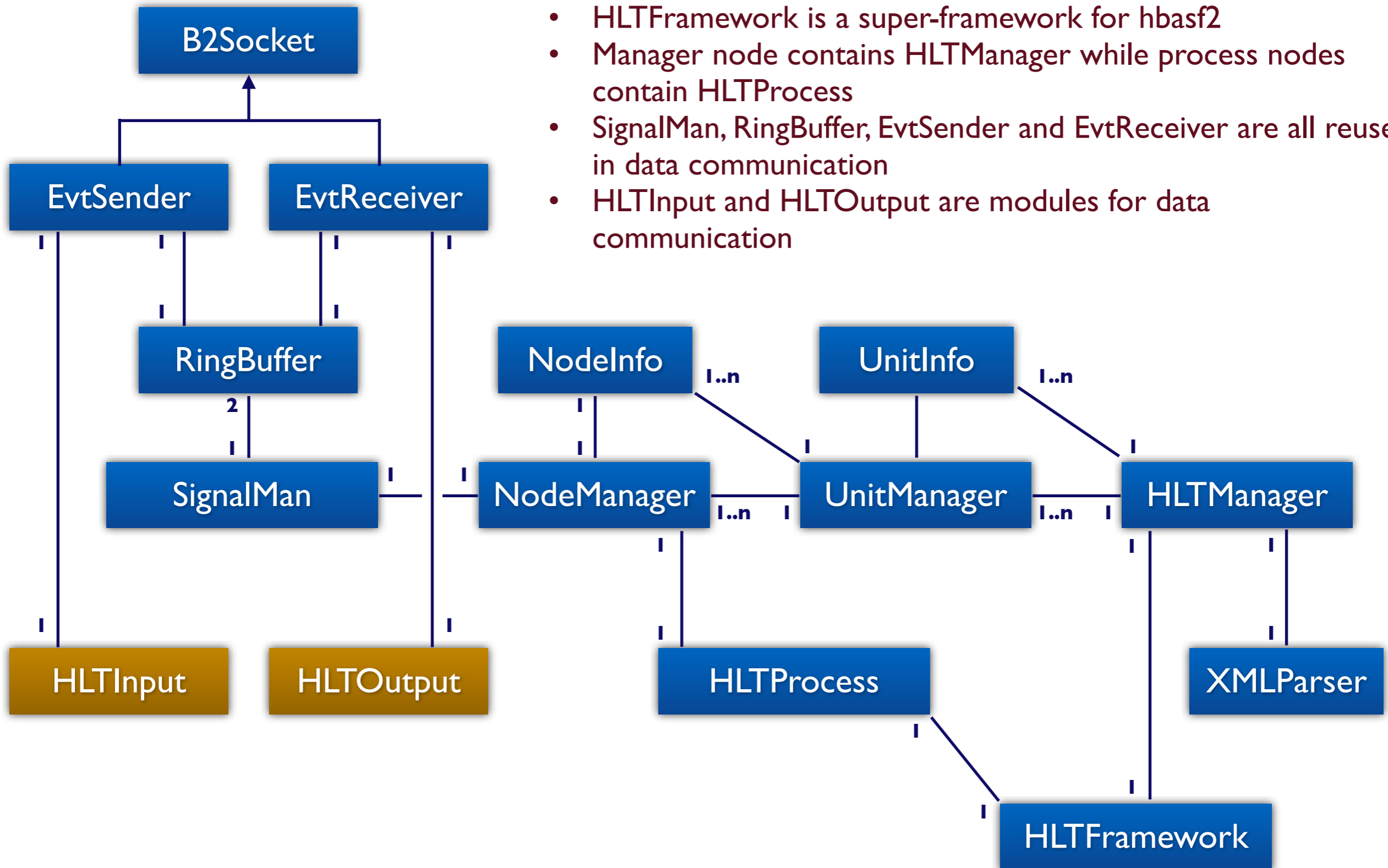
File ^	Last Change
./	
example/	1127 (17 hours ago) by shlee: Implementation to propagate steering to HLT farm included (b
hlt/	1129 (17 hours ago) by shlee: Fix a broken include for logging system Enable SignalMan ini
modules/	1129 (17 hours ago) by shlee: Fix a broken include for logging system Enable SignalMan ini
rawdata/	1004 (6 weeks ago) by itoh: Raw data realated packages are added.
tools/	1075 (2 weeks ago) by shlee: Interface change in initializing EvtSender and EvtReceiver tak
SConscript	1004 (6 weeks ago) by itoh: Raw data realated packages are added.

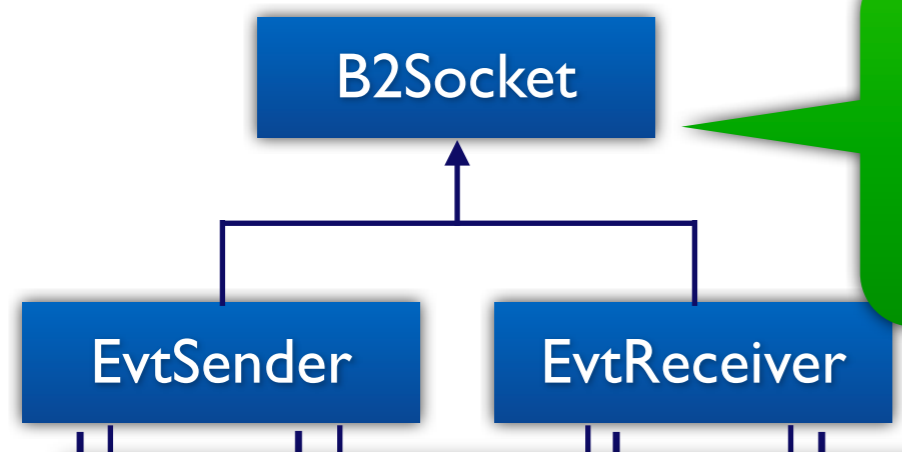
Properties

Name	Value
belle2:authors	itoh shlee
belle2:librarians	itoh

Revision 1132

- HLTFramework is a super-framework for hbasf2
- Manager node contains HLTManager while process nodes contain HLTProcess
- SignalMan, RingBuffer, EvtSender and EvtReceiver are all reused in data communication
- HLTInput and HLTOutput are modules for data communication





Provides functions for the communication
Based on IPv4 for now but should support both IPv4 and IPv6

- HLTInput and HLTOutput are modules for data communication

2
cess nodes
er are all reused

Feature #28 Update Watch Duplicate

B2Socket IPv6 support

Added by Soohyung Lee 7 days ago. Updated 6 days ago.

Status:	In Progress	Start Date:	01/17/2011
Priority:	Normal	Due date:	01/31/2011
Assigned to:	Soohyung Lee	% Done:	<input type="checkbox"/> 10%
Category:	daq		
Target version:	-		

Description Quote

As we would like to take advantages from IPv6, B2Socket should support it. DAQ just needs IPv6 only but it should support IPv4 as well for the application of the network-based parallel processing.

