

OSPF Router Types:

OSPF utilizes different types of OSPF routers, which are determined by the role, & location of a router within an OSPF domain. There are four types of OSPF routers, which are determined by a router's function and/or location within an OSPF area. To verify a device's OSPF Router Type, use the `show ip ospf` command. This command tells if an OSPF router is an ABR or ASBR. It will not identify internal or Backbone routers, but if an OSPF router is not an ABR or ASBR, then it is an internal router. If it is not an ABR or an ASBR and it is in area 0, then it is a Backbone Router.

Internal Router:

An Internal Router have all "OSPF Interfaces" belong to the same OSPF area. These types of routers have a single link-state database because they belong to only one area. Internal routers (IRs) are routers who's directly connected networks all belong to the same OSPF area. These are also called adjacent routers or adjacent neighbors.

Backbone Router:

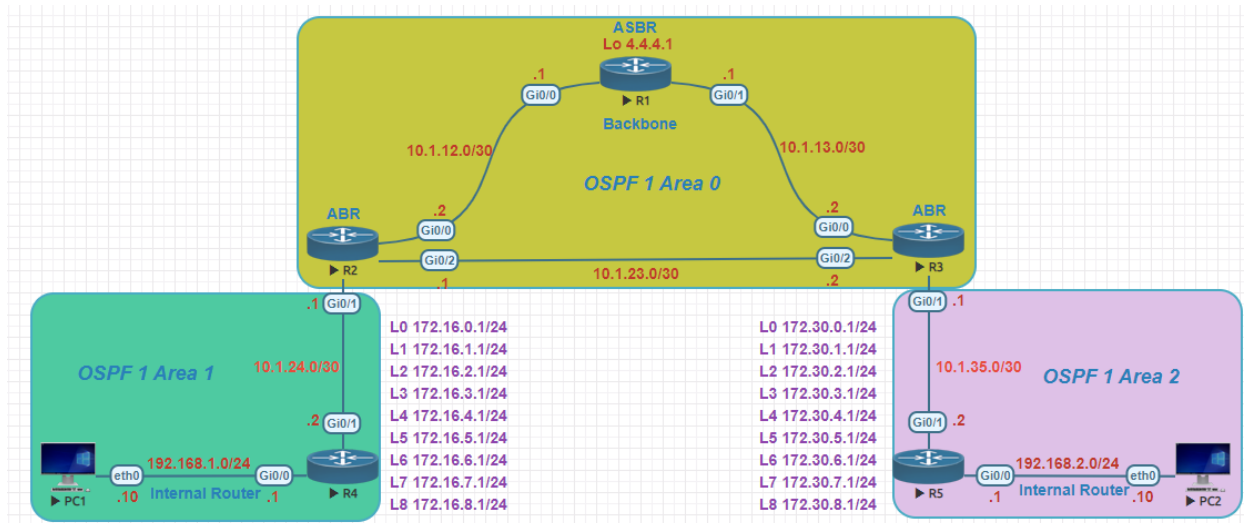
The area 0 is known as Backbone Area and the routers in area 0 are known as Backbone Routers. If the routers exist partially in the area 0 then also it is a Backbone Router. Backbone Routers have all interfaces configured/attached to area 0 (backbone).

Area Border Router (ABR):

ABR have at least one OSPF interface belongs to area 0 and at least one OSPF interface belong to a Non-Backbone Area (Area other than area 0). To check run `show ip protocols` command. The ABRs therefore maintain multiple link-state databases. The ABR has one database for each area that is summarized and then presented to the backbone for distribution to other areas. The Area Border Routers (ABRs) in OSPF are routers connecting different network areas to the backbone (area 0).

Autonomous System Boundary Router (ASBR):

A Router is said to be ASBR if it is one interface is in OSPF Domain and Other interface in any other Routing Domain such as RIP, EIGRP or BGP. These routers perform redistribution. ASBRs run both OSPF and another routing protocol. ASBRs advertise the exchanged external routing information throughout their AS. ASBRs are connected to more than one AS and exchange routing information with routers in another AS. ASBRs advertise the exchanged external routing information throughout their AS. An ASBR is a gateway to an external network. It redistributes routes from another external protocol/network, for example, static routes, EIGRP, BGP, etc., into the OSPF domain.



Make R1 ASBR

```
R1#show run | sec ospf
```

```
R1(config)#router ospf 1
```

```
R1(config-router)#no network 4.4.4.4 0.0.0.0 area 0
```

```
R1(config-router)#redistribute connected
```

```
R1#show ip protocols | sec It
```

It is an autonomous system boundary router

```
R1#
```

```
R1#show ip ospf | sec It
```

It is an autonomous system boundary router

```
R1#
```

```
R2#show ip protocols | sec It
```

It is an area border router

```
R2#show ip ospf | sec It
```

It is an area border router

```
R3#show ip ospf | sec It
```

It is an area border router

```
R3#
```

```
R3#show ip protocols | sec It
```

It is an area border router

```
--"
```

```
R4#show ip ospf | sec Area
```

Area 1

Number of interfaces in this area is 11 (9 loopback)

Area has no authentication

Area ranges are

```
R5#show ip ospf | sec Area
```

```
Area 2
```

```
Number of interfaces in this area is 11 (9 loopback)
Area has no authentication
Area ranges are
```

```
R1#show ip ospf
```

```
Routing Process "ospf 1" with ID 1.1.1.1
Start time: 00:10:34.714, Time elapsed: 02:54:33.792
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
It is an autonomous system boundary router
Redistributing External Routes from,
connected, includes subnets in redistribution
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 5000 msec
Minimum hold time between two consecutive SPFs 10000 msec
Maximum wait time between two consecutive SPFs 10000 msec
Incremental-SPF disabled
Minimum LSA interval 5 secs
Minimum LSA arrival 1000 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 1. Checksum Sum 0x002F60
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
Reference bandwidth unit is 100 mbps
```

```
Area BACKBONE(0)
```

```
Number of interfaces in this area is 2
```