

OSPF Operations



- 1. Discover neighbours**
- 2. Form adjacencies**
- 3. Flood Link State Database (LSDB)**
4. Compute Shortest Path
5. Install best routes in routing table
6. Respond to network changes

OSPF Packet Types



- **Hello:** A router will send out and listen for Hello packets when OSPF is enabled on an interface, and form adjacencies with other OSPF routers on the link
- **DBD DataBase Description:** Adjacent routers will tell each other the networks they know about with the DBD packet
- **LSR Link State Request:** If a router is missing information about any of the networks in the received DBD, it will send the neighbour an LSR

OSPF Packet Types (Cont.)



- **LSA Link State Advertisement:** A routing update
- **LSU Link State Update:** Contains a list of LSA's which should be updated, used during flooding
- **LSAck:** Receiving routers acknowledge LSAs

Hello Packets



- OSPF routers discover each other and form adjacencies via Hello packets
- They send Hello packets out each interface where OSPF is enabled (except passive interfaces)
- Multicast to 224.0.0.5 ('all OSPF routers')
- Sent every 10 seconds by default

Hello Packet Contents



- **Router ID:** 32 bit number that uniquely identifies each OSPF router
- **Hello Interval:** How often router sends Hello packets. Default 10 secs.
- **Dead Interval:** How long a router waits to hear from a neighbor before declaring it out of service. Default 4x Hello Interval.
- **Neighbors:** A list of adjacent OSPF routers that this router has received a Hello packet from.

Hello Packet Contents (Cont.)



- **Area ID:** The area configured for that interface
- **Router Priority:** An 8 bit number used to select DR and BDR.
- **DR and BDR IPv4 Address:** If known.
- **Authentication Flag:** Authentication details if configured.
- **Stub Area Flag:** If the area is a stub area. Stub areas have a default route to their ABR rather than learning routes outside the area.

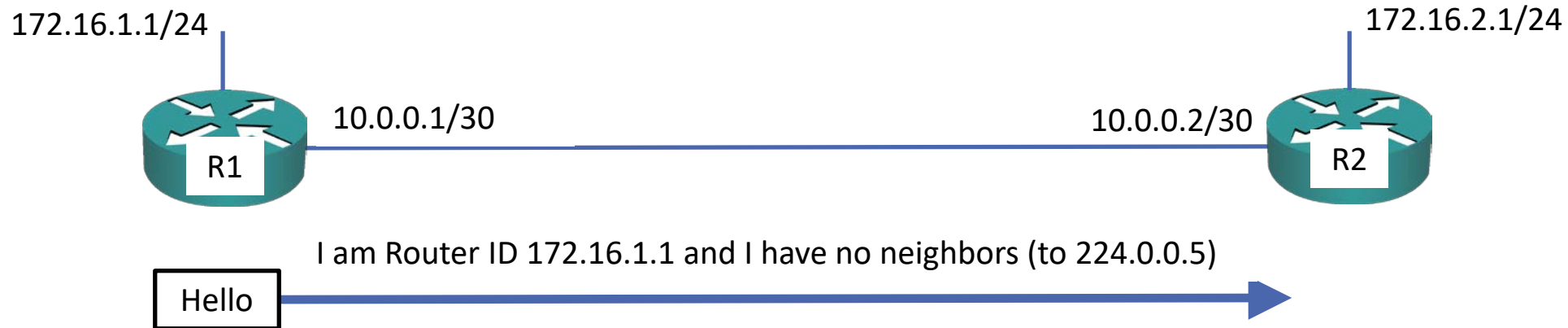
Hello Packet Contents (Cont.)