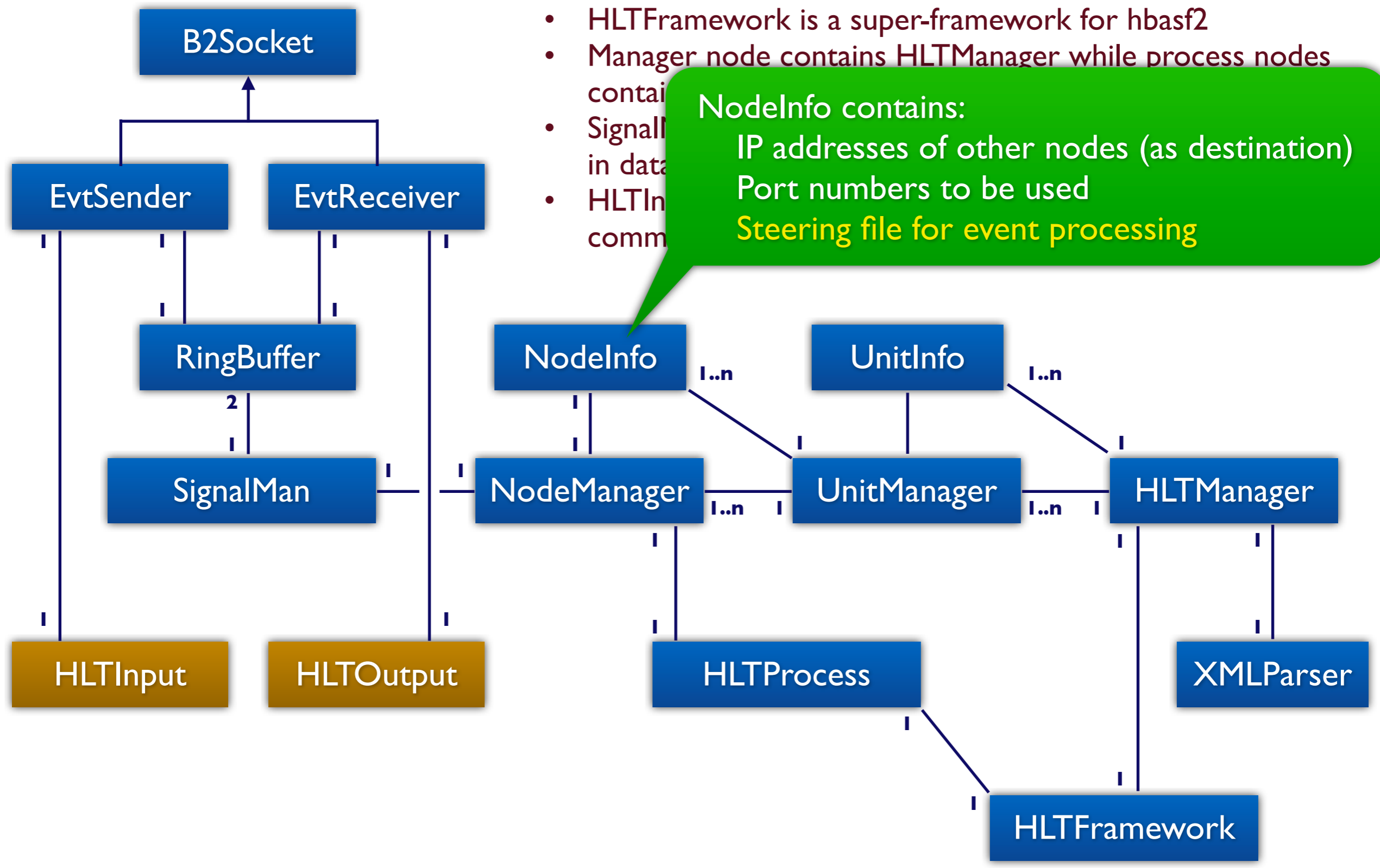
(If this issue is irrelevant for using redmine (I'm new at it!), please don't hesitate to remove this)

Related issues Add

On my "to-do list" as issue #28

- HLTFramework is a super-framework for hbasf2
- Manager node contains HLTManager while process nodes contain HLTProcess
- SignalMan handles data transfer between nodes
- HLTIn and HLTOut handle communication with B2Socket

NodeInfo contains:
 IP addresses of other nodes (as destination)
 Port numbers to be used
 Steering file for event processing



- Starting with:

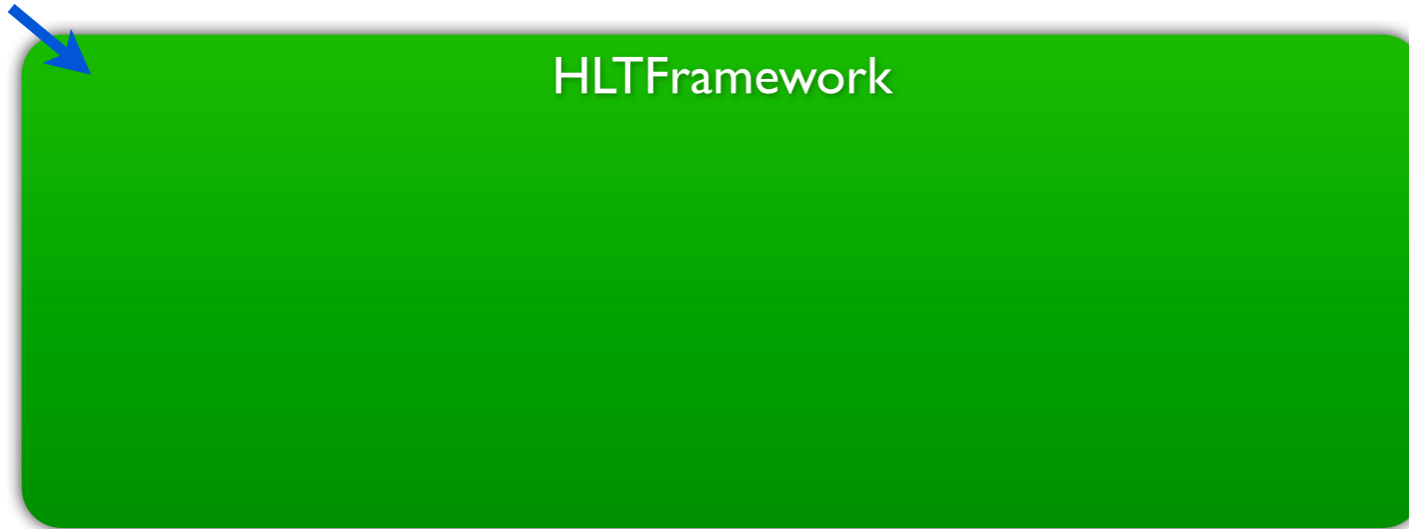
```
<?xml version="1.0" encoding="UTF-8"?>
<HLT>
  <Name>Belle II High Level Trigger Test Bench</Name>
  <Description>For the test of hbasf2</Description>
  <ExpNo>55</ExpNo>
  <RunStart>1</RunStart>
  <RunEnd>100</RunEnd>
  <Steering>doEventReduction.py</Steering>
  <Manager>170.22.200.161</Manager>
  <Unit no="1">
    <ES>170.22.200.162</ES>
    <WN no="1">170.22.200.163</WN>
    <WN no="2">170.22.200.164</WN>
    <WN no="3">170.22.200.165</WN>
    <WN no="4">170.22.200.166</WN>
    <EM>170.22.200.167</EM>
  </Unit>
</HLT>
```



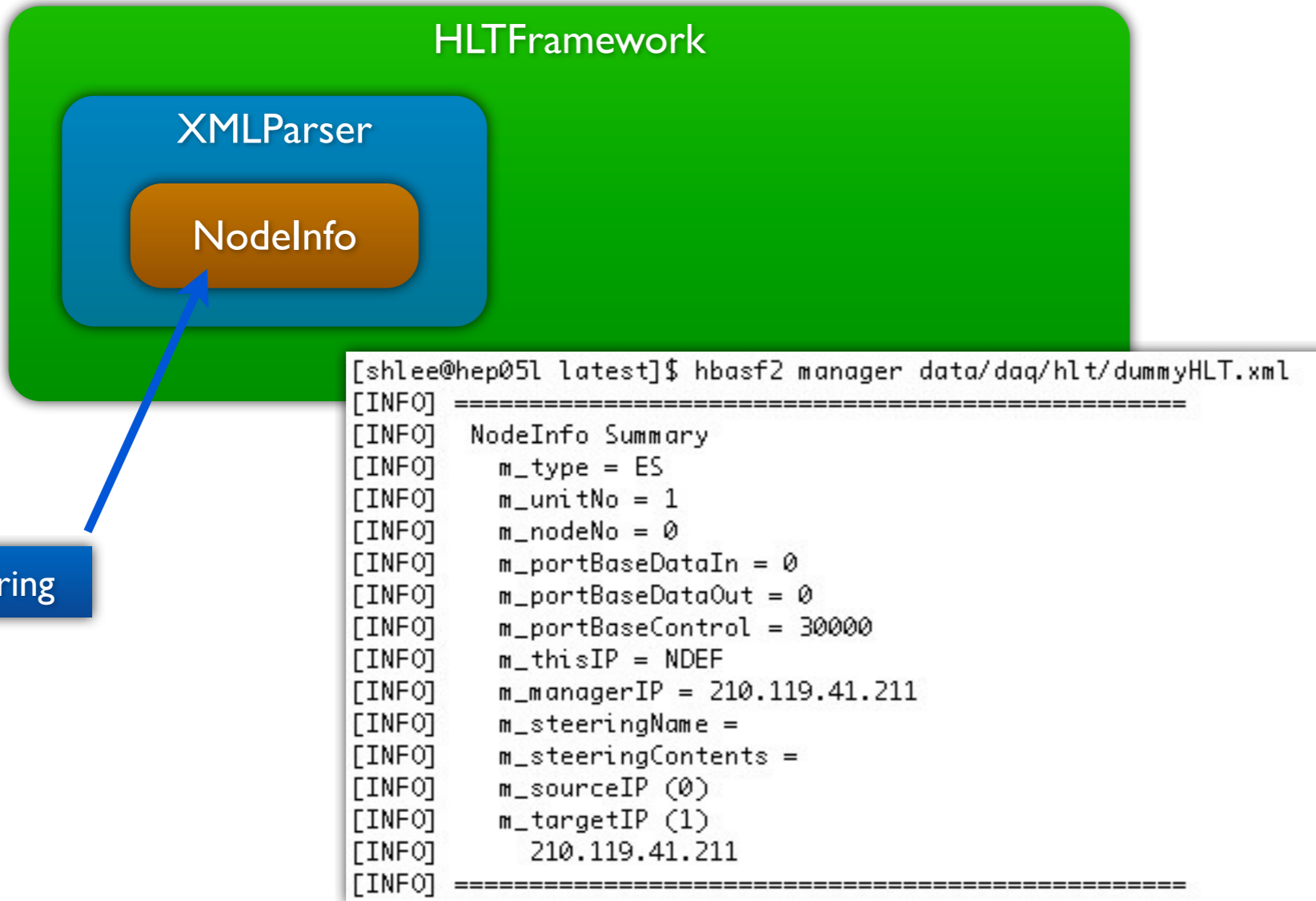
- Starting with:

