

CCIE Service Provider Lab Workbook v4.0 (<http://labs.ine.com/workbook/toc/service-provider-v4>) » CCIE SP v4 Advanced Technology Labs - MPLS

LDP Authentication

« [LDP IS-IS Autoconfig \(/workbook/view/service-provider-v4/task/ldp-is-is-autoconfig-Mjg0OA%3D%3D\)](#) | [LDP Label Allocation Filtering \(/workbook/view/service-provider-v4/task/ldp-label-allocation-filtering-Mjg1MA%3D%3D\)](#) »

Last updated: April 23, 2016

Note:

Initial Configuration & Diagrams: Load the initial configuration files for either the section named **OSPFv2** or **IS-IS**, which can be found in [CCIE SPv4 Topology Diagrams & Initial Configurations \(http://labs.ine.com/workbook/view/service-provider-v4/task/ccie-spv4-topology-diagrams-initial-configs\)](http://labs.ine.com/workbook/view/service-provider-v4/task/ccie-spv4-topology-diagrams-initial-configs). Refer to the **Base IPv4 Diagram** in order to complete this task.

Task

- Configure MPLS Label Distribution with LDP on all links connecting R2, R3, R4, R5, R6, and XR1.
- Statically set their MPLS LDP Router-IDs to be their Loopback0 interfaces.
- Configure authentication for the LDP peerings as follows:
 - R2 and R3 should authenticate their LDP session with the password "R2R3PASS".
 - R2 and R4 should authenticate their LDP session with the password "R2R4PASS".
 - R3, R4, R5, and R6 should all require that every LDP session use authentication.
 - R5 should use the default password "R5PASS" for all sessions.
 - R4, R6, and XR1 should all use the password "R5PASS" for their peering to R5.
 - R3, R4, and R6 should use password option 1 with the password "R3R4R6PASS" to authenticate their peerings as a group.
 - R6 and XR1 should fallback to the default password "DEFAULTPASS" for any other unmatched sessions.

Configuration Click to expand

```
R2:
router ospf 1
  mpls ldp autoconfig
  !
  mpls ldp router-id Loopback0
  !
  mpls ldp neighbor 3.3.3.3 password R2R3PASS
  mpls ldp neighbor 4.4.4.4 password R2R4PASS

R3:
router ospf 1
  mpls ldp autoconfig
  !
  mpls ldp router-id Loopback0
  !
  mpls ldp password required
  mpls ldp password option 1 for R3_R4_R6 R3R4R6PASS
  mpls ldp neighbor 2.2.2.2 password R2R3PASS
  !
  ip access-list standard R3_R4_R6
    permit 3.3.3.3
    permit 4.4.4.4
    permit 6.6.6.6

R4:
router ospf 1
  mpls ldp autoconfig
  !
  mpls ldp router-id Loopback0
  !
  mpls ldp password required
  mpls ldp password option 1 for R3_R4_R6 R3R4R6PASS
  mpls ldp neighbor 2.2.2.2 password R2R4PASS
  mpls ldp neighbor 5.5.5.5 password R5PASS
  !
  ip access-list standard R3_R4_R6
    permit 3.3.3.3
    permit 4.4.4.4
    permit 6.6.6.6

R5:
router ospf 1
  mpls ldp autoconfig
  !
  mpls ldp router-id Loopback0
  !
  mpls ldp password required
  mpls ldp password fallback R5PASS

R6:
router ospf 1
  mpls ldp autoconfig
  !
```

```
mpls ldp router-id Loopback0
!
mpls ldp password required
mpls ldp password option 1 for R3_R4_R6 R3R4R6PASS
mpls ldp password fallback DEFAULTPASS
mpls ldp neighbor 5.5.5.5 password R5PASS
!
ip access-list standard R3_R4_R6
 permit 3.3.3.3
 permit 4.4.4.4
 permit 6.6.6.6
XR1:
router ospf 1
 mpls ldp auto-config
!
mpls ldp
 router-id 19.19.19.19
 neighbor password clear DEFAULTPASS
 neighbor 5.5.5.5 password clear R5PASS
```

Verification

LDP Authentication, similar to BGP Authentication, uses the MD5 hash field of the TCP header for peer authentication. The neighbor address that should be matched for authentication is the LDP Router-ID, not the interface IP address nor the LDP transport address.

As seen in this example, authentication can be configured on a per-neighbor basis, for a group of neighbors with the **password option** syntax, or as a default password with the **fallback** option. The **mpls ldp password required** command in regular IOS stops the formation of new LDP peerings that do not have the correct password configured. For example in R2's case we have not configured the **password required** option, so if a new peer were discovered R2 would form the peering even though there is no password configured.

Final verification of this configuration is based on whether the LDP peerings properly establish, and from the detailed output below we can see whether the password is configured per neighbor, per option, or for fallback, and whether or not authentication is required.

```
R2#show mpls ldp neighbor detail | include Peer LDP Ident|MD5|Password Peer LDP Ident:
3.3.3.3:0; Local LDP Ident 2.2.2.2:0 TCP connection: 3.3.3.3.28273 - 2.2.2.2.646; MD5 on Password:
not required, neighbor, in use Peer LDP Ident: 4.4.4.4:0; Local LDP Ident 2.2.2.2:0 TCP connection:
4.4.4.4.16814 - 2.2.2.2.646; MD5 on Password: not required, neighbor, in use
```

```
R3#show mpls ldp neighbor detail | include Peer LDP Ident|MD5|Password Peer LDP Ident:
2.2.2.2:0; Local LDP Ident 3.3.3.3:0 TCP connection: 2.2.2.2.646 - 3.3.3.3.42712; MD5 on Password:
required, neighbor, in use Peer LDP Ident: 4.4.4.4:0; Local LDP Ident 3.3.3.3:0 TCP connection:
4.4.4.4.51384 - 3.3.3.3.646; MD5 on Password: required, option 1, in use Peer LDP Ident: 6.6.6.6:0;
Local LDP Ident 3.3.3.3:0 TCP connection: 6.6.6.6.40642 - 3.3.3.3.646; MD5 on Password: required,
option 1, in use
```

