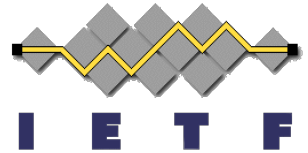


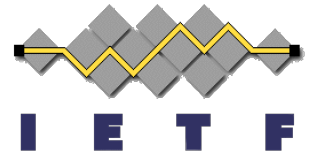
# LSR WG Overview

## Routing Open Meeting

### IETF 116, Tokyo

Acee Lindem, LabN  
Chris Hopps, LabN



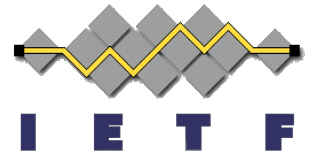


# LSR Working Group Charter

The Link-State Routing (LSR) Working Group is chartered to document current protocol implementation practices and improvements, protocol usage scenarios, maintenance and extensions of the link-state interior gateway routing protocols (IGPs) - specifically IS-IS, OSPFv2, and OSPFv3. The LSR Working Group was formed by merging the isis and ospf WGs and assigning all their existing adopted work at the time of chartering to LSR.

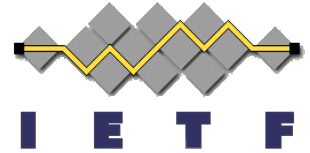
- IS-IS is an IGP specified and standardized by ISO through ISO 10589:2002
- RFC 2328 – OSPF Version 2
- RFC 7684 – OSPFv2 Prefix/Link Attribute Advertisement
- RFC 5340 – OSPFv3 for IPv6
- RFC 8362 - OSPFv3 Link State Advertisement (LSA) Extensibility

# Current Focus



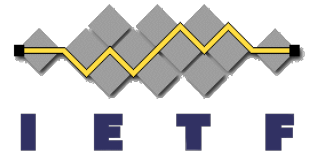
- Base Protocol Extensions – Changes and additions to base IGP protocol mechanisms to improve protocol scalability and operation.
- Protocol Maintenance – Extensions to the IGPs to advertise additional prefix/link attributes and other information in support of new use cases.
- Segment Routing – Extensions to the IGPs to advertise segment routing information (e.g., Prefix and Adjacency SIDs) for both MPLS and SRv6.
- Flex Algorithm – Extensions to the IGP to support route computation using multiple algorithms and constraints for both segment routed and IP networks.
- YANG Models – IGP YANG models covering all the base protocol and all extensions.

# Cross-WG Interactions



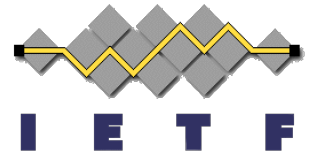
- IDR – Collaboration on BGP-LS extensions.
- BIER – Review of IGP BIER Extensions (processed in BIER via agreement)
- SPRING – IGP Advertisement of Segment Routing information
- RTG – Review of IGP advertisement of protection mechanisms
- PCE/BFD/MPLS – IGP Advertisement of protocol discovery information
- CCAMP – Past review TE information advertised in OSPF although this has not been the case for some time.

# Base Protocol Extensions



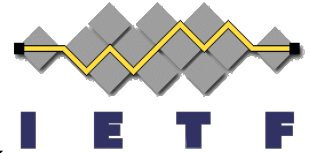
- RFC 8918 – IS-IS Invalid TLV Handling
- RFC 8919 – IS-IS Application-Specific Attributes
- RFC 8920 – OSPF Application-Specific Attributes
- IS-IS Flood Reflection - draft-ietf-lsr-isis-flood-reflection
- IS-IS Fast Flooding - draft-ietf-lsr-isis-fast-flooding
- Dynamic Flooding on Dense Graphs - draft-ietf-lsr-dynamic-flooding
- Flooding Topology Minimum Degree Algorithm - draft-ietf-lsr-flooding-topo-min-degree
- Area Proxy for IS-IS - draft-ietf-lsr-isis-area-proxy
- OSPF Transport Instance - draft-ietf-lsr-ospf-transport-instance
- IS-IS Optimal Distributed Flooding for Dense Topologies - draft-ietf-lsr-distoptflood
- IS-IS Topology-Transparent Zone - draft-ietf-lsr-isis-ttz
- RFC 8919 and RFC 8920 BIS versions with clarifications