▶ \$ hbasf2 manager <input XML>

XML

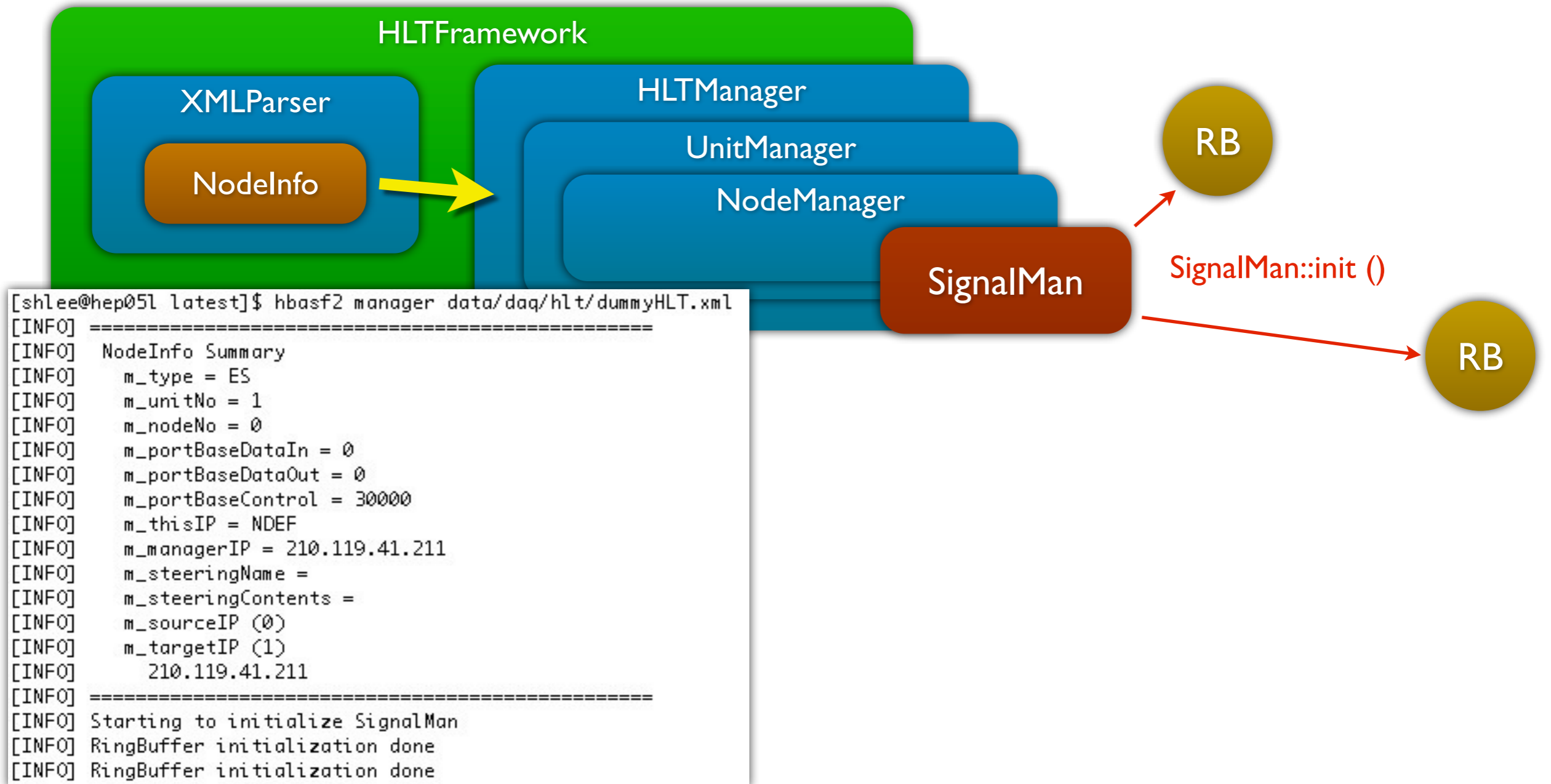


- Starting with:
 - \$ hbasf2 manager <input XML>

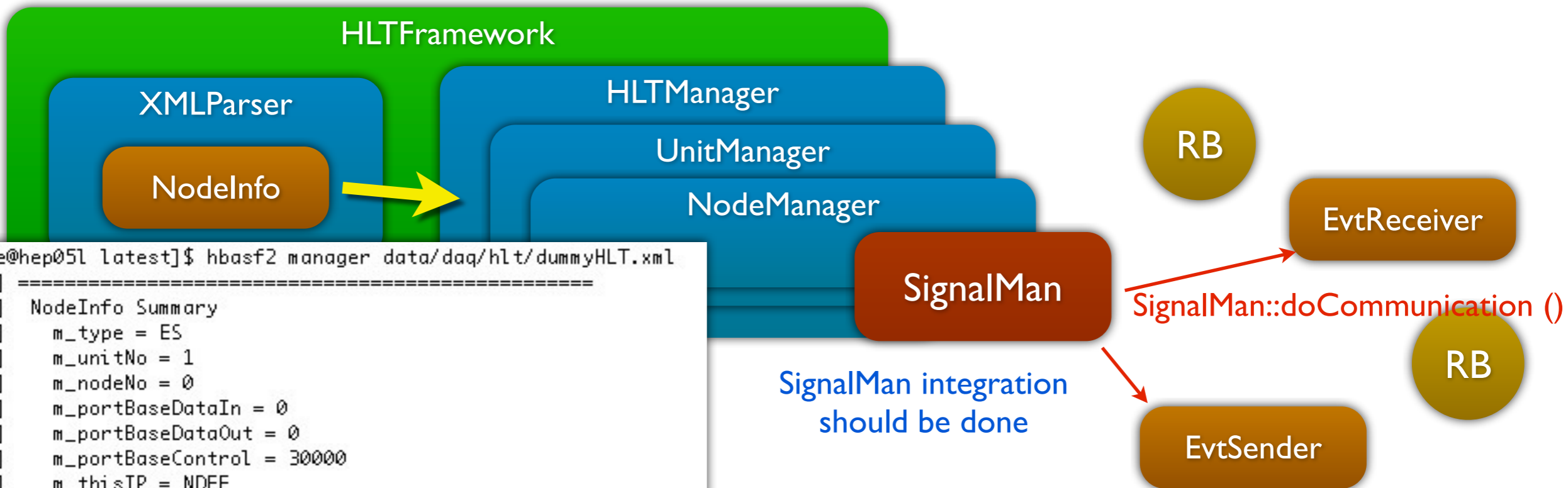


Steering

- Starting with:
 - \$ hbasf2 manager <input XML>



- Starting with:
 - \$ hbasf2 manager <input XML>



```
[shlee@hep051 latest]$ hbasf2 manager data/daq/hlt/dummyHLT.xml
[INFO] =====
[INFO] NodeInfo Summary
[INFO]   m_type = ES
[INFO]   m_unitNo = 1
[INFO]   m_nodeNo = 0
[INFO]   m_portBaseDataIn = 0
[INFO]   m_portBaseDataOut = 0
[INFO]   m_portBaseControl = 30000
[INFO]   m_thisIP = NDEF
[INFO]   m_managerIP = 210.119.41.211
[INFO]   m_steeringName =
[INFO]   m_steeringContents =
[INFO]   m_sourceIP (0)
[INFO]   m_targetIP (1)
[INFO]     210.119.41.211
[INFO] =====
[INFO] Starting to initialize SignalMan
[INFO] RingBuffer initialization done
[INFO] RingBuffer initialization done
[INFO] Manager node initialized
[INFO] Manager node terminates...
[INFO] EvtReceiver initialized
[INFO] Initializing EvtSender...
[INFO] EvtSender initialized
```

