

Forces vs. ONF [July 2012]

Upcoming draft:

Draft-hares-forces-vs-openflow-
00.txt

Question

- “ Requesting Input prior to draft
- “ How does ONF Relate to ForCES?
- “ How does this help us get to devices that operate in the Cloud or strong cloud services or Software (D*) Networks
 - . D* = Defined, driven

Quotes:

- “ “OpenFlow-0 is the Diff-Serv Tspec, OpenFlow-1.0 is Forces-, and OpenFlow 1.1 is Forces++”

- “ “We realize with OF releases [OFS1.2, OFS-1.3, OFS-1.4], the implementation experience was lacking. Most implementations are on OFS 1.0. OFS releases are slowing down to let implementations out”

- “ ONF has repackaged some of the ForCES existing technology in an industry
 - . Some of ForCES missing,
 - . Implementations experience is only on 1.0
 - . Is Google deployment in G-network – a pattern for all networks?

Topics covered in the

- “ Goals - historically and now
- “ Architectural models
- “ Flow Logic
- “ Forwarding Models and Building Block Libraries
- “ Protocol
- “ Applications using (Firewalls, Load-balancer, High availability nodes).

Historical context

Forces History

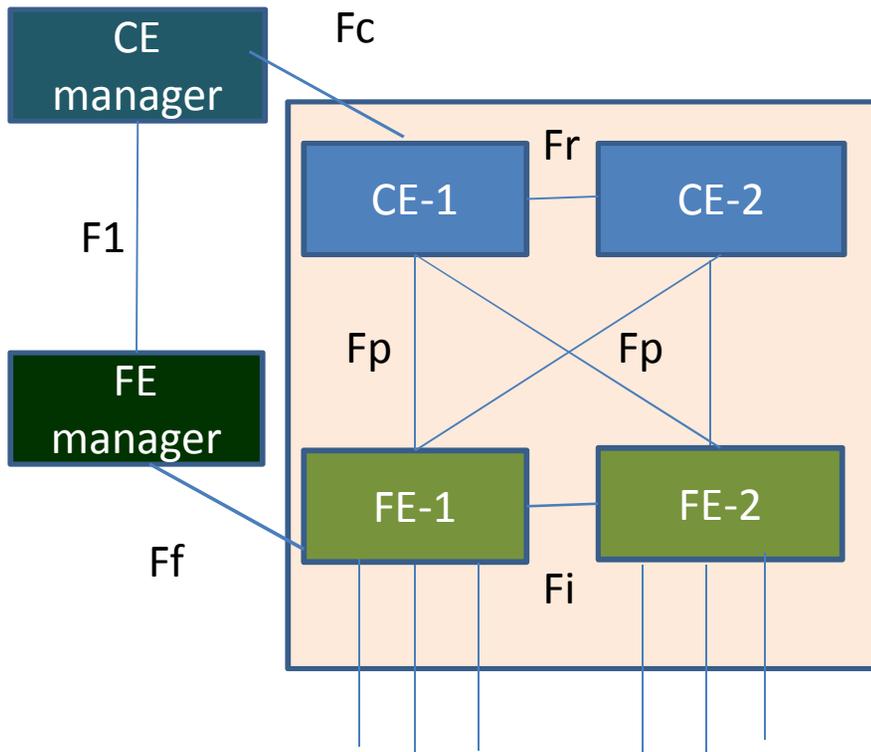
- “ Designers of Network Processors (NP) wanting commodity chips for Advanced functions
- “ NP Forum Common API to control NP
- “ Movement to IETF for open standards