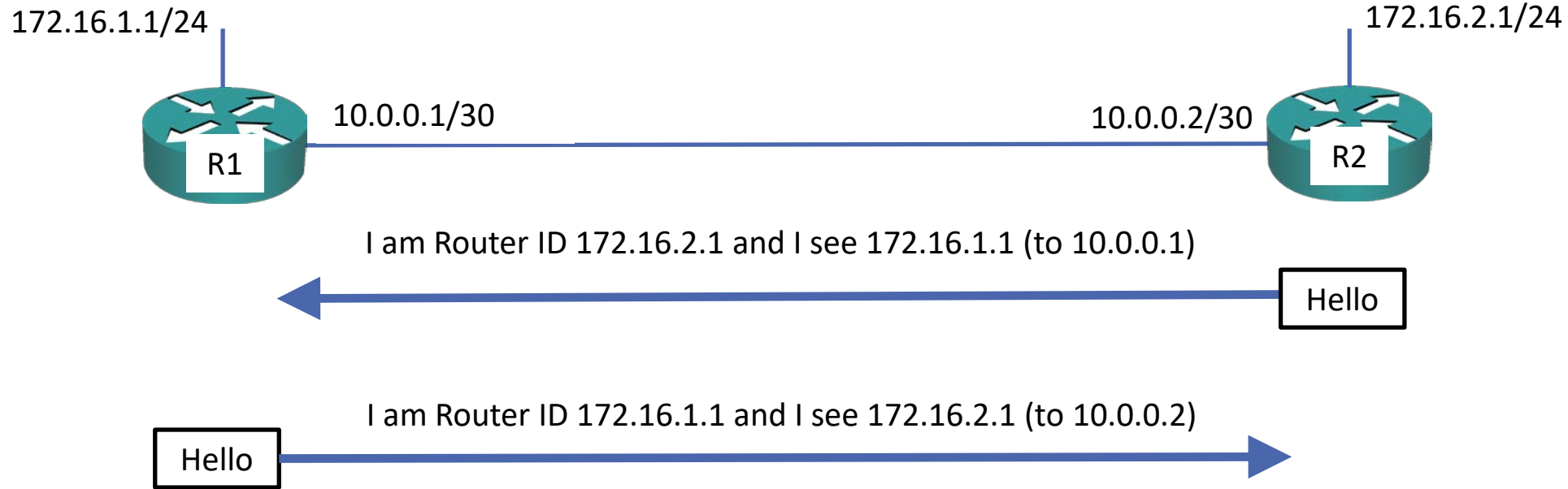
These settings must match for a pair of OSPF routers to form an adjacency with each other:

- Must be in each other's Neighbor list
- Hello and Dead Intervals
- Area ID
- IP subnet
- Authentication Flag
- Stub Area Flag

