

# CDP, LLDP, and NTP Configuration Lab Report

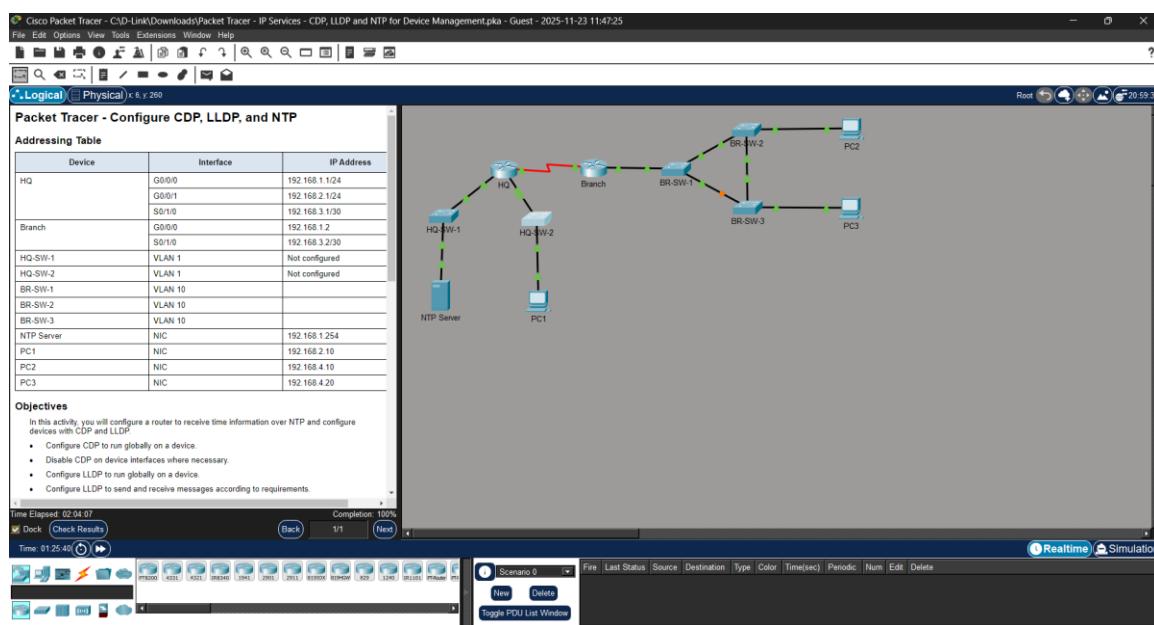
## 1. Introduction

This report documents the configuration and verification of CDP (Cisco Discovery Protocol), LLDP (Link Layer Discovery Protocol), and NTP (Network Time Protocol) across the HQ and Branch network infrastructure. The objective is to enable secure discovery protocols, disable unwanted protocol traffic on access ports, configure LLDP according to network design, and synchronize the HQ router to an NTP server for accurate timekeeping.

## 2. Network Topology Overview

The completed network topology, as shown in the screenshot below, consists of HQ and Branch routers connected through a WAN serial link. HQ is connected to two distribution switches (HQ-SW1 and HQ-SW2), while the Branch router connects to BR-SW1, BR-SW2, and BR-SW3. An NTP server is located at the HQ side.

Figure 1: Completed Network Topology



### 3. CDP and LLDP Configuration

This section provides labeled screenshots validating CDP enablement on Branch devices and LLDP configuration across HQ routers and switches. CDP was activated on Branch, and disabled on HQ side to improve security. LLDP was enabled on HQ and configured for controlled direction on uplinks and disabled on access ports.