# Protocol Maintenance (1/2)



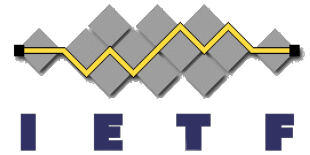
- RFC 8706 – IS-IS Restart Signaling
- RFC 8770 – OSPF Host Routing Support
- RFC 9013 - OSPF Advertisement of Tunnel Encapsulations
- RFC 9088 - Signaling Entropy Label Capability and Entropy Readable Label Depth Using IS-IS
- RFC 9089 - Signaling Entropy Label Capability and Entropy Readable Label Depth Using OSPF
- RFC 9084 – OSPF Prefix Originator Extensions
- RFC 9339 – OSPF Reverse Metric
- RFC 9346 – IS-IS Extensions in Support of Inter-Autonomous System (AS) MPLS and GMPLS Traffic Engineering

# Protocol Maintenance (2/2)



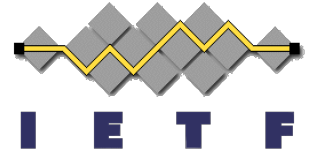
- RFC 9356 – Advertising Layer 2 Bundle Member Link Attributes in OSPF
- RFC 9353 - IGP Extension for Path Computation Element Communication Protocol (PCEP) Security Capability Support in PCE Discovery (PCED)
- RFC 9355 - OSPF Bidirectional Forwarding Detection (BFD) Strict-Mode
- RFC 9356 - Advertising Layer 2 Bundle Member Link Attributes in OSPF
- Update to OSPF Terminology - draft-ietf-lsr-ospf-terminology
- Extensions to OSPF for Advertising Prefix Administrative Tags - draft-ietf-lsr-ospf-admin-tags

# Segment Routing



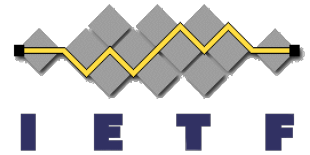
- RFC 8665 - OSPF Extensions for Segment Routing
- RFC 8666 - OSPFv3 Extensions for Segment Routing
- RFC 8667 - IS-IS Extensions for Segment Routing
- RFC 9352 - IS-IS Extensions to Support Segment Routing over the IPv6 Data Plane
- OSPFv3 Extensions for SRv6 - draft-ietf-lsr-ospfv3-srv6-extensions
- Using IS-IS Multi-Topology (MT) for Segment Routing based Virtual Transport Network - draft-ietf-lsr-isis-sr-vtn-mt

# Flex Algorithm



- RFC 9350 – IGP Flexible Algorithm
- IGP Flexible Algorithms – draft-ietf-lsr-ip-flexalgo
- Flexible Algorithms: Bandwidth, Delay, Metrics and Constraints  
- draft-ietf-lsr-flex-algo-bw-con
- Algorithm Related IGP-Adjacency SID Advertisement - draft-ietf-lsr-algorithm-related-adjacency-sid

# YANG Models



- RFC 9129 – OSPF YANG Model
- RFC 9130 – IS-IS YANG Model
- RFC 9192 - A YANG Module for IS-IS Reverse Metric
- YANG Data Model for OSPF SR (Segment Routing) Protocol - draft-ietf-ospf-sr-yang
- YANG Data Model for IS-IS SR (Segment Routing) Protocol - draft-ietf-isis-sr-yang
- YANG Model for OSPFv3 Extended LSAs - draft-ietf-lsr-ospfv3-extended-lsa-yang
- OSPF YANG Model Augmentations for Additional Features - Version 1 - draft-ietf-lsr-ospf-yang-augmentation-v1
- IS-IS YANG Model Augmentations for Additional Features - Version 1 - draft-ietf-lsr-isis-yang-augmentation-v1
- YANG Data Model for IS-IS SRv6 - draft-ietf-lsr-isis-srv6-yang
- YANG Data Model for OSPF SRv6-draft-ietf-lsr-ospf-srv6-yang