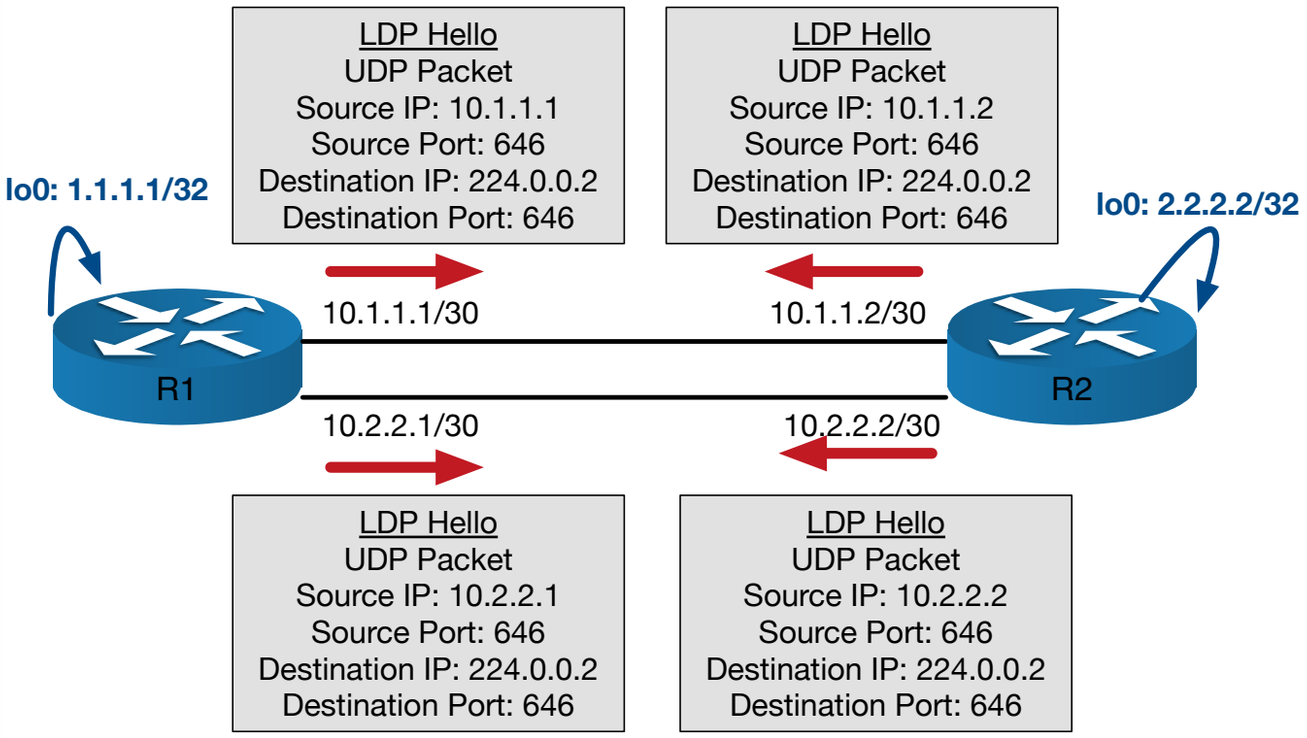
# LDP Discovery




Source address of the LDP Hello packet is the egress interface.

Destination is the multicast ***all routers*** address (224.0.0.2). The TTL of LDP Hello packets is 1.

This will cause one **HELLO ADJACENY** *per interface* to be formed. The **IPv4 Transport TLV** is what the LDP **SESSION** will be built towards (and thus must be reachable).

Verify adjacencies using **`show mpls ldp discovery`** command (for IOS and XR)

**Contents of an LDP Hello Message**
**The LDP Label Space ID:** <router-id>:<label-space>
**IPv4 Transport TLV**: <transport-addr>

Discovery defaults are as follows:
**Hello:** 5 seconds
**Holdtime:** 15 seconds

The IPv4 Transport Address defaults to the Router ID. You can change it using the IOS command

```
interface <interface>
  mpls ldp discovery transport-address [interface | <ip-address>]
```

...or the XR command

```
mpls ldp
 interface <interface>
  address-family ipv4
    discovery transport-address [interface | <ip-address>]
```

This controls what is shown in the ***IPv4 Transport TLV*** field and thus what IP the LDP neighbor will try to establish a TCP session with. It does not change the LDP Neighbor Identifier when the TCP sessions is established - it just changes the transport address used to establish that neighborship.