ONF history

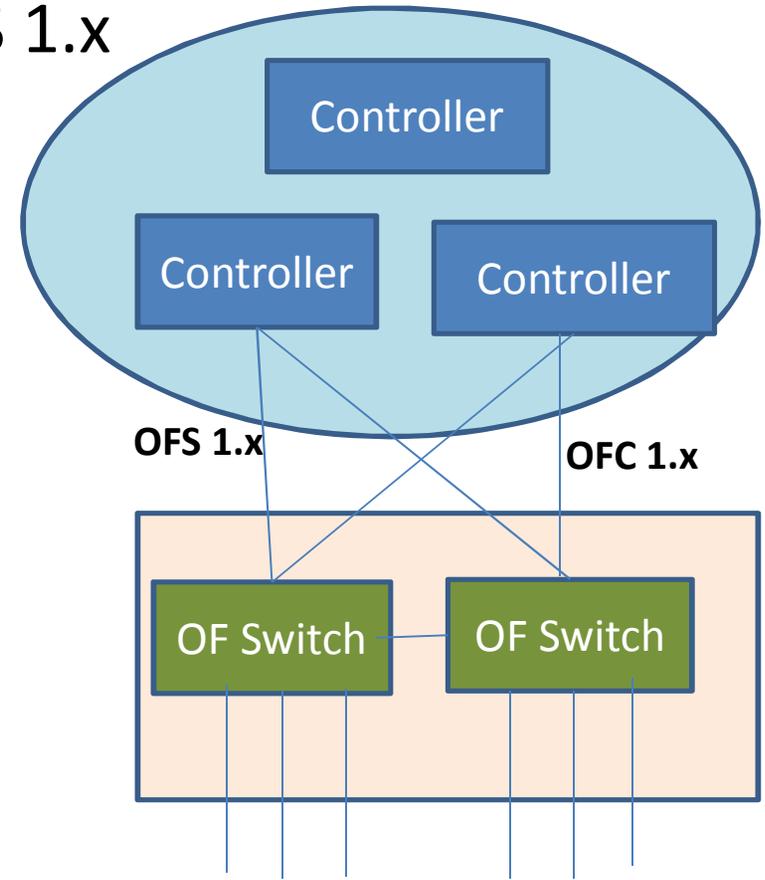
- “ Researchers looking for large scale networks to test NG (GENI)
- “ ONF – Industry Forum with open work & Industry board voting on final Standards

