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Requirements for OSPF Topology-Transparent Zone
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Abstract

This document presents a list of requirements for OSPF topology-transparent zone in a domain. A topology-transparent zone comprises a group of routers and a number of links connecting these routers. Any router outside of the zone is not aware of the zone. The information about the links and routers inside the zone is not distributed to any router outside of the zone. Any link state change such as a link down inside the zone is not seen by any router outside of the zone.

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1. Introduction

The number of routers in a network becomes larger and larger as the Internet traffic keeps growing. Through splitting the network into multiple areas, we can extend the network further. However, there are a number of issues when a network is split further into more areas.

At first, dividing an AS or an area into multiple areas is a very challenging task since it is involved in significant network architecture changes.

Secondly, it is complex for a Multi-Protocol Label Switching (MPLS) Traffic Engineering (TE) Label Switching Path (LSP) crossing multiple areas to be setup. In one option, a TE path crossing multiple areas is computed by using collaborating Path Computation Elements (PCEs) [[RFC5441](#)] through the PCE Communication Protocol (PCEP) [[RFC5440](#)], which is not easy to configure by operators since the manual configuration of the sequence of domains is required. Although this issue can be addressed by using the Hierarchical PCE, this solution may further increase the complexity of network design. Especially, the current PCE standard method may not guarantee that the path found is optimal.

Furthermore, some policies need to be configured on area border routers for reducing the number of link states such as summary Link-State Advertisements (LSAs) to be distributed to other routers in other areas.

OSPF topology-transparent zone may resolve the issues above.

A topology-transparent zone comprises a group of routers and a number of links connecting these routers. Any router outside of the zone is not aware of the zone. The information about the links and routers inside the zone is not distributed to any router outside of the zone. Any link state change such as a link down inside the zone is not seen

by any router outside of the zone.

This document presents requirements for OSPF topology-transparent zone.

[2.](#) Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#).

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[3.](#) Requirements

Topology-Transparent Zone (TTZ) may be deployed for resolving some critical issues in existing networks and future networks. The requirements for TTZ are listed as follows:

- o TTZ MUST be backward compatible. When a TTZ is deployed on a set of routers in a network, the routers outside of the TTZ in the network do not need to know or support TTZ.
- o A group of nodes in an existing network SHOULD be able to migrate to a TTZ smoothly after the configuration of TTZ on these nodes is activated.
- o All the nodes in an existing TTZ SHOULD be able to migrate back to their OSPF area smoothly after the configuration of TTZ on these nodes is deleted.
- o TTZ MUST support at least one more levels of network hierarchies, in addition to the hierarchies supported by existing routing protocols.
- o Users SHOULD be able to easily set up an end to end service crossing TTZs.
- o The protections on the service crossing TTZs SHOULD be transparent to TTZ.
- o The configuration for a TTZ in a network SHOULD be minimum.

- o The changes on the existing protocols for supporting TTZ SHOULD be minimum.

[4.](#) Security Considerations

The mechanism described in this document does not raise any new security issues.

[5.](#) IANA Considerations

[6.](#) Acknowledgement

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