Introduction

• “SRv6 network programming” refers to the capability for an application to encode any network program as a set of individual functions distributed through the SRv6 network

• This main document describes the SRv6 network programming concepts, its various functions, and its main use-cases
SRv6 behaviors

End
Endpoint function
The SRv6 instantiation of a prefix SID

End.X
Endpoint function with Layer-3 cross-connect
The SRv6 instantiation of a Adj SID

End.T
Endpoint function with specific IPv6 table lookup

End.DX2
Endpoint with decapsulation and Layer-2 cross-connect
L2VPN use-case

End.DX2V
Endpoint with decapsulation and VLAN L2 table lookup
EVPN Flexible cross-connect use-cases

End.DT2U
Endpoint with decaps and unicast MAC L2 table lookup
EVPN Bridging unicast use-cases

End.DT2M
Endpoint with decapsulation and L2 table flooding
EVPN Bridging BUM use-cases with ESI filtering

End.DX6
Endpoint with decapsulation and IPv6 cross-connect
IPv6 L3VPN use (equivalent of a per-CE VPN label)

End.DX4
Endpoint with decapsulation and IPv4 cross-connect
IPv4 L3VPN use (equivalent of a per-CE VPN label)

End.DT6
Endpoint with decapsulation and IPv6 table lookup
IPv6 L3VPN use (equivalent of a per-VRF VPN label)

End.DT4
Endpoint with decapsulation and IPv4 table lookup
IPv4 L3VPN use (equivalent of a per-VRF VPN label)

End.DT46
Endpoint with decapsulation and IP table lookup
IP L3VPN use (equivalent of a per-VRF VPN label)

End.B6
Endpoint bound to an SRv6 policy
SRv6 instantiation of a Binding SID

End.B6.Encaps
Endpoint bound to an SRv6 encapsulation Policy
SRv6 instantiation of a Binding SID

End.BM
Endpoint bound to an SR-MPLS Policy
SRv6/SR-MPLS instantiation of a Binding SID

End.S
Endpoint in search of a target in table T

T
Transit behavior
T.Insert
Transit behavior with insertion of an SRv6 policy
T.Insert.Red
Transit behavior with reduced insert of an SRv6 policy
T.Encaps
Transit behavior with encapsulation in an SRv6 policy
T.Encaps.Red
Transit behavior with reduced encaps in an SRv6 policy
T.Encaps.L2
T.Encaps behavior of the received L2 frame
T.Encaps.L2.Red
Transit with reduce encaps of received L2 frame

+ Intra-domain basic security ACLs
+ Counters
Use Cases (I-D illustrations)

• Basic Security
• SR-L3VPN
• SR-L2VPN-VPWS
• SRTE for Underlay SLAs
  • Policy @ ingress PE
  • Policy @ mid
• End-to-end SRTE policy
• TI-LFA
• SRTE for Service Programming
I-D history

• Rev00 published in March 2017
  • Main draft. Including functions, illustrations, ... -> Presented in IETF98 (Chicago, March 2017)

• Rev01 published in June 2017
  • Minor update. Draft clarifications. Formal definition of counters

• Rev02 published in October 2017
  • New EVPN functions End.DX2V, End.DT2U, End.DT2M and related illustrations
  • New function End.DT46
  • Moved End.AS, End.AM to draft-xuclad-spring-sr-service-chaining-01

• Rev03 published in December 2017
  • Added OAM (O-bit processing, End.OTP function) with related illustrations

• Rev04 published in March 2018
  • IANA registry for SRv6 Endpoint types

• Rev05 published in July 2018
  • Added End.B6.Red (editorial error from previous revision)
  • OAM content (O-bit processing and End.OTP) moved to draft-ali-spring-srv6-oam
Technology state

• Large community support (both from vendors and operators)
• Multiple interoperable implementations (both open-source and proprietary)
  • SIGCOMM 2017 Interop
  • EANTC Interop 2018
  • draft-filsfils-spring-srv6-interop
    • Linux srext module: End, End.X, End.DX2, End.DX6, End.DX4, End.AD, End.AM
Related work based on this I-D

- draft-dukes-spring-sr-for-sdwan-01
- draft-ietf-dmm-srv6-mobile-uplane-02*
- draft-xuclad-spring-sr-service-programming*
- draft-dawra-idr-srv6-vpn-04
- draft-ali-spring-srv6-oam-01*
- draft-raza-spring-srv6-yang-01
- draft-rodrigueznatal-lisp-srv6-00
- draft-dawra-idr-bgpls-srv6-ext-03
- draft-bashandy-isis-srv6-extensions-03
- draft-li-ospf-ospfv3-srv6-extensions-03
Next steps

• Seeking WG input and feedback (any comment is welcomed!)