On Update of ForCES LFB Library Draft

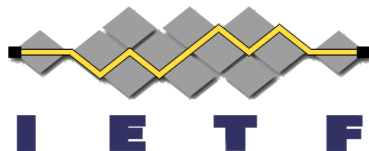## <draft-ietf-forces-lfb-lib-01 >

Authors

Weiming Wang , wmwang@zjgsu.edu.cn
Evangelos Haleplidis , ehalep@ece.upatras.gr
Kentaro Ogawa，ogawa.kentaro@lab.ntt.co.jp
Fenggen Jia，jfg@mail.ndsc.com.cn
Halpern Joel，joel.halpern@ericsson.com

Contributors

Jamal Hadi Salim, hadi@mojatatu.com
Ligang Dong, donglg@zjgsu.edu.cn

IETF 78th Meeting
July 25-30, 2010 , Maastricht, Netherlands

I E T F

Draft Status

- Version 01: March 2010

- Update Version to be made soon
  - based on discussions and consensuses since last version
  - include the following modifications
    - modifications on definitions of LFB classes
      - especially on the Port related LFBs

    - to rich the overview section to reflect the ideas on the modifications of LFB classes and their functions
      - e.g., add descriptions on support of VLANs, why, which way, to which extend ...
    - compose xml files for various LFBs
    - recompose possible use cases

Consensuses since Version 01 (1)

- Remove all related to FEPO and FEO
- Remove all related to ICMP processing
- IPv4 and IPv6 are separate at the level of LFBs
    - e.g., IPv4Validator, IPv6Validator
        ARP LFB, IPv6ND LFB
- On LFB Classes
    - to define a sample scheduler LFB with multiple inputs and one output, and with queues inside
        - an xml definition is given for comment
    - Redirect LFBs: RedirectSink LFB and RedirectTap LFB
- Much work done and great progress made on the definitions of Ethernet connection related LFBs
    - As Joel presented

Consensuses since Version 01 (3)

- Use ArpTable in ARP LIB and NbrTable in IPv6ND LFB as alias in EtherEncap

- NH is reasonable to have as a separate table. So you have LPM --> NH. However, the fact that there is another "model" which has a FIB conjoined with NH needs to be mentioned in the draft. In such a model - the FE will not have a separate NH table/LFB. We need to mention that in such a case, the FE needs to do book-keeping to keep track of what it means to have example path nh.1.2 and translate that to the conjoined FIB/NH.

For Discussion: LFB Classes

- Ethernet connectivity LFBs
  - EtherPHY LFB, EtherInPort LFB, EtherClassifier LFB, EtherEncap LFB, EtherOutLFB

- IPv4 Processing LFBs
  - IPv4Validator LFB, IPv4UcastLPM LFB, IPv4NHApplicator LFB

- IPv6 Processing LFBs
  - IPv6Validator LFB, IPv6UcastLPM LFB, IPv6NHApplicator LFB

- Address Resolution LFBs
  - ARP LFB, IPv6ND LFB

- QoS LFBs
  - Generic Scheduler LFB

- Redirect LFBs
  - RedirectTap LFB and RedirectSink LFB

For Discussion: EtherPHY LFB (1)

- Inputs
  - one single input receiving Ethernet packets from EtherOutPort LFB
- Outputs
  - one single output sending Ethernet packets to EtherInPort LFB
- Events
  - ?
- Capbilities
  - ?

For Discussion: EtherPHY LFB (2)

Component Name	type	property	Default value
IfIndex	uint32	read-write	Alias (EtherInPort)
IfName	String[16]	read-write	Alias (EtherInPort)
LinkSpeed	Atomic: LANSpeedType	read-write	Alias (EtherInPort)
DuplexMode	Atomic: NegotiationType	read-write	Alias (EtherInPort)
Media	uchar	read-only	"Copper100Base-TX"
StatsEnable (statistics enable)	booleanType	read-write	"no"
PortStats (port statistics)	Struct: PortStatsType	read-reset	

- do we need other components alias from EtherInPort ?
  - like the port status?

For Discussion: EtherInPort LFB (1)

- Inputs
  - one single input receiving Ethernet packets from one EtherPHY LFB

- Outputs
  - L3forwardingOut: single output sending Ethernet packets to EtherClassifier LFB for L3 processing
  - L2forwardingOut: single output sending packets to LFBs on bridging functions for L2 only processing

- Events
  - PortStatusChanged

- Capbilities
  - none ?