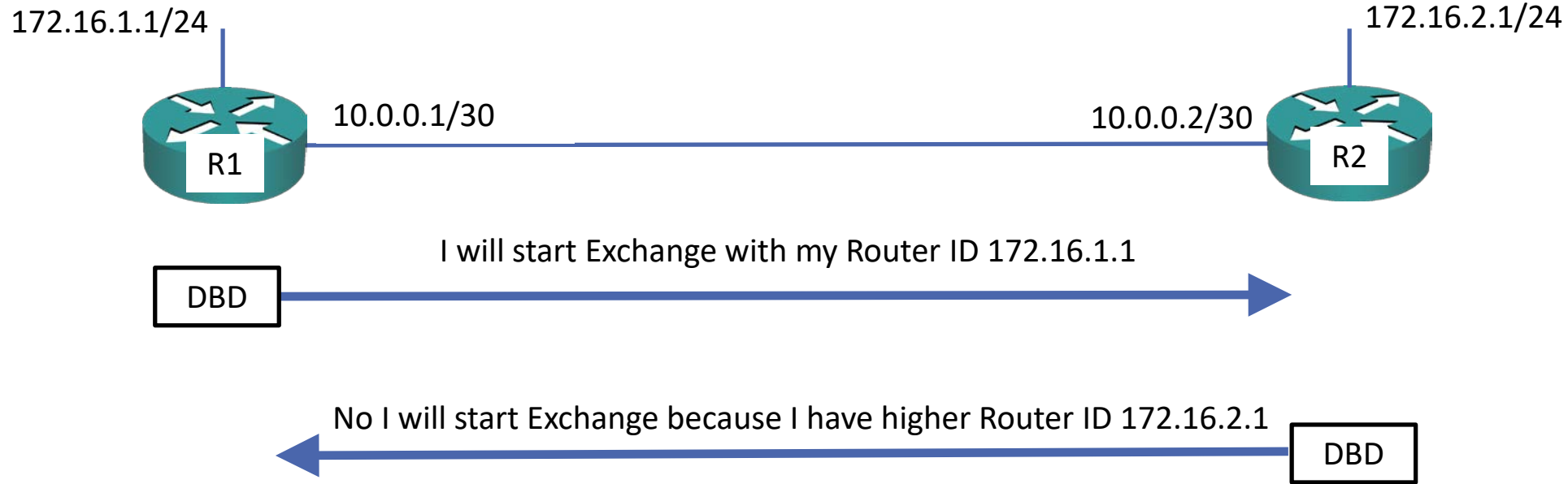
Neighbor States - Down



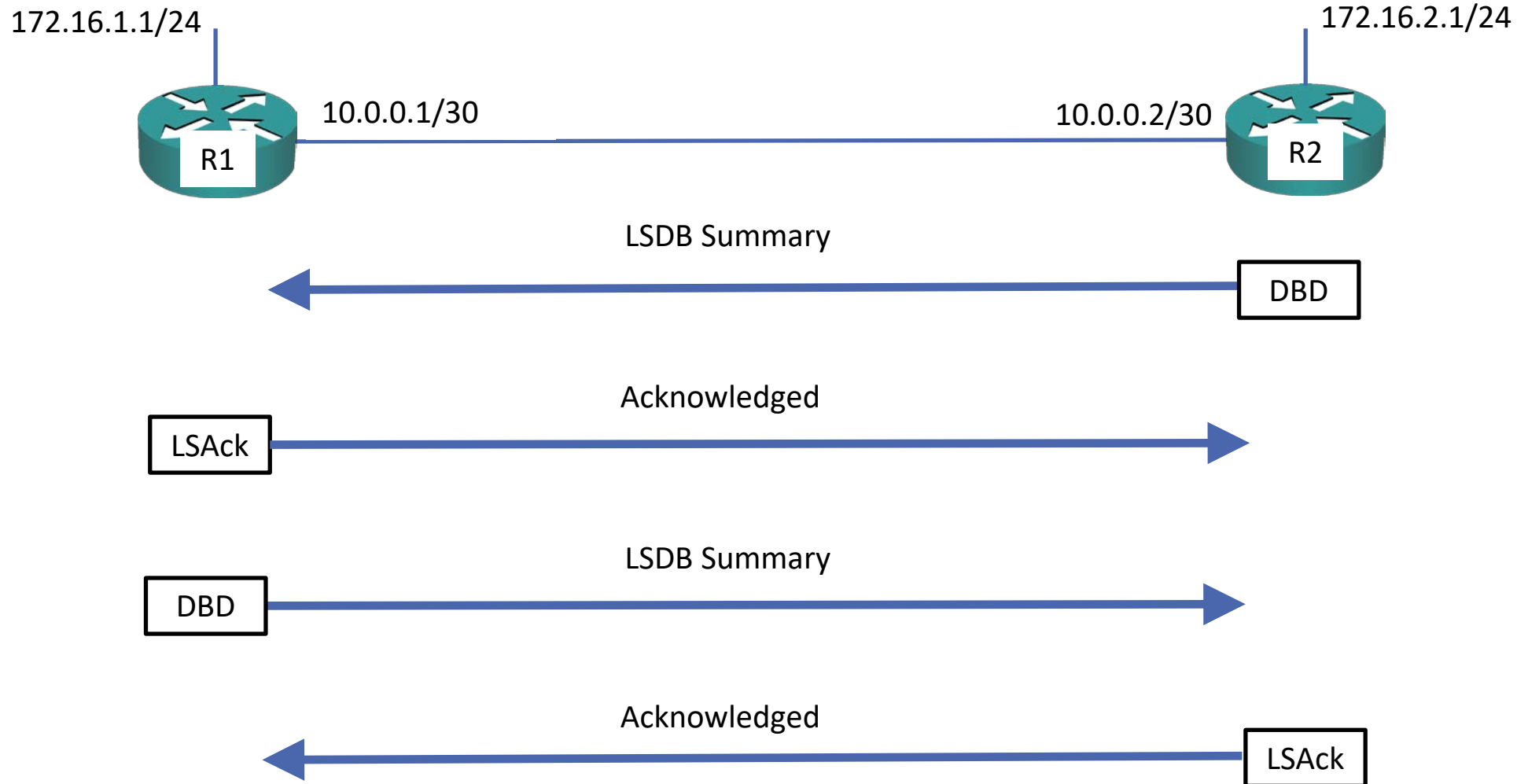
Neighbor States – 2-Way