Starting to broadcast NodeInfo to all nodes assigned

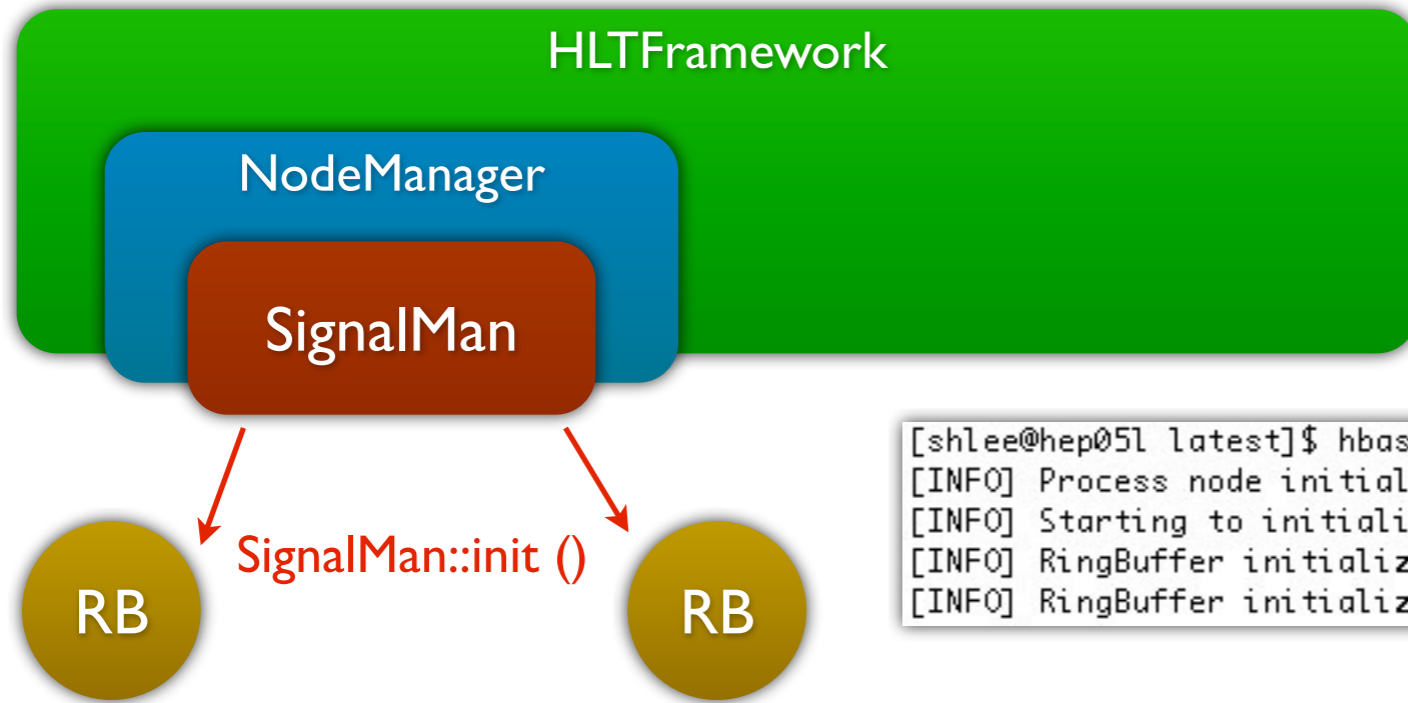
- Starting with:
 - ▶ \$ hbasf2 node



HLTFramework

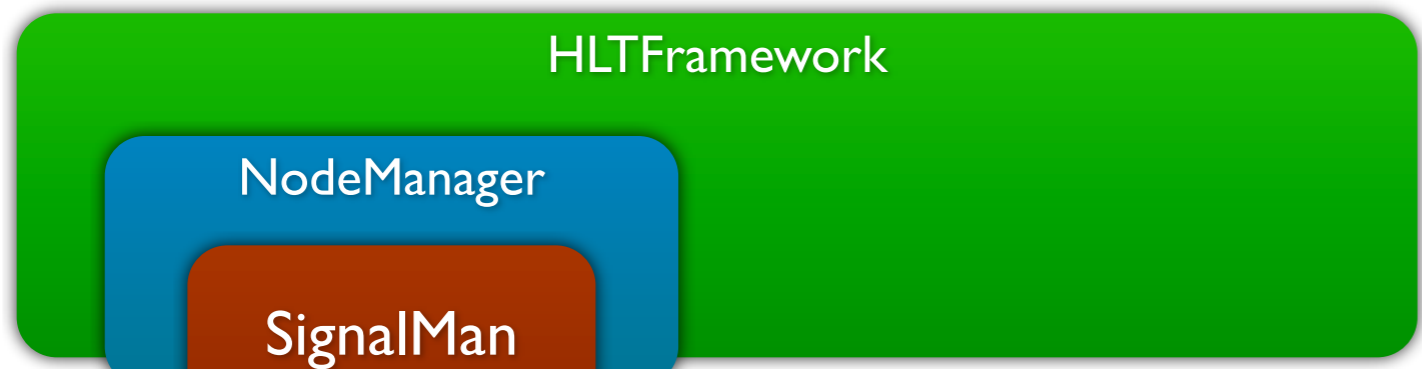
```
[shlee@hep051 latest]$ hbasf2 node  
[INFO] Process node initializing
```

- Starting with:
 - \$ hbasf2 node

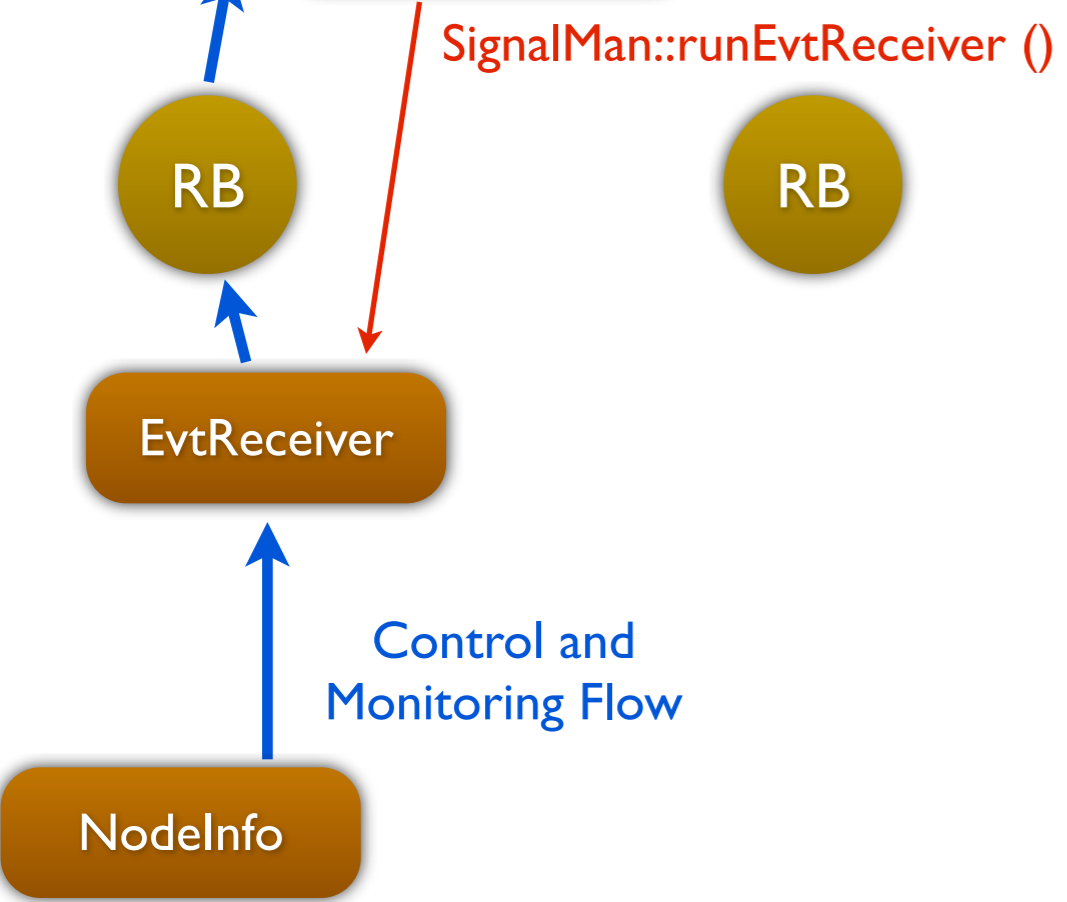


```
[shlee@hep05l latest]$ hbasf2 node  
[INFO] Process node initializing  
[INFO] Starting to initialize SignalMan  
[INFO] RingBuffer initialization done  
[INFO] RingBuffer initialization done
```