- Components
  - see next page

For Discussion: EtherInPort LFB (2)

Component Name	Type	property	Default value
IfIndex	uint32	read-only or r/w?	
IfName	String[16]	read-write	
LinkSpeed	Atomic: LANSpeedType	read-write	
MTU	uint32	read-write	
OperaStatus	Atomic: PortStatusValues	read-only	"down"
AdminStatus	Atomic: PortStatusValues	read-write	"down"
PromiscuousMode	booleanType	read-write	"no"
CarrierStatus (need it?)	booleanType	read-only	"no"
DuplexMode	Atomic: NegotiationType	read-write	"auto"
SrcMACAddr	IEEEMAC	read-write	
MacAliasTable	Array: IEEEMAC	read-write	
L2ForwardingEnable	booleanType	read-only	"no"
StatsEnable (statistics enable)	booleanType	read-write	"no"
PortStats (port statistics)	Struct: PortStatsType	read-reset	

For Discussion: EtherOutPort LFB (1)

- Inputs
  - one single input receiving Ethernet packets from EtherEncap LFB and/or other bridging LFBs

- Outputs
  - one single output sending Ethernet packets to one EtherPHY LFB

- Events
  - none? or Portstatschanged?

- Capbilities
  - none ?

For Discussion: EtherOutPort LFB (2)

Component Name	type	property	Default value
IfIndex	uint32	read-write	Alias (EtherInPort)
IfName	String[16]	read-write	Alias (EtherInPort)
MTU	uint32	read-write	Alias (EtherInPort)
StatsEnable (statistics enable)	booleanType	read-write	"no"
PortStats (port statistics)	Struct: PortStatsType	read-reset	

- do we need other components with alias from EtherInPort ?
  - like MAC address, port status?

For Discussion: EtherClassifier LFB (1)

- Inputs
  - one single inputs receiving Ethernet packets from EtherInPort

- Outputs
  - multiple singleton outputs (or one group output?) sending various types of over Ethernet layer packets

- Events
  - none ?

- Capbilities
  - none ?

For Discussion: EtherClassifier LFB (2)

- Components

Component Name	type	property	Default value
DispatchTable	Array: DispatchTableType	read-write	
VLanTable	Array: VLanTableType	read-write	

DispatchTableType{
   PacketType:
        1 - Other
        2 – IPv4
        3 – IPv6
        4 – ARP
        5 – ND
        6 – MPLSUnicast
        7 – MPLSMulticast
        8 – PPPDiscovery
        9 - PPPSession
   index }

VLanTableType: To be done

For Discussions: EtherEncap LFB (1)

- Inputs
  - one single input receiving packets from multiple upstream LFBs

- Outputs
  - SuccessOut?: single output
  - ExceptionOut? single output

- Events
  - none ?

- Capbilities
  - none ?

For Discussion: EtherEncap LFB (2)

- Components

Component Name	type	property	Default value
ArpTable	Array: ArpTableEntryType	read-write	
DCHostTablev4	Array: DCHostTableEntryTypev4	read-write	
VLanTable			
NbrTable			
DCHostTablev6			

For Discussion: IPv4Validator LFB (1)

- Inputs
  - one single input receiving IPv4 packets from multiple upstream EtherClassifier or other LFBs

- Outputs
  - IPv4UnicastOut，one single output
  - IPv4MulticastOut，one single output
  - FailOutput， one single output

- Events
  - none?

- Capbilities
  - none?

For Discussion: IPv4Validator LFB (2)

- Components

Component Name	type	property	Default value
LocalIPv4addressTable	Array: Portv4AddressType		
StatsEnable	booleanType	read-write	"no"
IPv4ValidatorStats	Struct: IPv4ValidatorStatisticsType	read-set	

For Discussion: IPv4Validator LFB (3)

- portv4AddressType {

    IfIndex //how to be represented so as to be alias of IfIndex in EtherInPort, and may should be read only?//

    IPv4Address

    IPv4NetMask

    }

- IPv4ValidatorStatisticsType

    {

    badHeaderPkts

    badTotalLengthPkts

    badTTLPkts

    badChecksum

    }

For Discussion: IPv4UcastLPM LFB

- TBD

For Discussion: ARP LFB (1)

- Inputs
  - ArpPktIn，ARP protocol packet in from EtherClassifier LFB
- Outputs
  - ArpPktOut，ARP protocol packet out to EtherEncap LFB
- Events
  - none?
- Capbilities
  - none?

For Discussion: ARP LFB (2)

- Components

Component Name	type	property	Default value
LocalIPv4addressTable			Alias (IPv4Validor LFB)
Arptable			Alias (EtherEncap LFB)

- many problems regarding how the alias components are represented?
  - especially the local IP address component

Comments on LFB class definitions work

- might be the key work in next step

- quite complex work to do
  - need more people to join the discussions so as to speed up
    - Shall we extend the discussions from among authors to the whole ForCES list ?

- should accomplish the work ASAP!

Acknowledgments

Thanks to Chuanhuang Li,Rong Jin and David Allan for their valuable contributions to the progress of the work.

Thanks!