|  |
| --- |
| Multi-Area OSPF |
| Optimizing Large Networks with Special OSPF Areas |
|  |
|  |

Multi-Area OSPF

Optimizing Large Networks with Special OSPF Areas

# Purpose

This document outlines the use of Special OSPF Areas to optimize convergence time and Queuing delay in large networks.

# Background Information

Open Shortest Path First (OSPF) is an open standard link state routing protocol that uses cost as a metric to determine the shortest path to the destination network. OSPF can divide logical groups of routers into “Areas”. Routers must only maintain the topology information of the other routers in their common area. The use of many areas in a network topology, or Multi-Area OSPF, is a design technique that aids in the maintainability and scalability of large networks. Routing between different areas are done through an Area Border Router (ABR) that connects a given area and the backbone area. The backbone area is a special area type that must have an area number of zero and connects all areas in the topology. The backbone area is where all inter-area traffic must travel through.

## Link State Advertisements

Link State Advertisements (LSAs) is the mechanism routers use to communicate link state information. A collection of LSAs form the LSDB, which then forms the shortest path tree, which forms the routing table. There are 8 LSA Types, each describe a different part of the routing domain.

|  |  |  |  |
| --- | --- | --- | --- |
| LSA Type | LSA Name | Link-State ID | Description |
| 1 | Router | Router ID | Every router participating in OSPF will flood its area with a single Router LSA to describes the state and cost of all the router’s OSPF participating links. |
| 2 | Network | DR’s IP address | The Designated Router (DR) will describe all attached routers, including itself. |
| 3 | Network Summary | Network Number | Area Border Router (ABR) describes inter-area destinations. |
| 4 | ASBR Summary | OSBR Router ID | Area Border Router (ABR) describes inter-area destinations to a AS boundary router (ASBR). |