- Starting with:
 - \$ hbasf2 node

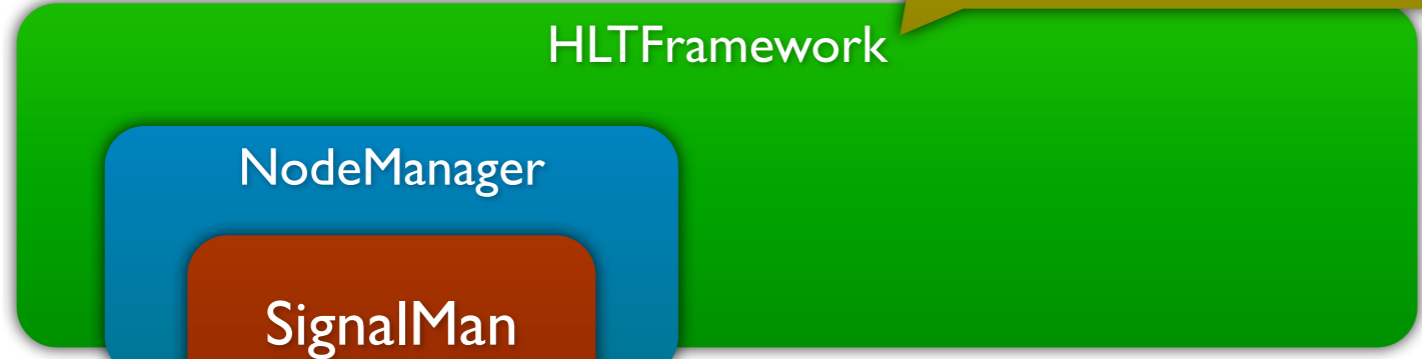


```
[shlee@hep05l latest]$ hbasf2 node  
[INFO] Process node initializing  
[INFO] Starting to initialize SignalMan  
[INFO] RingBuffer initialization done  
[INFO] RingBuffer initialization done  
[INFO] Retrieving node information from manager node...  
[INFO] EvtReceiver initialized
```

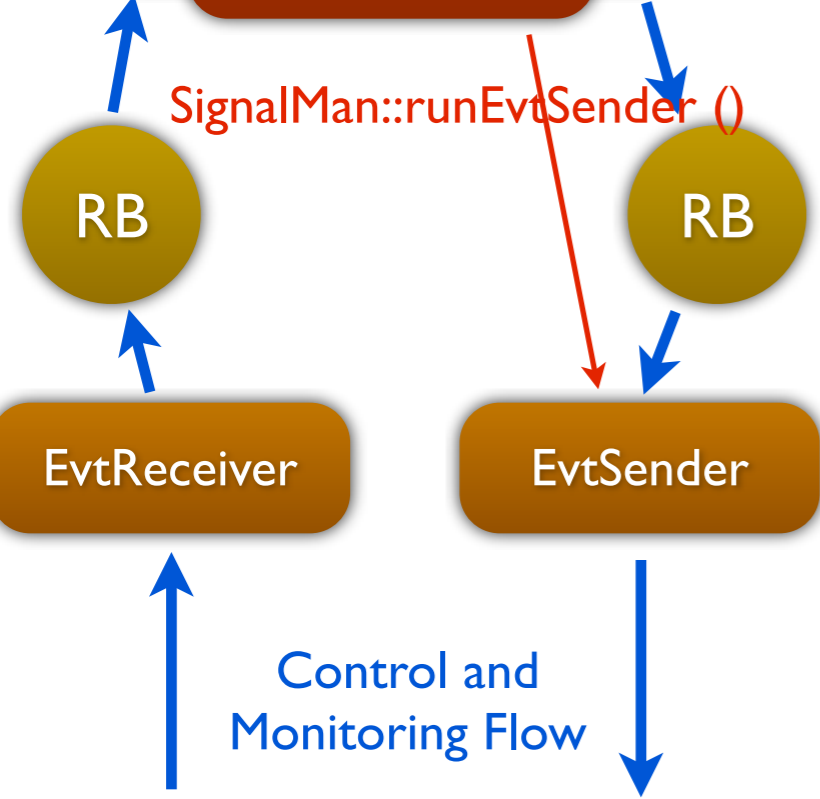


- Starting with:
 - \$ hbasf2 node

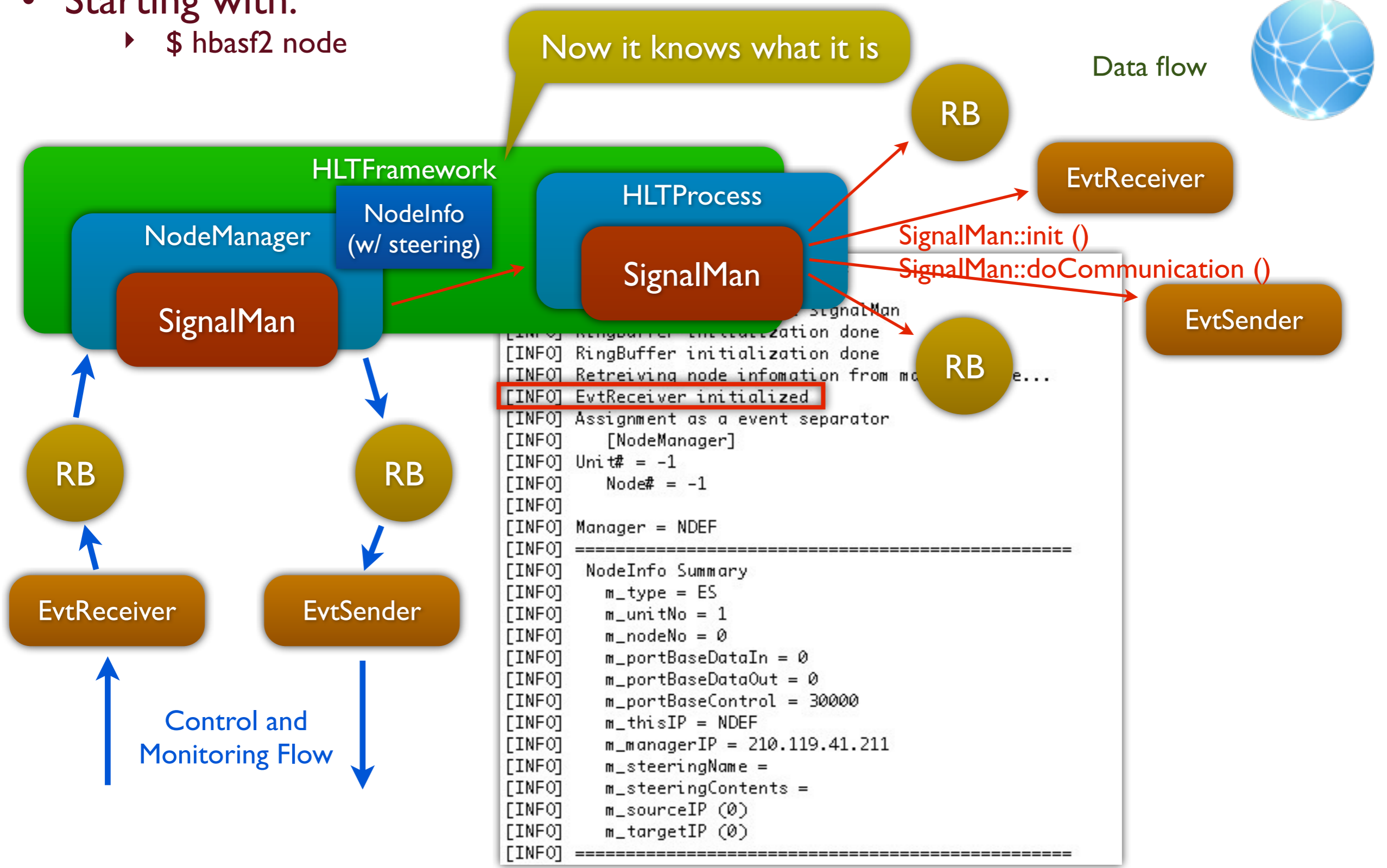
The node doesn't know what it actually is at this moment. It can be a event separator, worker node, or event merger.



