R1:
conf t
int e0/1
Desc conn to R2
ip add 10.12.1.1 255.255.255.0
no sh
int e0/0
Desc LAN
ip add 192.168.1.1 255.255.255.0
no sh
exit

R2
conf t
int e0/0
Desc conn to R1
ip add 10.12.1.2 255.255.255.0
no sh
int e0/1
Desc conn to R3
ip add 10.23.1.2 255.255.255.0
no sh
int e0/2
Desc LAN
ip add 10.2.2.2 255.255.255.0
no sh
exit

R3:
conf t
int e0/0
Desc conn to R3
ip add 10.23.1.3 255.255.255.0
no sh
int e0/1
Desc LAN
ip add 172.16.3.3 255.255.255.0
no sh
exit

1.Directly connected same subnet

2.Same Area ID
%OSPF-4-ERRRCV: Received invalid packet: mismatched area ID from backbone area from 10.12.1.1

3. Same Area Type Normal,Stub,NSSA

R1
router ospf 1
area 1 stub
exit

R2: Normal

Neig will fail

4.Authentication
Type 0 Null
Type 1 Simple password (clear text/plain text)
Type 2 Cryptographic   (Md5 hash)

Authentication:
R1----------R2   --> Simple password

R1:
  router ospf 1
 area 1 authentication
exit

int e0/1
ip ospf authentication-key cisco123
exit

R2:

int e0/0
ip ospf authentication
ip ospf authentication-key cisco123
exit

sh ip ospf int e0/1

R2-------R3 --> Cryptographic Auth

R2
int e0/1
ip ospf authentication message-digest
 ip ospf message-digest-key 10 md5 cisco456
exit

R3
int e0/0
ip ospf authentication message-digest
 ip ospf message-digest-key 10 md5 cisco456
exit

5.Passive Interfaces:

R1
Router ospf 1
passive-interface default

no passive-interface e0/1
exit

R2
Router ospf 1
passive-interface e0/2
exit

6.MTU

R1:
int e0/1
ip mtu 1400
exit

R2
int e0/0
Mtu 1500 Default

Exstart/Exchange

R1
int e0/1
ip ospf mtu-ignore
exit

7.Duplicate RID
R1
1.1.1.1
R2
1.1.1.1

1.Directly connected neig using same RID

OSPF-4-DUP_RTRID_NBR: OSPF detected duplicate router-id 1.1.1.1 from 10.12.1.2 on interface Et

2.Two ospf in same area configured with same RID

R1 ----------R2----------R3
RID 1.1.1.1 RID 2.2.2.2 RID 1.1.1.1

R2 will keep the LSDB of neig with latest update.

3.Same RID in different areas
No issues because ABR injects routes from one area into another.

4.One Router in area 1 has RID 1.1.1.1 (R1)
ASBR-R3 also configured with same RID 1.1.1.1

R1 ----------R2----------R3 ASBR
RID 1.1.1.1 RID 2.2.2.2 RID 1.1.1.1

R1 will not accept external routes from R3.

Hello interval
R1
int e0/1
ip ospf hello-interval 20
exit

R1 R2
20/80 10/40
Neig fails

Network Types:

R1:
conf t
int e0/0
Desc conn to R2/R3
ip add 10.123.1.1 255.255.255.0
no sh
int e0/1
Desc LAN
ip add 192.168.1.1 255.255.255.0
no sh
exit

R2:
conf t
int e0/0
Desc conn to R1
ip add 10.123.1.2 255.255.255.0
no sh
int e0/1
Desc LAN
ip add 192.168.2.2 255.255.255.0
no sh
exit

R3:
conf t
int e0/0
Desc conn to R1
ip add 10.123.1.3 255.255.255.0
no sh
int e0/1
Desc LAN
ip add 192.168.3.3 255.255.255.0
no sh

exit

All routers
Router ospf 1
net 0.0.0.0 255.255.255.255 a 0
exit

==========

R2
int e0/0
ip ospf network point-to-point
exit

Neig will remain but LSDB is not exchanged.

R2(config-if)#do sh ip ospf nei

Neighbor ID	Pri	State	Dead Time	Address	Interface
1.1.1.1	0	FULL/ -	00:00:33	10.123.1.1	Ethernet0/0

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	1	FULL/BDR	00:00:32	10.123.1.2	Ethernet0/0

==========

R1: point-to-Multipoint
R2/R3: point-to-point

R1
int e0/0
ip ospf network point-to-Multipoint
ip ospf hello-interval 10
exit

R2/R3
int e0/0
ip ospf network point-to-point
exit

R2:
Access-list 100 deny ospf host 10.123.1.3 any
Access-list 100 permit ip any any
int e0/0
ip access-group 100 in
exit

R3:
Access-list 100 deny ospf host 10.123.1.2 any
Access-list 100 permit ip any any
int e0/0
ip access-group 100 in

exit
==========