# ForCES LFB Library
# <draft-ietf-forces-lfb-lib-00 >


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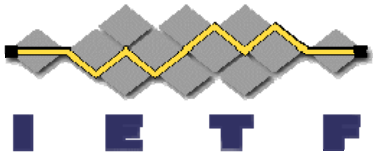


# Draft Status

- Initial draft
- Rough merge of two documents and new contributions from authors
  - draft-dong-forces-lfblib-00
  - draft-halpern-forces-lfblibrary-base-00
- More editorial work to be done
  - Better text organization.
  - Better descriptions on the design logics of the LFBs.
- More issues to be settled
  - Need to review and modify LFB components etc. one by one
- LFB use cases to be done

# Draft Contents

- Base definitions
  - frame types
  - data types
  - metadata types
- Descriptions of 29 LFBs grouped into 6 categories by functionality
  - Core LFBs
  - Port LFBs
  - Address LFBs
  - Forwarding LFBs
  - Queue manager and scheduler LFBs
  - Miscellaneous LFBs
- Complete XML definitions of the library
  - Already over 60 pages of text

# Types Definitions

- Frame types defined, like
  - EthernetII - An Ethernet II frame type.
- Based on base atomic data types defined by FE model, new data types defined, such as:
  - ifIndex - A Port Identifier.
  - IEEEMAC - IEEE MAC Address.
  - NetSpeedType - Network speed values.
- Meta data types defined, like:
  - ErrorId - Error Type.
  - QueueID - The queue ID
  - NextHopID - An index into a Next Hop entry in Nexthop table
- Need review and modification
- Need more definitions

# LFB Design Logics - Core LFBs

- Referred to ForCES protocol and FE model for the core LFBs
  - FE Object LFB
  - FE Protocol LFB

# LFB Design Logics - Port LFBs

- GenericConnectivityLFB
  - Now it is vacuum in components, may put base and common port components, capabilities, and events into it.
- By inheritance, defined port LFBs for Ethernet, like
  - EtherPort
  - EtherDecap
  - EtherEncap
- Questions and comments:
  - Should the three LFBs be condensed into one  Ethernet port LFB?
  - Joel: When a construct can be and frequently is modeled as two separate pieces, and can also be modeled as one piece, it is probably better to simply model it as two pieces.

# Port LFBs components

| | |
|---|---|
| EtherPort | IfIndex |
| | IfName |
| | LinkSpeed |
| | MTU |
| | OperaStatus |
| | AdminStatus |
| | PromiscuousMode |
| | CarrierStatus |
| | OperMode |
| | SrcNegotiationTypeMACAddr |
| | MacAliasTable |
| | StatsEnable |
| | PortStats |
| EtherEncap | DCHostTablev4/DCHostTablev6 |
| | ArpTable/NbrTable |
| EtherDecap | DispatchTable |

# LFB Design Logics - Address LFBs

- LFBs for address handling tasks such as:
  - ARP
  - IPv6AddrResolution
  - ICMPGenerator
  - ICMPv6Generator
  - IPv4Validator
  - IPv6Validator
- Questions:
  - Should the Validators belong to the Forwarding LFBs group?

# LFB Design Logics - Forwarding LFBs (1)

- The following forwarding LFBs are defined:
  - IPv4UcastLPM
  - IPv4NextHopApplicator
  - IPv6UcastLPM
  - IPv6UcastNexthopApplicator

# LFB Design Logics - Forwarding LFBs (2)

- Accordingly LFB components defined are
  - Fib
  - PrefixTable
  - NextHopTable
  - LocalIpAddrTable
- Actually two FIB modes applied: integrate mode and diverse mode.
  - Integrate mode FIB: All forwarding information condensed into one FIB entry. (Linux kernel forwarding & Click modular router.)
  - Diverse mode FIB: forwarding information is separated into two tables: Prefix table and Nexthop table, and an index is used to link these two tables. (Intel NP)
- Questions&Comments:
  - Joel: Unless there is a difference in actual functionality, we should not represent the same thing in two different fashions. That makes the job of implementing a CE harder, because it will have to deal with both constructs.