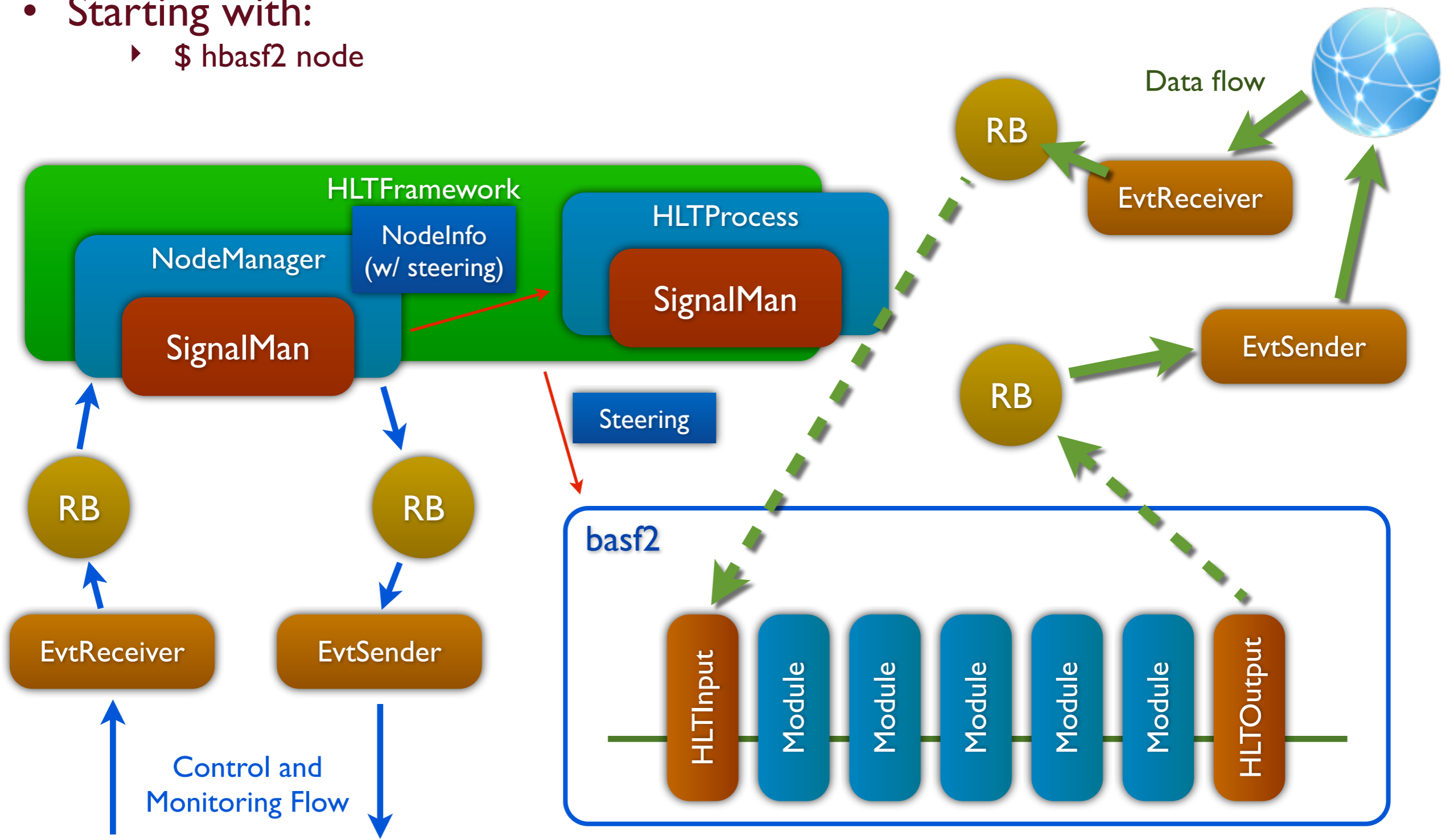
```
[shlee@hep05l latest]$ hbasf2 node
[INFO] Process node initializing
[INFO] Starting to initialize SignalMan
[INFO] RingBuffer initialization done
[INFO] RingBuffer initialization done
[INFO] Retrieving node information from manager node...
[INFO] EvtReceiver initialized
```

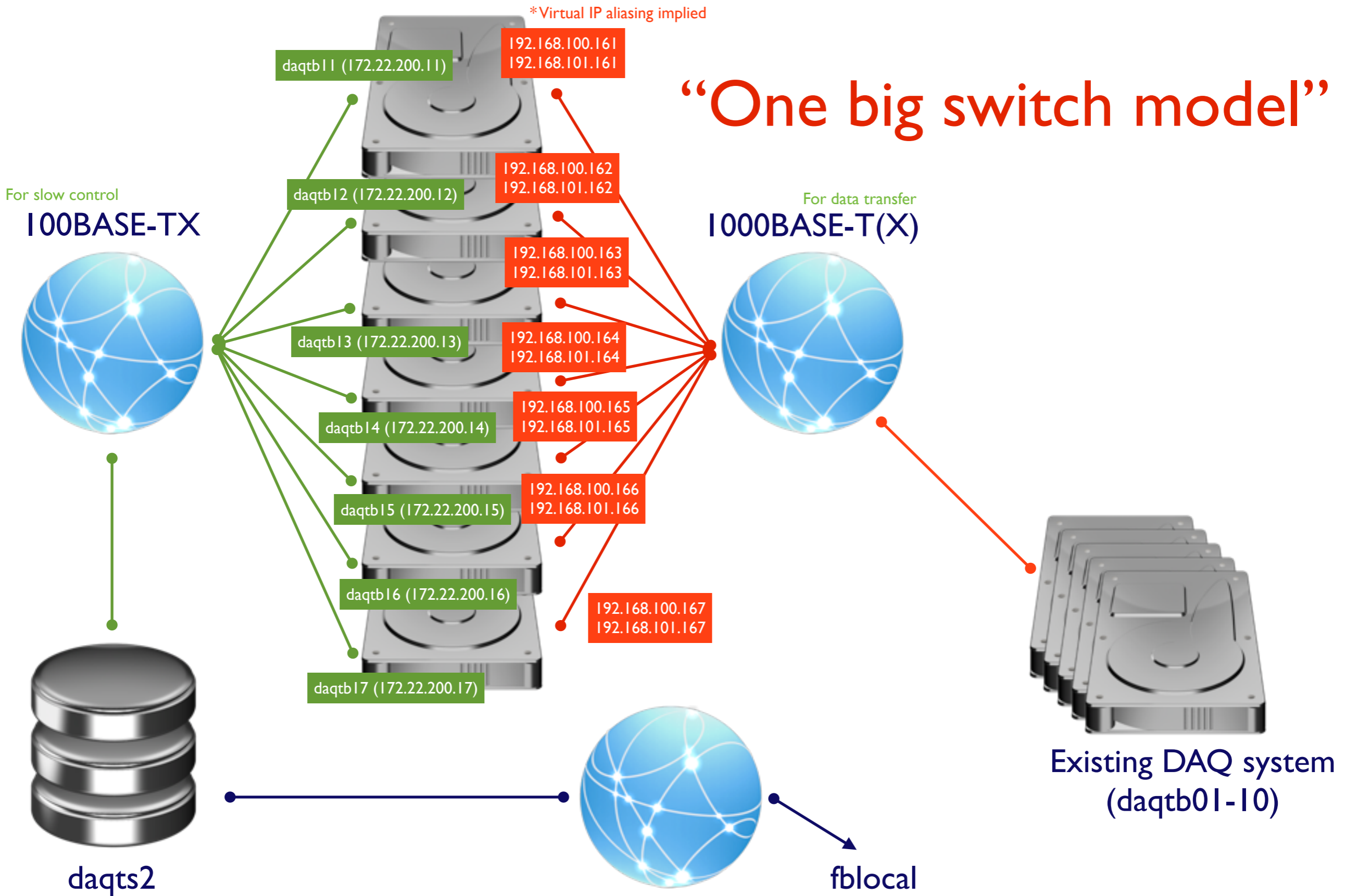


- Starting with:
 - \$ hbasf2 node



- Starting with:
 - \$ hbasf2 node





- To maximize throughput, the most advanced network equipment is required
 - 1000BASE-T(X) for the management and the monitoring
 - 10GbE for the data communication