Architectural Models

Forces



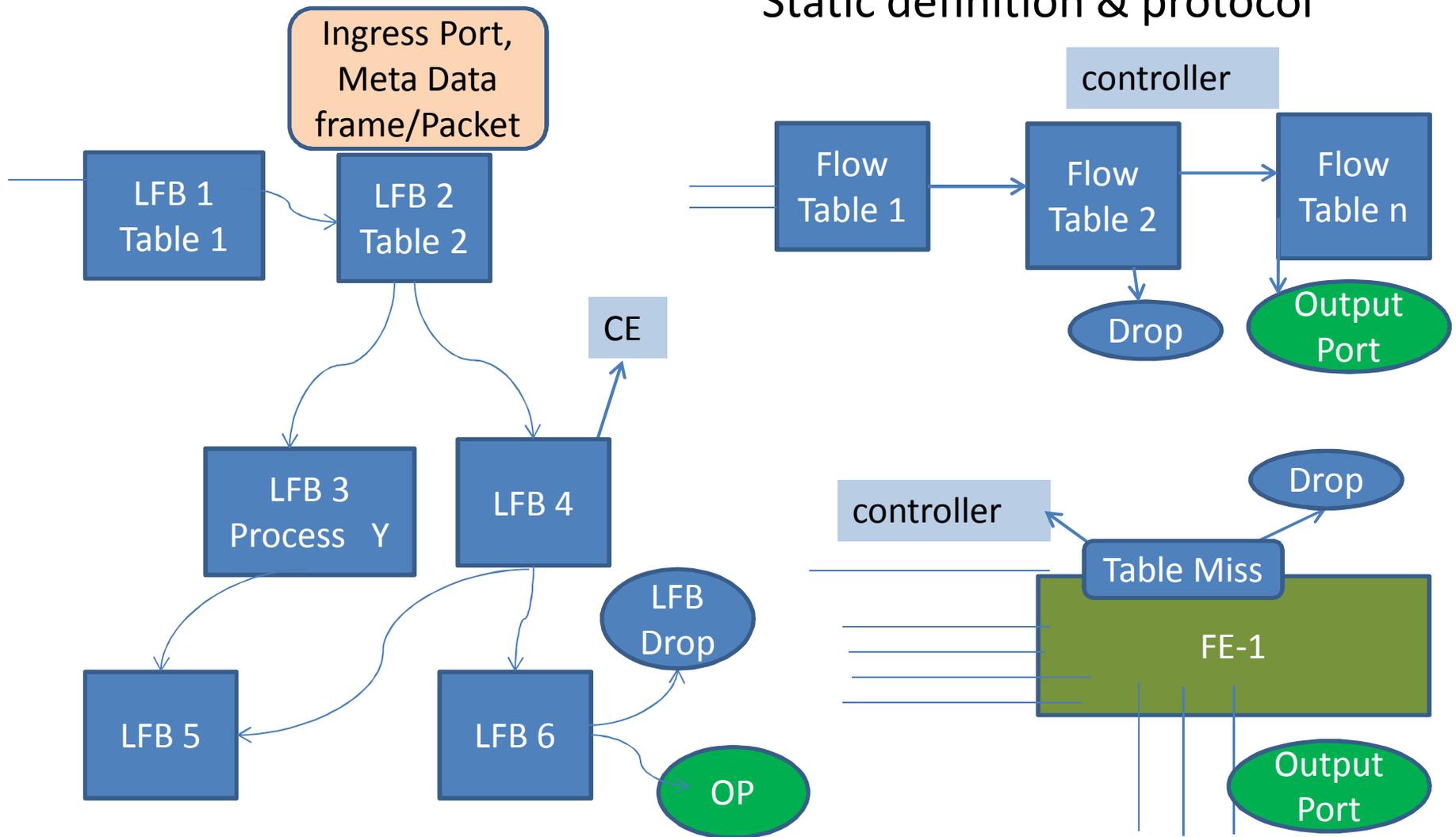
OFS 1.x



OFS does not define initialization of system