# LFB Design Logics - Queue and scheduler LFBs (1)

- Initial work only
  - Scheduler LFB
    - defined an Input Port group called Watchers to get the queues state they watch, and an Output Port group called Controllers to output control command for the queues
  - Queue LFB
    - Have a packet input, a packet output, a control input, and a group of control outputs.
    - The control ports represent the control relationships with schedulers
  - WRRSched LFB
- Questions:
  - Queue and scheduler have complicated associations, is the current method valid?

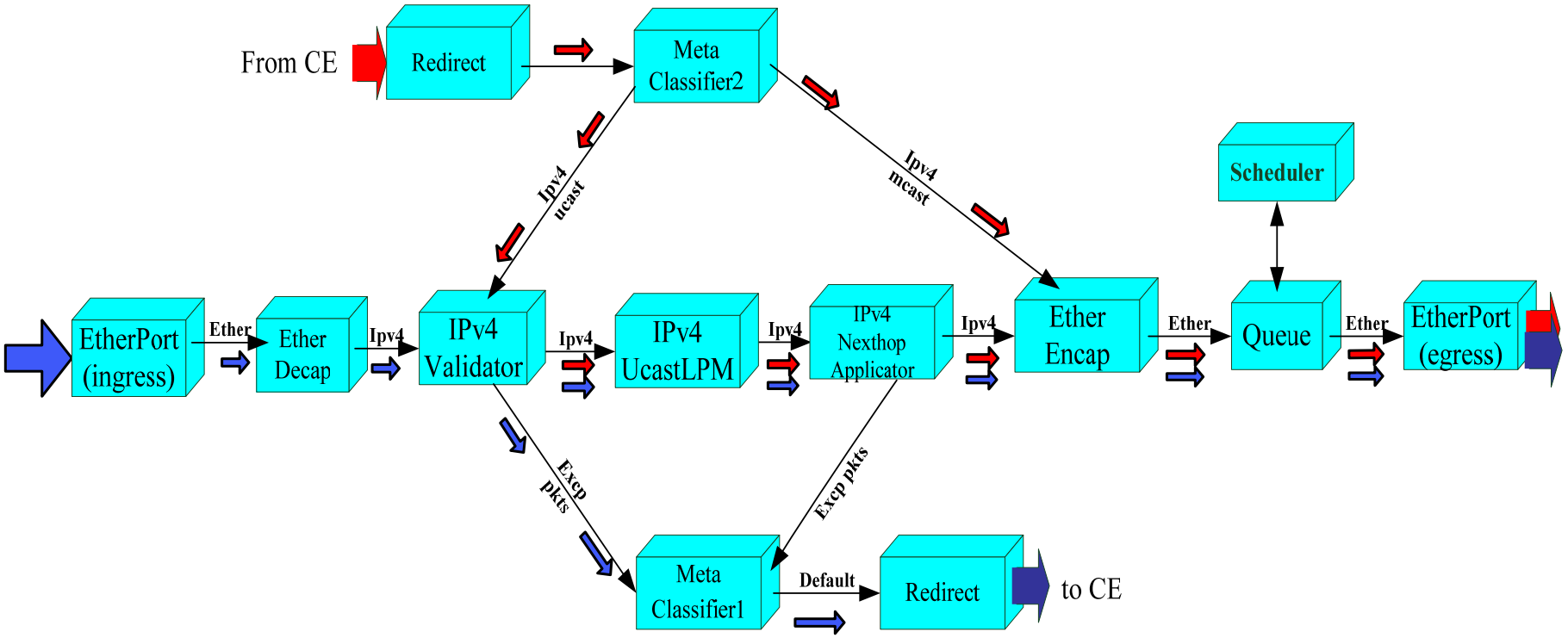
# LFB Design Logics - Miscellaneous LFBs (1)

- Classifier LFBs
  - ArbitraryClassifierLFB
    - A classifier which can test packet or metadata, and on that basis set meta-data a pick an output port.
    - Components
      - ClassifierTable
  - MetadataClassifier
    - Classify packets according to the meta data. Now only works on one meta data
    - Components
      - MetadataClassifyTable