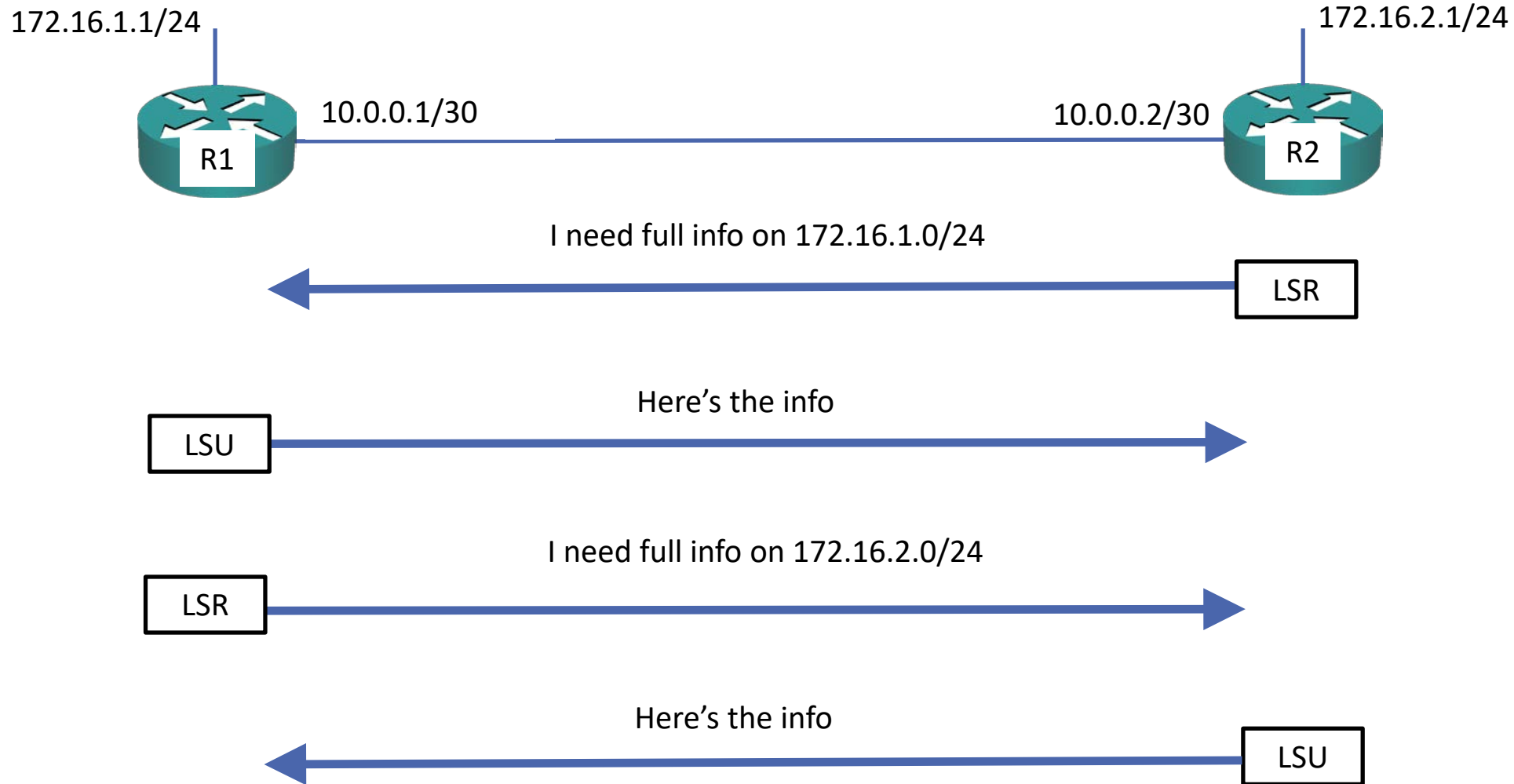
Neighbor States - Exchange



Neighbor States – Exchange (Cont.)



Neighbor States – Loading



Neighbor States - Full