**Router ID**

The router-id is the first of these conditions to be met:

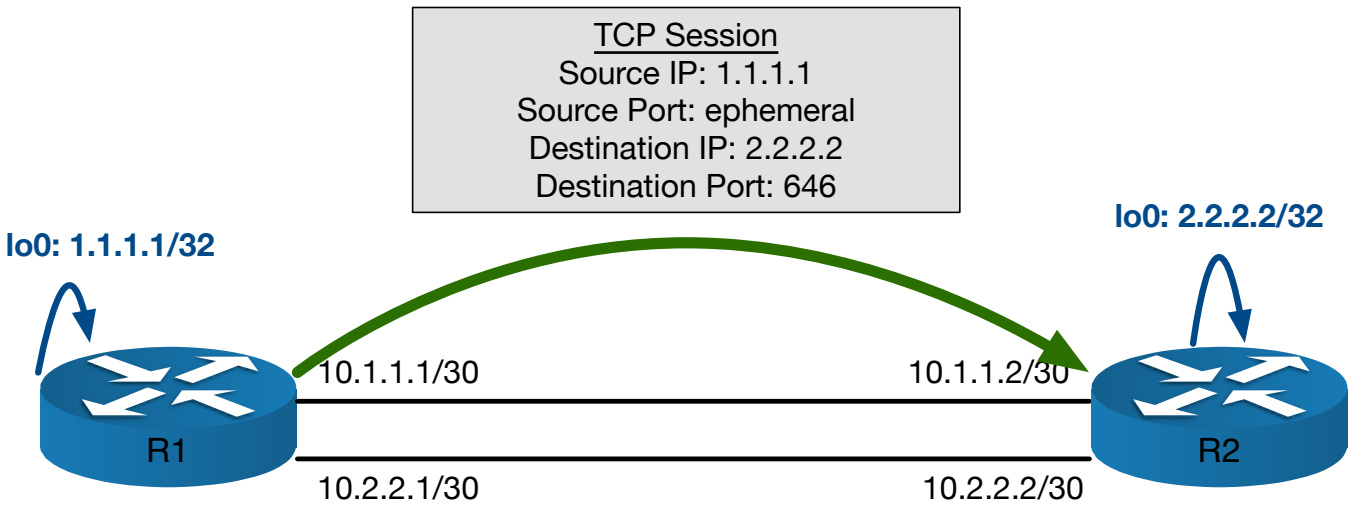
1. Interface mentioned in the ***mpls ldp router-id*** command
2. The highest numbered loopback
3. The highest numbered interface IP

**Label Space**

Label space is either platform wide or per-interface. Ethernet uses platform wide meaning that an assigned label is significant to the whole platform and cannot overlap between interfaces. This is the default and is represented by a 0 after the colon in the label space ID. An example of a protocol using per-interface label-space is ATM.

by Steven Crutchley

# LDP Neighborships




The router with the lower router ID establishes a TCP session to the router with the higher router ID.

The TCP session is built from the **IPv4 Transport TLV** communicated in the hello messages. This defaults to the router ID but could have been overwritten (see previous page).

TCP sessions used to exchange the label bindings using TLVs.

This will cause one **TCP SESSION** per pair of neighbors. In this case you will have two **HELLO ADJACENCIES** but only one **TCP SESSION** (or neighborship) between the routers.

Verify neighborship using
**`show mpls ldp neighbor`**
command (for IOS and XR)

Keepalives are sent back and forth once the TCP session is established. They have the following defaults:
**Keepalive interval:** 60 seconds
**Holdtime:** 180 seconds

# LDP Modes

| Mode | Options |
|---|---|
| Label Distribution/ Advertisement Mode | **Downstream on Demand (DoD):** Each LSR will request a label for a given prefix from the downstream LSR (determined by the next hop in the routing table).<br>**Unsolicited Downstream (UD):** Each LSR distributes a binding to its neighbor without being requested. The is default for Ethernet. |
| Label Retention Mode | **Liberal Label Retention (LLR):** All received labels are kept in the LIB. Typically, only one of these will make it to the LFIB but recovery will be faster if the primary path fails.<br>**Conservative Label Retention (CLR):** Only the remote bindings that are associated with the next hop are kept. Memory is conserved at the cost of longer failover times. Usually only LC-ATM uses this mode. |
| LSP Control Mode | **Independent:** The LSR creates a local label for a FEC independent of other LSRs. This usually means the prefix for the FEC is in the routing table. This could result in black holing as some devices will start label forwarding before the LSP is complete, but is a faster method for communicating labels (default for Cisco)<br>**Ordered:** The LSR will only create a local binding if it either recognises itself as the egress LSR for a FEC or if it receives a label binding from the next-hop for a FEC (default for Junos) |