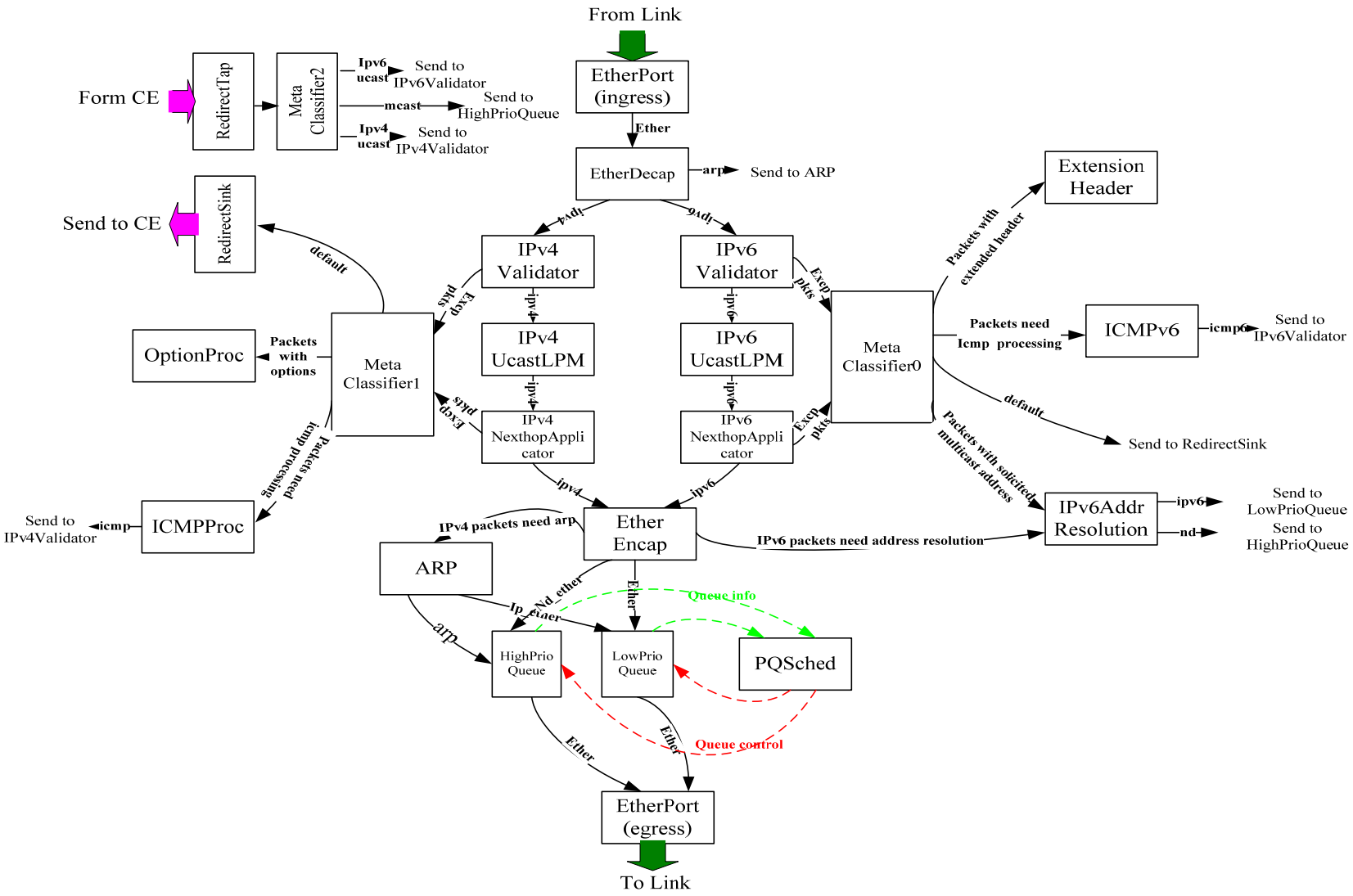
# LFB Design Logics - Miscellaneous LFBs (2)

- Packet processing LFBs
  - OptionProc
    - Processes on the IPv4 router-alert option
  - ExtendHeaderProc
    - Processes IPv6 packets with extended header
  - PacketTrimmer
    - Removes data from the front of a packet.
  - Duplicator
    - Duplicates packets
- For CE-FE connection
  - RedirectLFB
    - Represents a point of exchange of data packets between CE and FE. Packets with meta-data are exchanged.

# LFB use case - IPv4 Router



# LFB use case-IPv4 &IPv6 Router



# Thanks!