Figure 2: HQ Router - LLDP Interface Configuration and Status

The image shows a terminal window titled "HQ-SW-2" with the tab "CLI" selected. The window displays the following text:

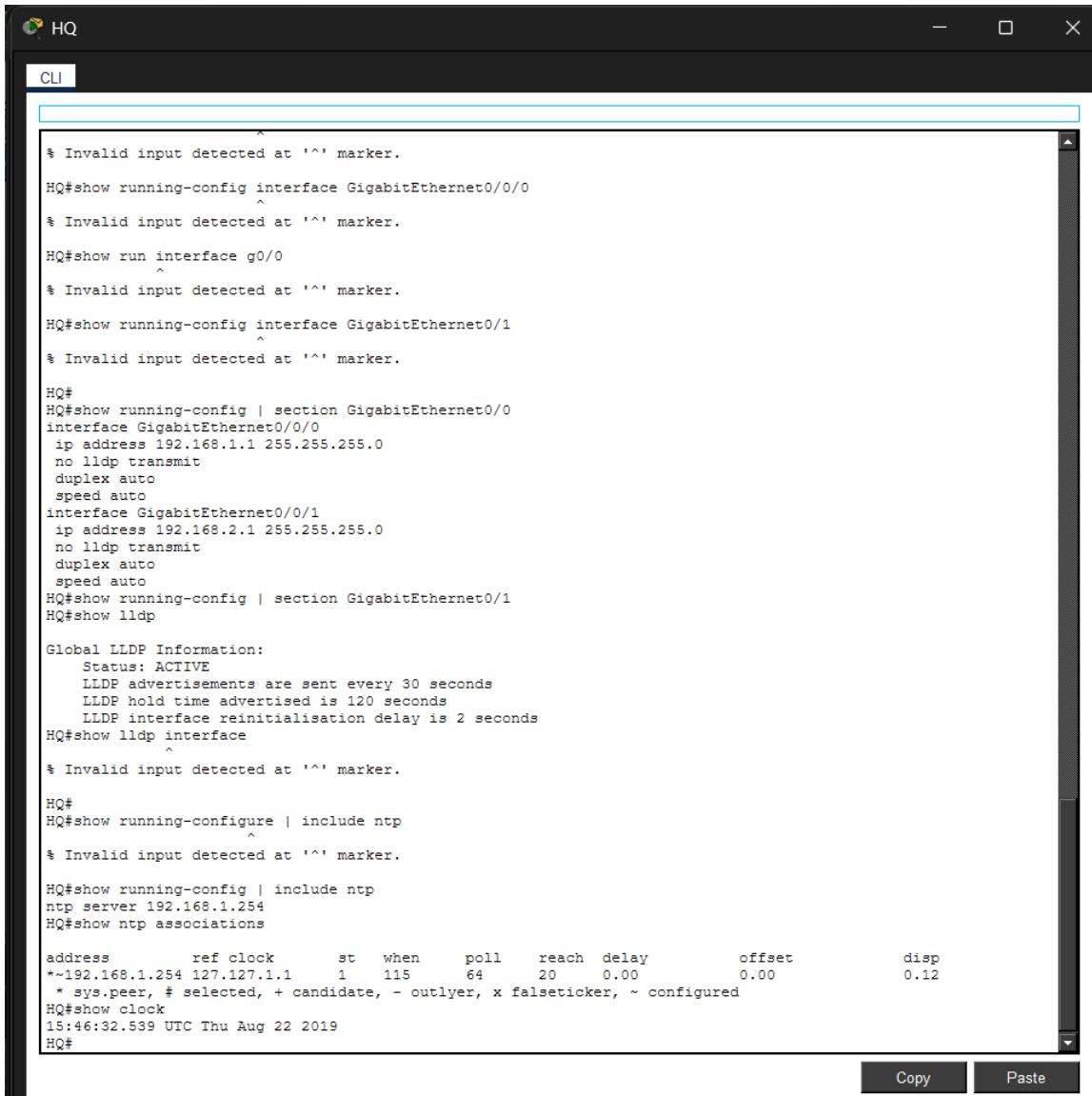
```
HQ-SW-2 con0 is now available

Press RETURN to get started.

HQ-SW-2>enable
HQ-SW-2#show run | include cdp
no cdp run
HQ-SW-2#show run | include lldp
lldp run
no lldp receive
no lldp transmit
--More--
```

At the bottom right of the terminal window are two buttons: "Copy" and "Paste".