- Recent cost estimation of the switch (made for Belle II event builder) shows that
 * ~100 ports 10GbE switch costs > 5000 man yen = 0.5M\$

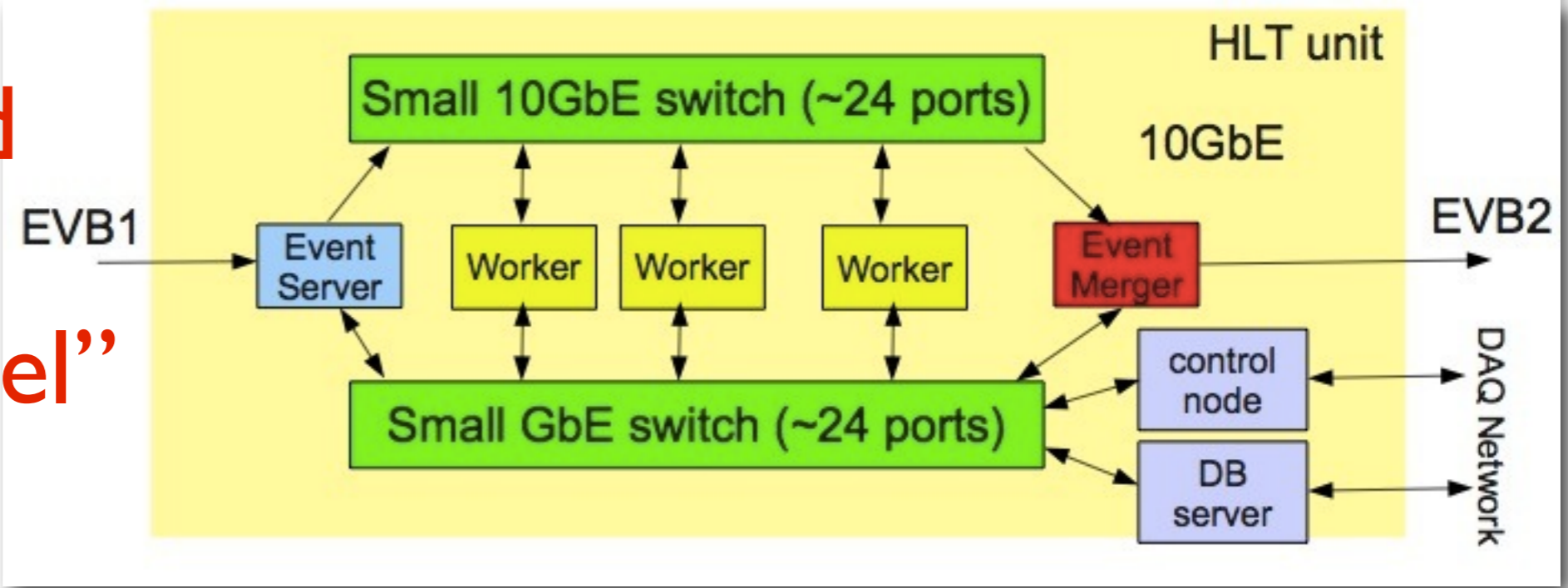
- Considering the redundancy for the back up, we need at least two units which costs 1M\$.

-> Apparently it is not affordable.

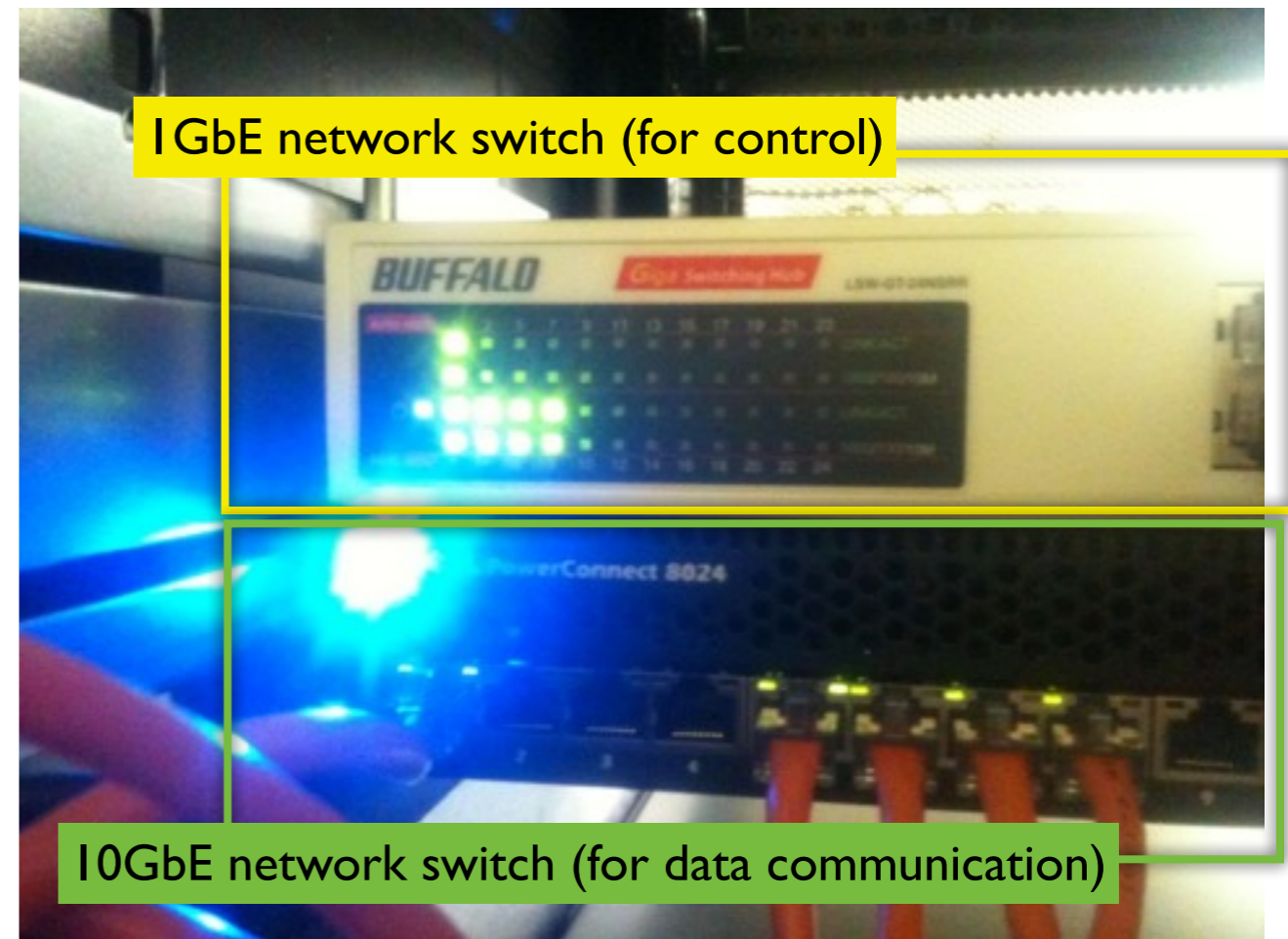
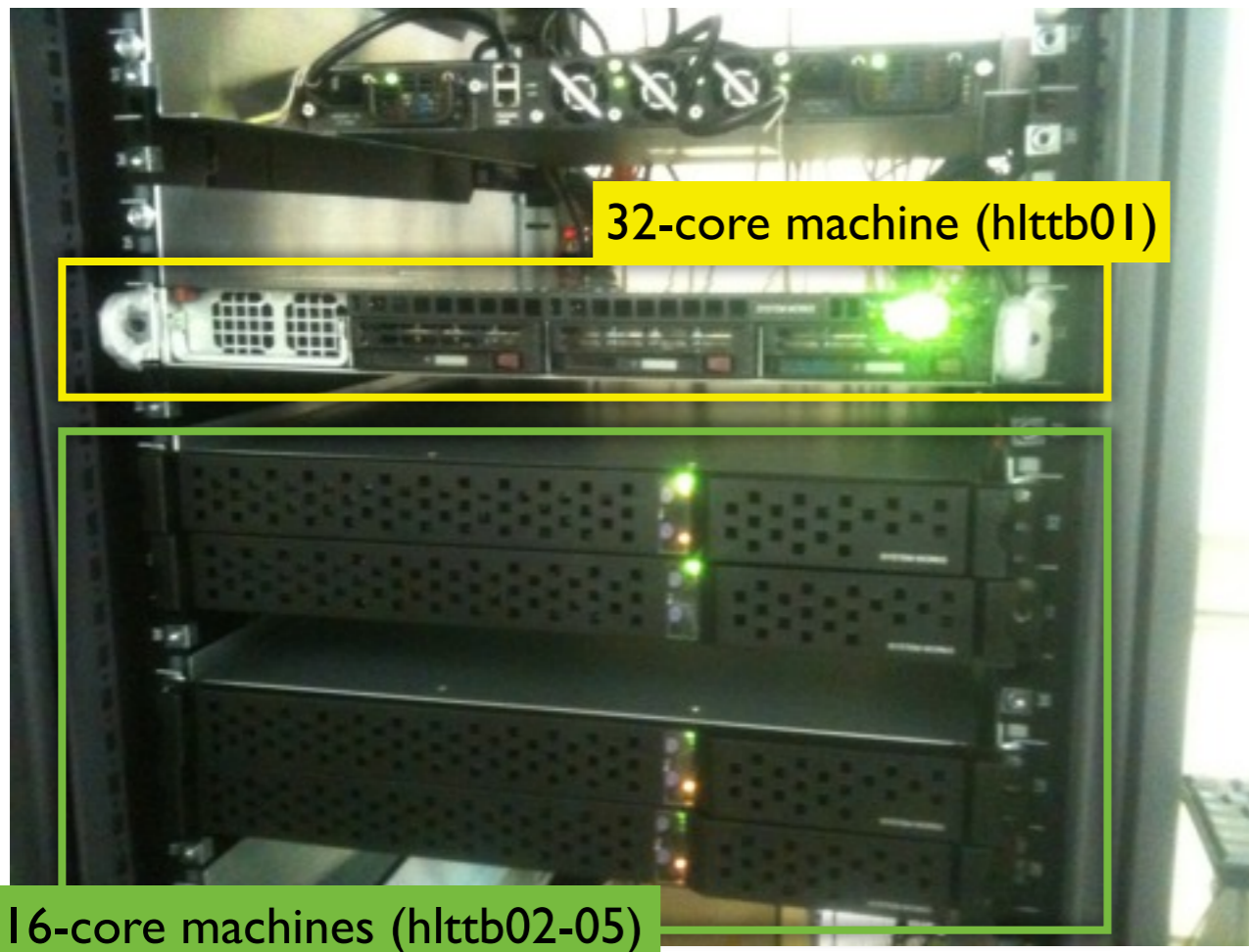
R. Itoh, HLT meeting

