

```
R6:Rip
conf t
int e0/0
Desc conn to R1
ip add 10.16.1.6 255.255.255.0
no sh
int lo 0
ip add 60.0.0.1 255.255.255.0
int lo 1
ip add 66.0.0.1 255.255.255.0
exit
```

```
Router rip
ver 2
no au
net 10.0.0.0
net 60.0.0.0
net 66.0.0.0
exit
```

```
R1: ASBR
conf t
int e0/2
Desc conn to Rip NW
ip add 10.16.1.1 255.255.255.0
no sh
int e0/0
Desc conn to R2-ABR
ip add 10.12.1.1 255.255.255.0
no shut
int e0/1
Desc conn to R3-ABR
ip add 10.13.1.1 255.255.255.0
no sh
exit
```

```
Router rip
ver 2
no au
net 10.16.1.0
redistribute ospf 1 metric 1
exit
```

```
Router ospf 1
router-id 1.1.1.1
net 10.12.1.1 0.0.0.0 a 0
net 10.13.1.1 0.0.0.0 a 0
Redistribute rip subnets route-map RM-RIP
exit
```

```
Access-list 1 permit 60.0.0.0 0.0.0.255
Access-list 2 permit 66.0.0.0 0.0.0.255
```

```
Route-map RM-RED permit 10
match ip add 1
```

```
set metric-type type-1
Route-map RM-RED permit 20
match ip add 2
set metric-type type -2
exit
```

=====

```
R2:ABR
conf t
int e0/0
Desc conn to R1
ip add 10.12.1.2 255.255.255.0
no shut
int e0/1
Desc conn to R4
ip add 10.24.1.2 255.255.255.0
no shut
exit
```

```
Router ospf 1
Router-id 2.2.2.2
net 10.12.1.2 0.0.0.0 area 0
net 10.24.1.2 0.0.0.0 area 1
exit
```

```
R3
conf t
int e0/0
Desc conn to R1
ip add 10.13.1.3 255.255.255.0
no shut
int e0/1
Desc conn to R4
ip add 10.34.1.3 255.255.255.0
no shut
exit
```

```
Router ospf 1
Router-id 3.3.3.3
net 10.13.1.3 0.0.0.0 area 0
net 10.34.1.3 0.0.0.0 area 1
exit
```

```
R5:Eigrp 100
conf t
int e0/0
Desc conn to R4
ip add 10.45.1.5 255.255.255.0
no sh
int lo 0
ip add 50.0.0.1 255.255.255.0
int lo 1
```

```
ip add 55.0.0.1 255.255.255.0
exit
```

```
Router eigrp 100
net 10.45.1.5 0.0.0.0
net 50.0.0.1 0.0.0.0
net 55.0.0.1 0.0.0.0
exit
```

=====

R4: NSSA ASBR

```
conf t
int e0/0
Desc conn to R2
ip add 10.24.1.4 255.255.255.0
no sh
int e0/1
Desc conn to R3
ip add 10.34.1.4 255.255.255.0
no sh
int lo 0
ip add 222.222.222.222 255.255.255.0
int e0/2
Desc conn to Eigrp 100
ip add 10.45.1.4 255.255.255.0
no sh
exit
```

```
Router eigrp 100
net 10.45.1.4 0.0.0.0
redistribute ospf 1 metric 10000 1000 255 1 1500
exit
```

```
Access-list 1 permit 50.0.0.0 0.0.0.255
Access-list 2 permit 55.0.0.0 0.0.0.255
```

```
Route-map RM-EIGRP permit 10
match ip add 1
set metric-type type-1
Route-map RM-EIGRP permit 20
match ip add 2
set metric-type type-2
exit
```

```
Router ospf 1
router-id 4.4.4.4
net 10.24.1.4 0.0.0.0 area 1
net 10.34.1.4 0.0.0.0 area 1
Redistribute eigrp 100 subnets route-map RM-EIGRP
exit
```

NSSA:

Area 0 cannot NSSA

ABR blocks LSA type 4,5
Allows type 1,2,3
NSSA ASBR converts LSA type 5 to LSA type 7
LSA type 7 will be propagated within the NSSA area
ABR receives N1/N2 routes with P bit set (P=1)
ABR owns the NSSA external routes
Translates them into LSA type 5 and injects into other areas
No LSA type 4 is generated
NSSA area loses connectivity with external Networks
default-information-originate is used to generate a default route
of type 7 N*2 0.0.0.0

ABR
R2/R3

```
router ospf 1  
area 1 nssa default-information-originate  
exit
```

Total NSSA

Area 0 cannot NSSA
ABR blocks LSA type 3,4,5
Allows type 1,2,3-Default route
NSSA ASBR converts LSA type 5 to LSA type 7
LSA type 7 will be propagated within the NSSA area
ABR receives N1/N2 routes with P bit set (P=1)
ABR owns the NSSA external routes
Translates them into LSA type 5 and injects into other areas
No LSA type 4 is generated
ABR injects a type 3 Default route into NSSA area

ABR
R2/R3

```
router ospf 1  
no area 1 nssa default-information-originate  
area 1 nssa no-summary  
exit
```

Area type
Normal
E=1
N=0

Stub
E=0
N=0

NSSA
E=0
N=1

LSupdate
option

P=1 (Translate)

Virtual -links

R1

conf t

int e0/0

Desc conn to R2-ABR

ip add 10.12.1.1 255.255.255.0

no shut

int lo 0

ip add 8.8.8.8 255.0.0.0

router ospf 1

router-id 1.1.1.1

net 10.12.1.1 0.0.0.0 a rea 0

redistribute connected route-map RM-LO

exit

route-map RM-LO permit 10

match interface Loopback0

exit

R2:ABR

conf t

int e0/0

Desc conn to R1

ip add 10.12.1.2 255.255.255.0

no shut

int e0/1

Desc conn to R3-Area 1

ip add 10.23.1.2 255.255.255.0

no shut

exit

router ospf 1

router-id 2.2.2.2

net 10.12.1.2 0.0.0.0 a 0

net 10.23.1.2 0.0.0.0 a 1

exit

R3:

conf t

int e0/0

Desc conn to R2

ip add 10.23.1.3 255.255.255.0

no shut

int e0/1

Desc conn to R4

ip add 10.34.1.3 255.255.255.0

no shut

exit

router ospf 1

```
router-id 3.3.3.3
net 10.0.0.0 0.255.255.255 area 1
exit
```

```
R4:BR
conf t
int e0/1
Desc conn to R5 in area 2
ip add 10.45.1.4 255.255.255.0
no shut
int e0/0
Desc conn to R3
ip add 10.34.1.4 255.255.255.0
no shut
exit
```

```
router ospf 1
router-id 4.4.4.4
net 10.34.1.4 0.0.0.0 area 1
net 10.45.1.4 0.0.0.0 area 2
exit
```

```
R5:Area 2
conf t
conf t
int e0/0
Desc conn to R4 in area 2
ip add 10.45.1.5 255.255.255.0
no shut
ip ospf 1 a 2
exit
```