Figure 3: HQ Router - LLDP Global Status and Interface Direction Control



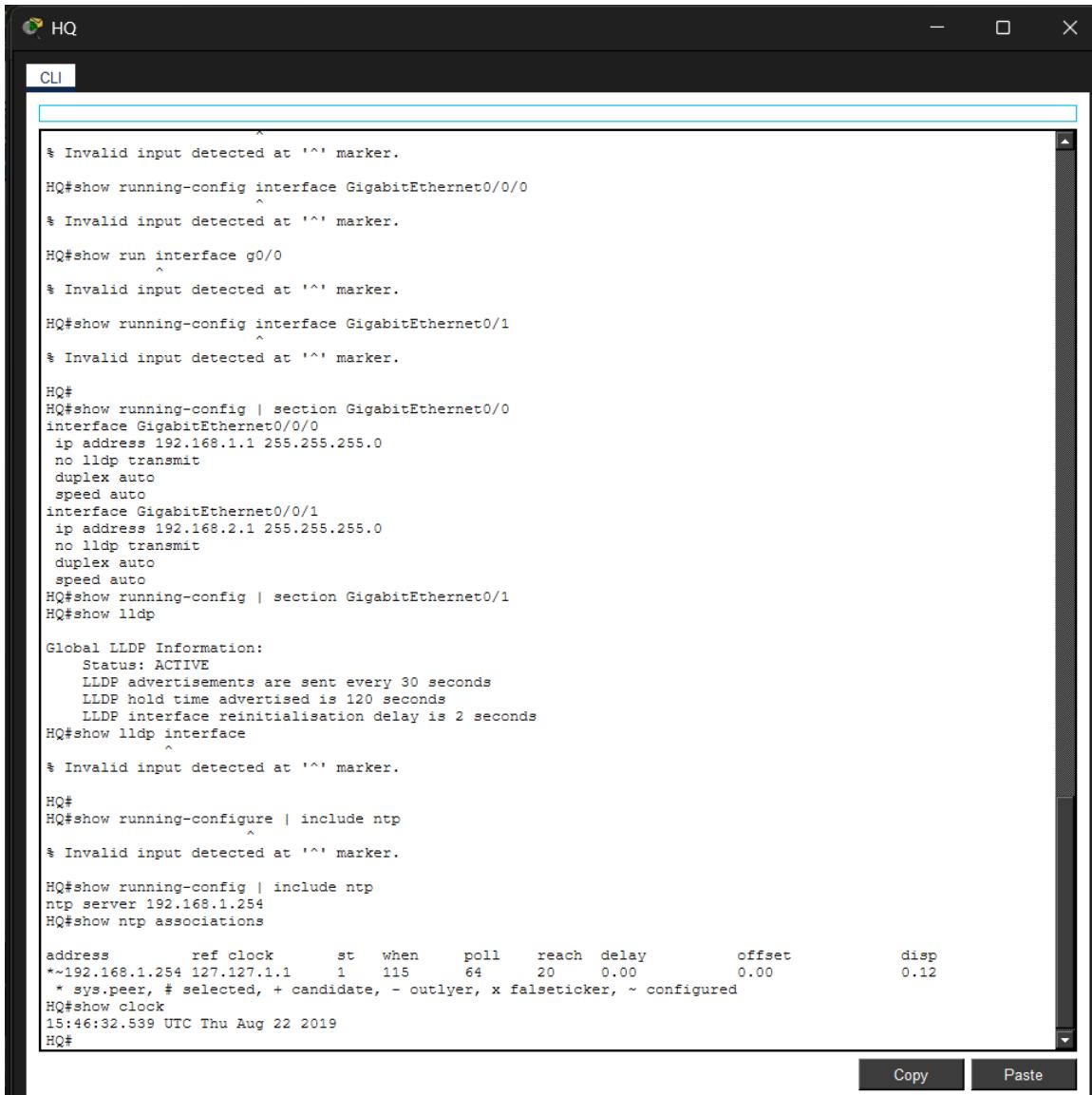
The screenshot shows a Windows-style application window titled "HQ" with a "CLI" tab selected. The main pane displays a command-line interface session. The user has entered several commands related to LLDP and NTP configuration. The session output includes error messages for invalid input, configuration details for GigabitEthernet interfaces, and NTP associations. At the bottom right of the CLI window, there are "Copy" and "Paste" buttons.

```
% Invalid input detected at '^' marker.  
HQ#show running-config interface GigabitEthernet0/0/0  
^  
% Invalid input detected at '^' marker.  
HQ#show run interface g0/0  
^  
% Invalid input detected at '^' marker.  
HQ#show running-config interface GigabitEthernet0/1  
^  
% Invalid input detected at '^' marker.  
  
HQ#  
HQ#show running-config | section GigabitEthernet0/0  
interface GigabitEthernet0/0/0  
ip address 192.168.1.1 255.255.255.0  
no lldp transmit  
duplex auto  
speed auto  
interface GigabitEthernet0/0/1  
ip address 192.168.2.1 255.255.255.0  
no lldp transmit  
duplex auto  
speed auto  
HQ#show running-config | section GigabitEthernet0/1  
HQ#show lldp  
  
Global LLDP Information:  
  Status: ACTIVE  
    LLDP advertisements are sent every 30 seconds  
    LLDP hold time advertised is 120 seconds  
    LLDP interface reinitialisation delay is 2 seconds  
HQ#show lldp interface  
^  
% Invalid input detected at '^' marker.  
  
HQ#  
HQ#show running-configure | include ntp  
^  
% Invalid input detected at '^' marker.  
  
HQ#show running-config | include ntp  
ntp server 192.168.1.254  
HQ#show ntp associations  
  
address      ref clock      st      when      poll      reach      delay          offset          disp  
**192.168.1.254 127.127.1.1      1      115      64      20      0.00          0.00          0.12  
* sys.peer, # selected, + candidate, - outlyer, x falseticker, ~ configured  
HQ#show clock  
15:46:32.539 UTC Thu Aug 22 2019  
HQ#
```