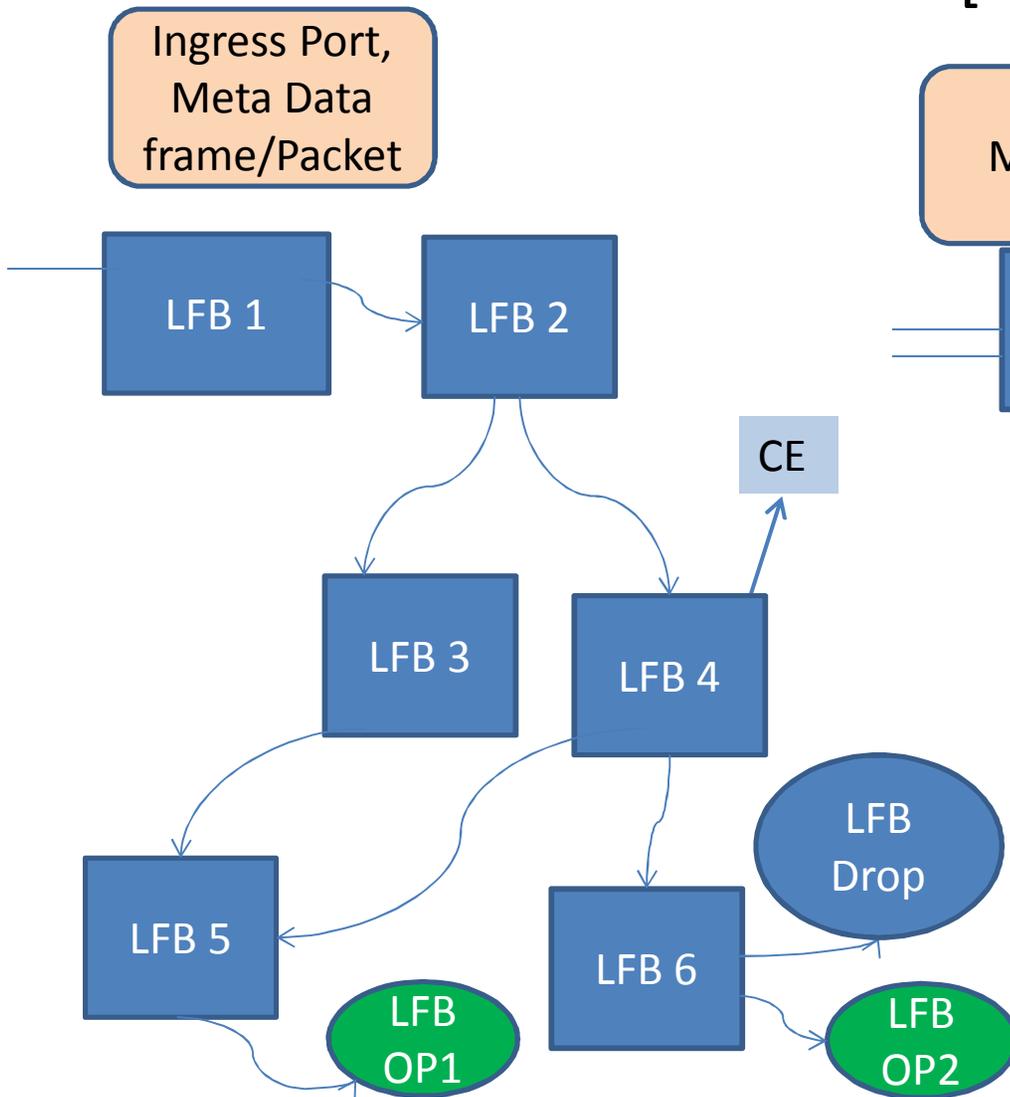
Flow Logic

“ Forces – Dynamic definition ” [McKeown2008][OFS1.0] – Static definition & protocol

