Medium shot of a person holding a tablet

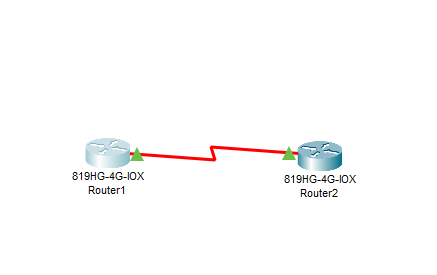
AI-generated content may be incorrect.CHAP Authentication Variation 1

Ronique Young

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Project Summary: Configuring and Verifying a PPP Link with CHAP Authentication between R1 and R2

In this project, I successfully configured two Cisco routers, R1 and R2, to establish a serial link using Point-to-Point Protocol (PPP) encapsulation with Challenge Handshake Authentication Protocol (CHAP) authentication. The tasks involved setting up hostnames, enabling serial interfaces with proper clocking, assigning IP addresses, enabling PPP, and verifying connectivity and authentication. Below is a detailed account of the steps I completed.



Task 1: Configure Hostnames on R1 and R2

I began by configuring the hostnames on both routers as specified in the topology. On R1, I set the hostname to "R1," and on R2, I set it to "R2." This was accomplished using the following commands:

- On R1: `hostname R1`

- On R2: `hostname R2`

This ensured that each router was uniquely identified for the remainder of the configuration and authentication processes.

Task 2: Enable Serial Interfaces and Configure Clocking

Next, I enabled the Serial0 interfaces on both R1 and R2. The topology indicated that R2’s Serial0 interface was the Data Communications Equipment (DCE) side of the link. To confirm this, I used the command `show controllers serial0/0` on R2, which displayed output confirming it as the DCE (e.g., "DCE V.35"). On R2, I configured the DCE interface to provide clocking to R1 at a speed of 800 Kbps with the command:

- `clock rate 800000`

On R1, I verified that it received clocking information from R2 by running `show controllers serial0`, which indicated "DTE V.35 clocks detected," confirming successful clock synchronization. I also activated both interfaces using `no shutdown`.

Task 3: Enable PPP Encapsulation and Configure IP Addressing

I then configured PPP encapsulation on the Serial0 interfaces of both routers using the command:

- `encapsulation ppp`

Following this, I assigned IP addresses to the interfaces as per the topology

- On R1: `ip address 192.168.50.33 255.255.255.224

- On R2: `ip address 192.168.50.34 255.255.255.224

This established a point-to-point connection between the routers.

Task 4: Verify Encapsulation and Test Connectivity

To confirm that PPP encapsulation was active, I used the command `show interfaces serial0` on both routers. The output showed "Encapsulation PPP" and "Serial0 is up, line protocol is up," indicating the interfaces were operational with PPP. I tested connectivity by issuing a `ping 192.168.50.34` from R1 and `ping 192.168.50.33` from R2. Both pings were successful, verifying that the link was functioning correctly.

Task 5: Configure PPP Authentication with CHAP

I configured CHAP authentication on the Serial0/0 interfaces of R1 and R2. Both routers were set to authenticate each other using their hostnames (R1 and R2) and the password "CHAP." First, I defined the username and password pairs:

- On R1: `username R2 password CHAP`

- On R2: `username R1 password CHAP`

Then, I enabled CHAP on the interfaces with:

- `ppp chap hostname R1` (on R1) and `ppp chap hostname R2` (on R2)

- `ppp authentication chap` on both interfaces

This ensured mutual authentication using the specified credentials.

Task 6: Debug and Verify CHAP Authentication

On R2, I enabled PPP authentication debugging with the command `debug ppp authentication`. To trigger authentication events, I executed `shutdown` followed by `no shutdown` on R2’s Serial0 interface. The debug output displayed the CHAP negotiation process, including challenge and response messages, confirming that R1 and R2 successfully authenticated each other. Once verified, I disabled debugging with `undebug all` to stop the output.

Conclusion

This project demonstrated my ability to configure and troubleshoot a serial link between two Cisco routers using PPP with CHAP authentication. All tasks were completed successfully, with clocking, encapsulation, IP connectivity, and authentication functioning as intended. The verification steps ensured the link’s reliability and security.

**Click on the File to the Left to See the Breakdown**