- A small 10GbE switch is much cheaper.
 Ex. Dell's PowerConnect 8024 (24port 10GbE-T)
 -> ~100 man yen = 10k\$

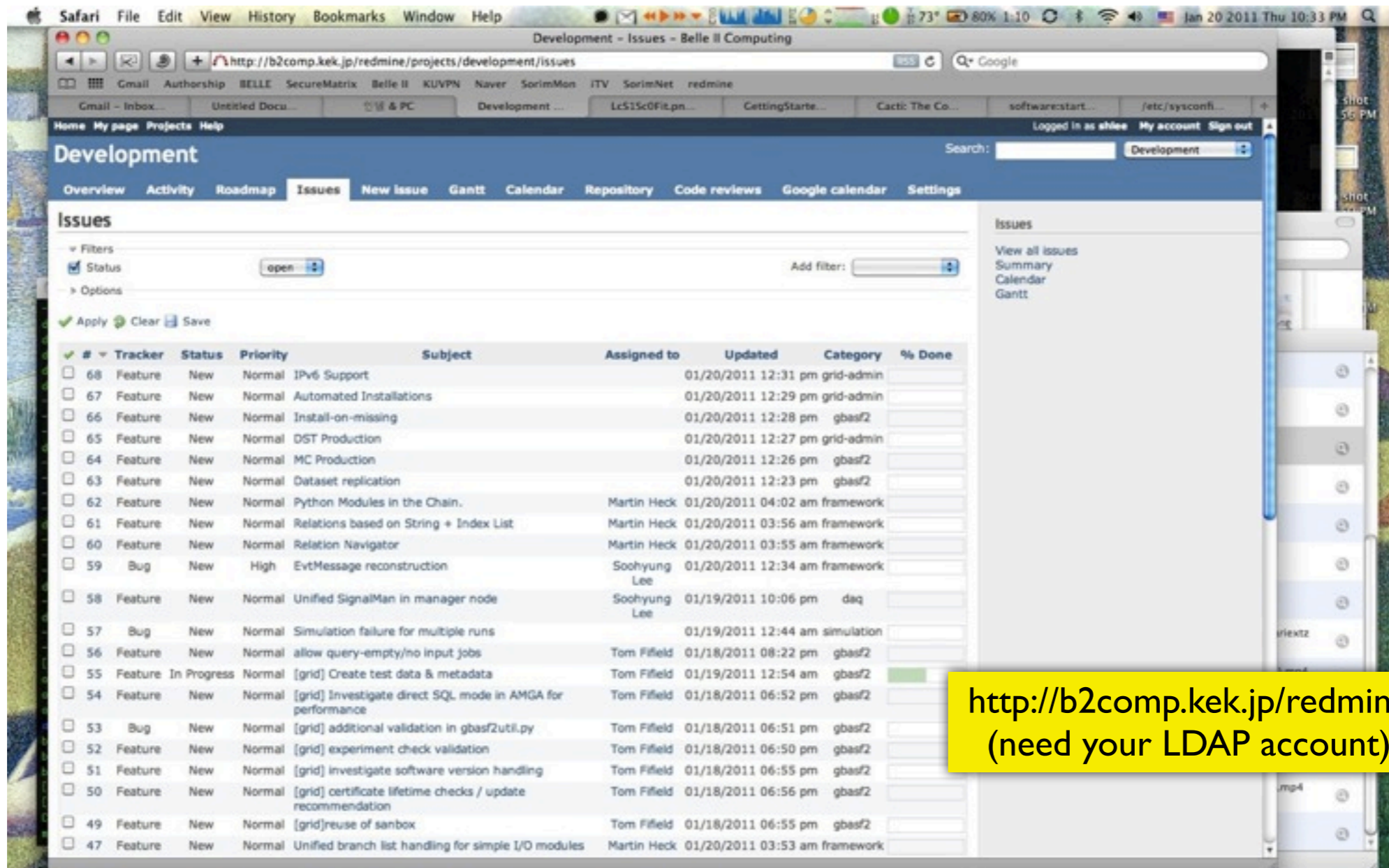
“Unit-based many small switches model”



- Test bench configuration has been revised
 - Old HLT farm (recycled): daqtb01-10 (10 machines)
 - Backups (recycled): daqtb11-17 (7 machines)
- New test bench which is more realistic (and powerful!) has been built
 - 1 32-core / 4 12-core machines
 - 10GbE network connection for the data communication



- Belle II computing group open an issue tracker, redmine
- This might be very helpful to manage further development
 - Please find out the latest issues and bugs on the implementation
 - Any bug reporting or new issues are very welcome



<http://b2comp.kek.jp/redmine>
(need your LDAP account)

- Design and partial implementation of hbasf2 has been done
 - All related components (i. e. ring buffers) are initialized and managed by hbasf2
 - Data I/O will be done by modules
- Implementing, enhancing, and debugging the details
 - Process termination
 - Exception control
 - Resource selection
 - XML builder based on GUI
- About to start designing the monitoring system
 - What variables we need (logging, histogramming,)
 - How it shows (external application, web,)
 - How to monitor (as a module or native feature of hbasf2)
 - Error recovery

- hbasf2
 - Super-framework to manage HLT
 - The same components with data communication are recycled for the management
 - Has two modes: Manager and Process
 - HLT information are feed as XML
 - Steering scripts to use basf2 are also propagated
- Network configuration
 - IPv6 is being considered
 - Unit-based small switches model is being considered
- Test bench
 - Previous test bench is set up again
 - More realistic new test bench has been set up