#### 4. NTP Configuration and Verification

The HQ router was configured to use the NTP server at 192.168.1.254. Verification confirms NTP associations and synchronization. This ensures accurate logging, consistent timestamps, and cross-device event correlation.

Figure 4: HQ Router - NTP Configuration and Sync Verification



```
% Invalid input detected at '^' marker.

HQ#show running-config interface GigabitEthernet0/0/0
^
% Invalid input detected at '^' marker.

HQ#show run interface g0/0
^
% Invalid input detected at '^' marker.

HQ#show running-config interface GigabitEthernet0/1
^
% Invalid input detected at '^' marker.

HQ#
HQ#show running-config | section GigabitEthernet0/0
interface GigabitEthernet0/0/0
ip address 192.168.1.1 255.255.255.0
no lldp transmit
duplex auto
speed auto
interface GigabitEthernet0/0/1
ip address 192.168.2.1 255.255.255.0
no lldp transmit
duplex auto
speed auto
HQ#show running-config | section GigabitEthernet0/1
HQ#show lldp

Global LLDP Information:
  Status: ACTIVE
    LLDP advertisements are sent every 30 seconds
    LLDP hold time advertised is 120 seconds
    LLDP interface reinitialisation delay is 2 seconds
HQ#show lldp interface
^
% Invalid input detected at '^' marker.

HQ#
HQ#show running-configure | include ntp
^
% Invalid input detected at '^' marker.

HQ#show running-config | include ntp
ntp server 192.168.1.254
HQ#show ntp associations

address      ref clock      st      when      poll      reach      delay          offset          disp
**192.168.1.254 127.127.1.1      1     115      64      20      0.00      0.00      0.12
 * sys.peer, # selected, + candidate, - outlyer, x falseticker, ~ configured
HQ#show clock
15:46:32.539 UTC Thu Aug 22 2019
HQ#
```

Copy      Paste

## 5. Conclusion

The lab objectives were successfully completed. CDP was selectively enabled on Branch and disabled on HQ in alignment with network security standards. LLDP was deployed on HQ routers and switches with controlled sending and receiving directions to prevent unnecessary discovery traffic. NTP synchronization was properly configured, validated, and fully operational. The network is now prepared with secure discovery mechanisms and accurate time services as required for network monitoring, troubleshooting, and log correlation.