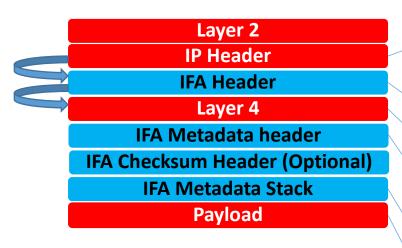
draft-kumar-ippm-ifa-01

IETF-105

Agenda

- Recap
- Deployment
 - Usecases
 - Challenges
- Next Steps

IFA – L3 Protocol Extension Header



- Use 1 experimental IP protocol type (143 – 252): PROTO IFA
- Original IP->proto is copied in IFA->proto
- IFA header is treated as L3 extension header
- Metadata is treated as L4 information
- Metadata is treated as foreign object
 - L4 length and checksum is not updated
 - This is to ease load on hw to strip and forward

	0		1			2				3	
	0 1 2 3		8 9 0 1	2 3 4 5	6 7 8	9 0 1	2 3	4 5 6	7 8 9	0	1
	IPv4 Head										
	+-+-+-+- Version +-+-+-+	IHL	Type of	Service		T	otal'	Length	l		
	1	Identi	fication		Flags		Fra	gment C	ffset		
	Time t										
	+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-										
	Destination IPv4 Address										
	IFA Header: +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-										
	Ver=2.0	GNS	Proto	col		Flags		Max	Lengtl	h	
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-											
		Dest Port = VXLAN Port									
		UDP Checksum									
	+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-										
	TLY IND He	ader:				1 1					
	+-+-+-+-	-+-+-+-			+-+-+-+	-+-+-	+-+		-+-+-		
	+-+-+-+- Request	-+-+-+- Vector	Action	Vector	+-+-+-+ Hop	+-+- Limit	+-+	Curr	-+-+- Leng	th.	
	+-+-+-+- Request +-+-+-+-	-+-+-+ Vector -+-+-+	Action	Vector +-+-+-	+-+-+- Hop +-+-+-	-+-+- Limit +-+	+-+ • +-+	Curr	-+-+- Leng	th. +-+	 -+
	+-+-+-+- Request +-+-+-+- IFA Metada 	Vector	Action +-+-+ ck: +-+-+-	Vector +-+-+ +-+-+ Metadata	+-+-+- Hop +-+-+-+ +-+-+-	+-+- Limit +-+-	+-+ +-+	Curr	-+-+	th. +-+ +-+	-+ -+
	+-+-+-+- Request +-+-+-+- IFA Metada 	-+-+ Vector -+-+ ata Stac -+-+	Action 	Vector +-+-+ +-+-+ Metadata +-+-+-	+-+-+-+ Hop +-+-+-+ +-+-+-+ a Stack +-+-+-+	+-+- Limit +-+-	+-+ • +-+ +-+	Curr	-+-+ Leng	th. +-+ +-+	-+ -+ -+
	+-+-+-+- Request +-+-+-+- IFA Metada 	Vector -+-+ ata Stac -+-+	Action 	Vector +-+-+ Hetadata +-+-+ IP Paylo	+-+-+-+ Hop +-+-+-+ +-+-+-+ a Stack +-+-+-+ +-+-+-+	-+-+- Limit +-+- +-+-	+-+ +-+ +-+	Curr +-+-+-+ +-+-+-+ +-+-+-+	-+-+ Leng	th. +-+ +-+ +-+	-+ -+ -+ -+ 3

Deployment - Usecases

- ✓ Deployed in 3 MSDCS and 2nd largest cloud services provider
- ✓ Deployment and technology paper published in IEEE
- ✓ Traffic Profile
 - TCP/UDP/VxLAN'/GREinGRE Flows
 - Live Flows (1in1 or 1inN sample)
 - Cloned Flow Packets (1inN samples are cloned)
 - Probe Packets (Synthetic packets)
- ✓ Feature Profile
 - Layer 4 ACL
 - Policy Based Routing
 - NAT (SNAT/DNAT/Hairpinning)
- ✓ Hierarchical Analysis of Metadata (to reduce load on collector)
 - Threshold based report for queue depths, per hop latency
 - Route change detection via nexthop/egress RIF monitoring
 - Per flow drop detection
 - Per flow congestion avoidance using path latency data (paper publish in sigcomm 2019)

Deployment - Challenges

- ✓ Very large hops in a path
 - Introduced a concept of metadata fragmentation
- ✓ Legacy device not able to understand IFA protocol CP in IP header
 - Flow path changes (use User Defined Fields to be picked for hash computation)
 - Unknown IP protocol (Install an override rule to accept unknown IP proto)
 - Some devices just can not be supported

Next Steps

- ✓ IFA deployment for IPv6 domain
- ✓ IFA deployment for AH/ESP tunnels
- ✓ Work with IOAM authors to align the IFA learnings

Thank You