R4#show mpls ldp neighbor detail | include Peer LDP Ident|MD5|Password

```
Peer LDP Ident: 2.2.2.2:0; Local LDP Ident 4.4.4.4:0
  TCP connection: 2.2.2.2.646 - 4.4.4.4.28273; MD5 on
  Password: required, neighbor, in use

Peer LDP Ident: 3.3.3.3:0; Local LDP Ident 4.4.4.4:0
  TCP connection: 3.3.3.3.646 - 4.4.4.4.51384; MD5 on
  Password: required, option 1, in use

Peer LDP Ident: 6.6.6.6:0; Local LDP Ident 4.4.4.4:0
  TCP connection: 6.6.6.6.39672 - 4.4.4.4.646; MD5 on
  Password: required, option 1, in use

Peer LDP Ident: 5.5.5.5:0; Local LDP Ident 4.4.4.4:0
  TCP connection: 5.5.5.5.40136 - 4.4.4.4.646; MD5 on
  Password: required, neighbor, in use
```

R5#show mpls ldp neighbor detail | include Peer LDP Ident|MD5|Password

```
Peer LDP Ident: 6.6.6.6:0; Local LDP Ident 5.5.5.5:0
  TCP connection: 6.6.6.6.54049 - 5.5.5.5.646; MD5 on
  Password: required, fallback, in use

Peer LDP Ident: 4.4.4.4:0; Local LDP Ident 5.5.5.5:0
  TCP connection: 4.4.4.4.646 - 5.5.5.5.29501; MD5 on
  Password: required, fallback, in use

Peer LDP Ident: 19.19.19.19:0; Local LDP Ident 5.5.5.5:0
  TCP connection: 19.19.19.19.24927 - 5.5.5.5.646; MD5 on
  Password: required, fallback, in use
```

R6#show mpls ldp neighbor detail | include Peer LDP Ident|MD5|Password

```
Peer LDP Ident: 3.3.3.3:0; Local LDP Ident 6.6.6.6:0
  TCP connection: 3.3.3.3.646 - 6.6.6.6.12509; MD5 on
  Password: required, option 1, in use

Peer LDP Ident: 5.5.5.5:0; Local LDP Ident 6.6.6.6:0
  TCP connection: 5.5.5.5.646 - 6.6.6.6.54049; MD5 on
  Password: required, neighbor, in use

Peer LDP Ident: 4.4.4.4:0; Local LDP Ident 6.6.6.6:0
  TCP connection: 4.4.4.4.646 - 6.6.6.6.38312; MD5 on
  Password: required, option 1, in use

Peer LDP Ident: 19.19.19.19:0; Local LDP Ident 6.6.6.6:0
  TCP connection: 19.19.19.19.29593 - 6.6.6.6.646; MD5 on
  Password: required, fallback, in use
```

RP/0/0/CPU0:XR1#show mpls ldp neighbor detail

Fri May 1 00:48:10.624 UTC

```
Peer LDP Identifier: 5.5.5.5:0
  TCP connection: 5.5.5.5:646 - 19.19.19.19:20747; MD5 on
  Graceful Restart: No
  Session Holdtime: 180 sec
  State: Oper; Msgs sent/rcvd: 25/25; Downstream-Unsolicited
  Up time: 00:02:59
  LDP Discovery Sources:
    GigabitEthernet0/0/0.519
```

Addresses bound to this peer:

5.5.5.5 20.4.5.5 20.5.6.5 20.5.19.5

Peer holdtime: 180 sec; KA interval: 60 sec; Peer state: Estab

NSR: Disabled

Capabilities:

Sent:

0x508 (MP: Point-to-Multipoint (P2MP))

0x509 (MP: Multipoint-to-Multipoint (MP2MP))

0x50b (Typed Wildcard FEC)

Received:

0x508 (MP: Point-to-Multipoint (P2MP))

0x509 (MP: Multipoint-to-Multipoint (MP2MP))

0x50b (Typed Wildcard FEC)

Peer LDP Identifier: 6.6.6.6:0

TCP connection: 6.6.6.6:646 - 19.19.19.19:18275; MD5 on

Graceful Restart: No

Session Holdtime: 180 sec

State: Oper; Msgs sent/rcvd: 25/25; Downstream-Unsolicited

Up time: 00:02:55

LDP Discovery Sources:

GigabitEthernet0/0/0/0.619

Addresses bound to this peer:

6.6.6.6 20.3.6.6 20.4.6.6 20.5.6.6

20.6.19.6

Peer holdtime: 180 sec; KA interval: 60 sec; Peer state: Estab

NSR: Disabled

Capabilities:

Sent:

0x508 (MP: Point-to-Multipoint (P2MP))

0x509 (MP: Multipoint-to-Multipoint (MP2MP))

0x50b (Typed Wildcard FEC)

Received:

0x508 (MP: Point-to-Multipoint (P2MP))

0x509 (MP: Multipoint-to-Multipoint (MP2MP))

0x50b (Typed Wildcard FEC)

« LDP IS-IS Autoconfig (/workbook/view/service-provider-v4/task/ldp-is-is-autoconfig-Mjg0OA%3D%3D) | LDP Label Allocation Filtering (/workbook/view/service-provider-v4/task/ldp-label-allocation-filtering-Mjg1MA%3D%3D)

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