Advertising a Router's Local Addresses in OSPF TE Extensions

draft-raggarwa-ospf-te-node-addr-00.txt

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# 2. Abstract

This document describes procedures that enhance OSPF Traffic Engineering (TE) extensions for advertising a router's local addresses. This is needed to enable other routers in a network to compute traffic engineered MPLS LSPs to a given router's local addresses. Currently, the only addresses belonging to a router that are advertised in TE LSAs are the router's local addresses on links enabled for TE, and the Router ID.

#### 3. Motivation

In some cases it is desirable to setup, constrained shortest path first (CSPF) computed MPLS TE LSPs, to local addresses of a router that are not currently advertised in the TE LSAs i.e. loopback and non-TE interface addresses.

For instance in a network carrying VPN and non-VPN traffic, its often desirable to use different MPLS TE LSPs for the VPN traffic and the non-VPN traffic. In this case one loopback address may be used as the BGP next-hop for VPN traffic while another may be used as the BGP next-hop for non-VPN traffic. Its also possible that different BGP sessions are used for VPN and non-VPN services. Hence two separate MPLS TE LSPs are desirable, one to each loopback address.

However currently routers in an OSPF network can only use CSPF to compute MPLS TE LSPs to the router ID or the local addresses of TE enabled links, of a remote router. This restriction arises because OSPF TE extensions [OSPF-TE, OSPFV3-TE] only advertise the router ID and the local addresses of TE enabled links, of a given router. Other routers in the network can populate their traffic engineering database (TED) with these local addresses belonging to the advertising router. However they cannot populate the TED with other local addresses of the advertising router i.e. loopback and non-TE interface addresses. OSPFv2 stub links in the router LSA [OSPFv2], provide stub reachability information to the router but are not sufficient to learn all the local addresses of a router. The same problem exists with intra-prefix LSAs in OSPFv3 [OSPFv3].

For the above reasons this document proposes an enhancement to OSPF TE extensions to advertise the local addresses of a node.

## 4. A Potential Solution

A potential solution would be to advertise a TE link TLV for each local address, possibly with a new link type. However, this is inefficient, as the only meaningful information is the address. Furthermore, this would require implementations to process these TE link TLVs differently from others; for example, the TE metric is normally considered a mandatory sub-TLV, but would have no meaning for a local address

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## 5. Proposed Solution

The proposed solution is to advertise the local addresses of a router in a new node attribute TLV, in the OSPF TE LSA. It is anticipated that a node attribute TLV will also prove more generally useful.

## 5.1. Node Attribute TLV

The node attribute TLV carries the attributes associated with a router. The TLV type is TBD and the length is variable. It contains one or more sub-TLVs. This document defines the following sub-TLVs:

- 1. Node IPv4 Local Address sub-TLV
- 2. Node IPv6 Local Address sub-TLV

The node IPv4 local address sub-TLV has a type of 1 and contains one or more local IPv4 addresses. It has the following format:

Θ		1		2		3
0 1	2 3 4 5 6 7 8 9	0 1 2 3 4	5678	9012	3 4 5 6 7	8901
+-+-+	-+	+ - + - + - + - +	+ - + - + - + - +	+ - + - + - + - +	-+-+-+-+	+ - + - + - +
	1			L	ength	
+ - + - +	-+	+ - + - + - + - +	+ - + - + - + - +	+ - + - + - + - +	-+-+-+-+	+-+-+
		IPv4	4 Address	5 1		
+-+-+	-+	+ - + - + - + - +	+ - + - + - + - +	+ - + - + - + - +	-+-+-+-+	+ - + - + - +
+ - + - +	-+	- + - + - + - + - +	+ - + - + - + - +	+ - + - + - + - +	-+-+-+-+	+-+-+
		IPv4	4 Address	s n		
+-+-+	-+	+-+-+-+	+-+-+-+-+	+-+-+-+	-+-+-+-+	+-+-+

The length is set to 4  $^{\ast}$  n where n is the number of local addresses included in the sub-TLV.

The node IPv6 local address sub-TLV has a type of 2 and contains one or more local IPv6 addresses. It has the following format:

0	1		2	3
012	3 4 5 6 7 8 9 0 1 2	2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7	8901
+ - + - +	+ - + - + - + - + - + - + - + - + - + -	-+	+ - + - + - + - + - + - + - + -	+-+-+-+
	2		Length	
+-+-+-	+ - + - + - + - + - + - + - + - + - + -	-+	+ - + - + - + - + - + - + - + -	+-+-+-+
		IPv6 Address 1		1
				1
				1
+-+-+	+ - + - + - + - + - + - + - + - + - + -	-+	+ - + - + - + - + - + - + - + -	+-+-+-+

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The length is set to 16  $^{\ast}$  n where n is the number of local addresses included in the sub-TLV.

#### <u>6</u>. Security Considerations

This document does not introduce any further security issues other than those discussed in [<u>OSPF-TE</u>, <u>OSPFv3-TE</u>].

#### 7. IANA Considerations

The Node Attribute TLV type has to be IANA assigned from the range 3 - 32767 as specified in [<u>OSPF-TE</u>].

#### 8. Acknowledgments

We would like to thank Nischal Sheth for his contribution to this work. We woud also like to thank Jean Philippe Vasseur for his comments.

## 9. References

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[OSPF-TE]	D. Katz, K. Kompella, D. Yeung, "Traffic Engineering Extensions to OSPF version 2", <u>RFC 3630</u> , September 2003.
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[0SPFv3-TE]	K. Ishiguro, T. Takada, "Traffic Engineering

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[OSPF-TE-MESH] J. P. Vasseur, P. Psenak, "OSPF Traffic Engineering Capability TLVs", <u>draft-vasseur-mpls-ospf-te-cap-00.txt</u>.

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