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Introduction

This document describes the role of Challenge Handshake Authentication Protocol (CHAP) authentication configured under cellular interface. It also clarifies the logic and sequence of steps that take place at the time of initialization of cellular interface in Cisco 3G/4G routers.

Prerequisites

Requirements

Cisco recommends that you have basic knowledge of 3G and 4G.

- chat script
- cellular interface configuration
- dialer list for triggering a dial
- line configuration
- modem profile
- route for the cellular interface

Note: There are the six sections that must be configured in order to have a working cellular connection.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Configure

These are the standard cellular configurations that you should have for any 3G/4G connection.

Assume that you have two profiles here, for example:

```
Profile 1 : PROFILE-1@CISCO.COM Password CISCO123Profile 2 : PROFILE-2@CISCO.COM Password
```

CISCO1234

Cellular 0 interface configuration :

```
Router#sh run in cellular 0
Building configuration...
```

```
Current configuration : 502 bytes
!
interface Cellular0
 ip address negotiated
 encapsulation ppp
 dialer in-band
 dialer idle-timeout 0
 dialer string LTE
 dialer-group 1
 async mode interactive
 ppp chap hostname TEST-1@CISCO.COM
 ppp chap password CISCO123
end
```

Profile 1 configuration details:

Below are the profile configuration for profile 1

```
Router#show cellular 0 profile 1
Profile password Encryption level: 7
```

```
Profile 1 = ACTIVE*
-----
PDP Type = IPv4
PDP address = 10.10.10.1
Access Point Name (APN) = CISCO.COM
Authentication = CHAP
Username: PROFILE-1@CISCO.COM
Password: CISCO123
*- Default profile
```

Cellular 1 interface configuration:

```
Router#sh run in cellular 1
Building configuration...
```

```
Current configuration : 502 bytes
!
interface Cellular1
 ip address negotiated
 encapsulation ppp
 dialer in-band
 dialer idle-timeout 0
 dialer string LTE
 dialer-group 1
 async mode interactive
 ppp chap hostname TEST-2@CISCO.COM
 ppp chap password CISCO1234
end
```

Profile 2 configuration details:

Configuration for profile 2

```
Router#show cellular 0 profile 2
Profile password Encryption level: 7
```

```
Profile 2 = ACTIVE*
-----
```

```
PDP Type = IPv4
PDP address = 20.20.20.1
Access Point Name (APN) = CISCO.COM
Authentication = CHAP
Username: PROFILE-2@CISCO.COM
Password: CISCO1234
*- Default profile
```

When you activate profile 1, you get a negotiated IP address from the provider for username PROFILE-1@CISCO.COM.

Note: For authentication with provider CHAP username and password configured under cellular are not used.

Use this command to activate the second profile:

```
Router #cellular 1 lte profile create 2 PROFILE-2@CISCO.COM
```

To modify the Default Profile 1 or 2, you need to re-create the profile. You are asked twice to confirm whether you want to overwrite the profile that already exists.

How to recreate profile 1 is shown in this example:

```
Router#cellular lte profile create 1 PROFILE-1@CISCO.COM
Warning: You are attempting to modify the attach profile.
Please consult the service provider before doing so.
Modem power cycle required for change to take effect.
```

```
PDP Type = IPv4
Access Point Name (APN) =
Authentication = NONE
```

```
Profile 1 already exists with above parameters. Do you want to
overwrite? [confirm]
```

```
Profile 1 will be overwritten with the following values:
```

```
PDP type = IPv4
APN = PROFILE-1@CISCO.COM
Authentication = NONE
```

```
Are you sure? [confirm]
Profile 1 written to modem
```

For GSM, use this format:

```
cellular 0 gsm profile create <profile number> <apn> <authentication> <username> <password> ipv4
Router#cellular 0 gsm profile create 1 PROFILE-1@CISCO.com chap PROFILE-1@CISCO.COM CISCO123
ipv4
```

Verify

Use this section in order to confirm that your configuration works properly.

For 3G/4G fixed routers and modules, the encapsulation under the cellular interface is for the communication between IOS and modem. It has nothing to do with the communication or negotiation between modem and the service provider. In older modems, for communication between IOS and modem, PPP was used. In newer LTE modems, SLIP frames are used for the same purpose.

The parameters required to negotiate with service provider like authentication, username/password credentials and so on must be configured in cellular profile and not under cellular interface or dialer interface.

Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

Basic debugs for troubleshooting:

Debug dialer

Debug chat

Debug modem Debug ppp negotiation