# L3, L4, and L7 Rule Combination in Ruledef


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## Revision History

**Note** Revision history details are not provided for features introduced before release 21.24.

| Revision Details | Release |
|---|---|
| First introduced | Pre 21.24 |

## Feature Description

Using the L3, L4, and L7 Rule Combination in Ruledef feature, you can allow and categorize traffic into specific Rating Group (RG) for the following:

- Specific IP addresses
- Ports
- Uniform Resource Locators (URLs)

The feature increases the scalability of the host pool from 256 to 512. The feature allows and defines a new **url-sni-pool** configuration with 256 entries in a single pool. The entries can be a mix of URL and Server Name Indication (SNI) values. The system-wide limit of URL-SNI pools is 384 entries.

# How it Works

The feature enables you to define a list of URLs or SNIs for the **url-sni-pool** configuration. The system uses a pool of URLs or SNIs as an L7 filter within a ruledef. A ruledef can contain a combination of hostpool, portmap, and url-sni pool match. The system matches the url-sni-pool configuration along with the other rule lines criteria without occupying any of the 32 existing rule lines.

# Configuring the L3, L4, and L7 Rule Combination in Ruledef Feature

The new URL-SNI Pool Configuration mode is available under ACS Configuration mode. Use the following configuration to enable the feature.

```
configure
   active-charging service service_name
     url-sni-pool pool_name
        http url { contains | starts-with | ends-with | = | !contains |
!starts-with | !ends-with | != } url_name
        tls sni { contains | starts-with | ends-with | = | !contains |
!starts-with | !ends-with | != } sni_identity
     ruledef ruledef_name
        ip server-ip-address host_poolname
        tcp either-port port-map port_mapname
        http-tls url-sni-pool pool_name
        end
```

**Note**

- The system configures the ruledef with the default all-lines AND option or **multi-line-or-all-lines** option.
- When the **url-sni-pool** rule line is configured, the URL or SNI value is always matched regardless of the AND or OR match operation.
- When the AND operation is configured, all the other rule lines is matched in addition to the URL or SNI value in the pool.
  - The AND operation is the default configuration.
- After configuring the OR operation, the system matches the following values for the rule action to take effect:
  - Any one of the other rule lines.
  - URL or SNI

# Verifying the L3, L4, and L7 Rule Combination in Ruledef Feature Configuration

Use the following show CLI commands to verify the url-sni-pool configuration.

- On Control Plane: **show configuration active-charging service name** *service_name*

  For example, the following is a partial output of the show CLI command:

```
url-sni-pool url_pool1
         http url contains google.com
         tls sni contains gmail.com
```

- On User Plane: **show user-plane-service url-sni-pool name** *pool_name*

  For example, the following is a partial output of the show CLI command:

```
url-sni-pool url_pool1
         http url contains google.com
         tls sni contains gmail.com

Total url-pool(s) found: 1
```

# Monitoring and Troubleshooting

## Show commands and Outputs

This section provides information about the show CLI commands available in support of the feature.

### show configuration active-charging service name <service_name>

Use this CLI command in Control Plane to display the url-sni-pool attachment to the ruledef.

The following is a partial sample output:

```
ruledef special_charging_group1
      ip server-ip-address range host-pool IP_FREE_MUSIC
      tcp either-port range port-map PORT_FREE_MUSIC
      http-tls url-sni-pool url_pool1
```

### show user-plane-service ruledef name <ruledef_name>

Use this show CLI command in User Plane to display the url-sni-pool attachment to the ruledef.

The following is a partial sample output:

```
Ruledef Name: special_charging_group1
    ip server-ip-address range host-pool IP_FREE_MUSIC
    tcp either-port range port-map PORT_FREE_MUSIC
    Rule Application Type: Charging
    Copy Packet to Log: Disabled
    Tethered Flow Check: Disabled
    Attached Url-Sni-Pool: url_pool1
    Multi-line OR: Disabled
```