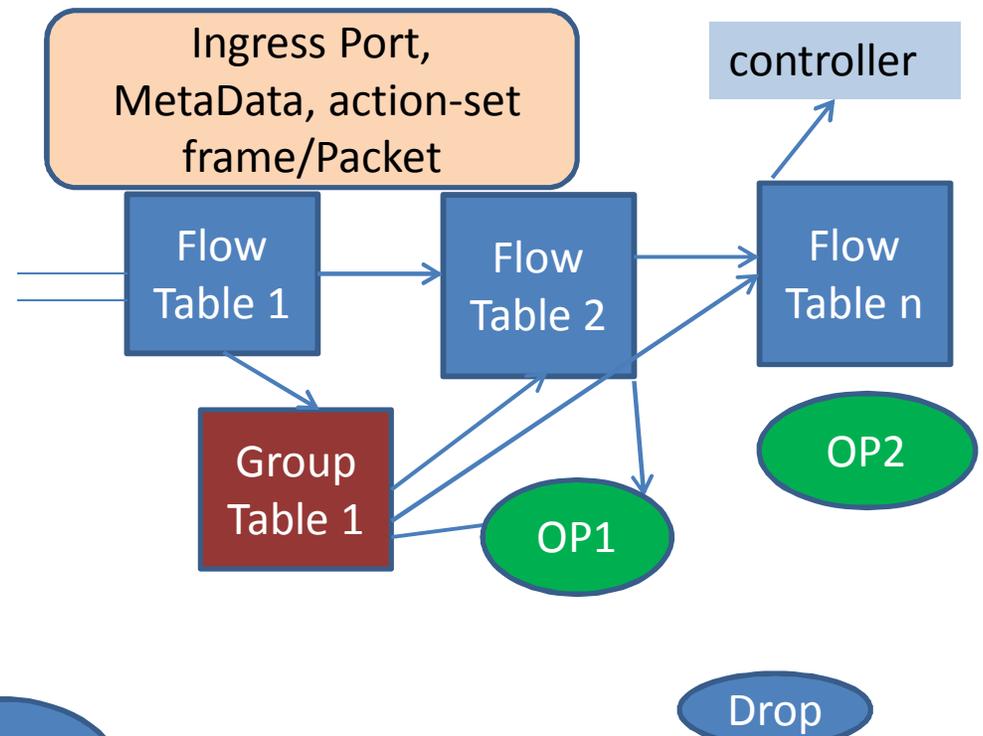


Flow Logic

“ Forces



“ [OFS 1.1]/ [OFS 1.2][



**Is the Group Table ==
ForCES with LFB logic?**

FP Modeling and Libraries

- “ Forces FP Modeling
 - . Modeling language to allow flexible definitions and extensions of LFBs
 - . LFB library with models
 - . Sample libraries
 - “ Ethernet LFBs
 - “ IP Validator LFBs
 - “ iP Forwarding (v4/v6 unicast/multicast)
 - “ Redirect
 - “ Schedule, Meta Dispatch
- “ [McKeown-2008][OFS-1.0] [OFS-1.1][OFS-1.2][OFS-1.3][OFS-1.4]
 - . Defined LFB
- “ Hybrid –
 - . S.I.N (ships in night) or Integrated doesn't change basics
- “ [OFS-Futures]
 - . Realized that OFS-1.1 was too static
 - . LFB modeling on “todo list” , not planned

CE/FE Protocol

- “ Forces
- “ Runs over Secure Transport (TML with STCP)
 - . Security optional with IP-Sec
 - . Separated configuration, events, packet exceptions
- “ Controls
 - . Configuration
 - . LFB control download
 - . Error control
 - . Events
- “ Handles Error control
- “ Pre-association concepts

OFS

- “ Runs over Secure Transport (SSL)
- “ Controls
 - . Configuration
 - . Flow Table download
 - . Error/ statistics
 - . no Synchronous events
- “ Handles error control
- “ No pre-association concepts in protocol

Draft Compares

- “ Historical input
- “ Goals
- “ Architectural requirements
 - . Pre-association (controller meeting & connecting to forwarders)
 - . Impact on centralized
- “ Forwarding Models
 - . [OFS 1.1] [OFS-1.2]
- “ Protocol
 - . Secure transport
 - . Interface
- “ Use of Forces in S*D*N
 - . Netlink/ForCES
 - . Hybrid, distributed, control
 - . As good or better than OFS

My Conclusions

- “ Both ForCES and OFS follow the basic idea of separations of forwarding plane and control plane in network elements.
 - . Both are capable of operating for centralized control, distributed control, and hybrid control.
- “ [OFS-1.1] Flow Table Logic with the instructions and Group Tables is the major difference between the ForCES RFCs.
 - . Is this difference a benefit, problem or “it depends”
 - . Implementation is needed for comparison (Academic and Commercial)



My Conclusion

- “ [OFS-1.0][OFS-1.1][OFS-1.2][OFS-1.3]
 - . lacks a forwarding model, a standardized LFB library and the concepts of FE-CE associations (FE-Manger, CE-Manager, pre/post association phase).
 - . It appears the OpenFlow work is starting to invent the equivalent of existing ForCES work as OpenFlow work.
 - . The guide of this reinventing seems to be the Google code snippets passed to the OpenFlow Forum as examples of “running code” to provide rough consensus.

Next Steps in Net-Life



- “ Let’s try out implementations
- “ SDN over _____
 - . Will have multiple CE/Controller and Forwarding planes
 - . Do comparison between ONF & ForCES yourself in code
 - . Try it in multiple scenarios: Switch, MBH, firewall, AS
- “ Share your experiences

WG Next Steps

- “ Ask adoption as WG draft
- “ Other drafts on Forces vs. ONF with experiences with SDN



Q & A

