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Subscriber Activity Monitoring

FastDPI provides two mechanisms for monitoring subscriber activity based on outgoing traffic from the subscriber to the internet:

- Monitoring subscriber activity and blocking incoming traffic without terminating the session. This is a reactive control, performed "after the fact," i.e., when a packet arrives from the internet to the subscriber. If there is no traffic from the internet to the subscriber, there is no control; ARP ping is used to check subscriber activity. This method limits incoming traffic to the subscriber in case of inactivity without terminating the subscriber session.
- Monitoring subscriber activity with session termination (Subscriber Host Connectivity Verification) complements this control with active monitoring of open DHCP sessions and terminates the subscriber session in case of inactivity.

Both algorithms are compatible and can work together.

The activity monitoring mechanisms described here are not applied to PPPoE subscribers. PPPoE contains built-in standard mechanisms for activity checking and session termination due to inactivity.

Monitoring Subscriber Activity and Blocking Incoming Traffic Without Terminating the Session

Subscriber activity monitoring is an L2 BRAS function that blocks traffic from the internet to the subscriber if the subscriber shows no activity (no traffic from the subscriber to the internet). During its operation, L2 BRAS records the time T of the last packet received from the subscriber. Within the T + `bras_subs_activity_timeout` activity interval, the subscriber is considered active and all packets from the internet to the subscriber are allowed. If the subscriber becomes inactive, meaning the activity interval has been exceeded since the last packet **from** the subscriber, L2 BRAS drops the incoming traffic.

Additionally, the `bras_subs_activity_ping_timeout` function can be set to ping the subscriber if they become inactive. The ping is performed by sending a unicast ARP request to the subscriber: if a response to the ARP unicast request is received, it updates the last packet reception time from the subscriber, thus considering the subscriber active.

Activity monitoring only works on outgoing subscriber traffic (from the subscriber to the internet). This control can be particularly relevant for subscribers with a static public address.

Configuration

Subscriber activity monitoring is configured with the following parameters in `fastdpi.conf`:

- `bras_subs_activity_timeout` — sets the activity interval in seconds. 0 (default) — disables activity monitoring.
- `bras_subs_activity_ping_timeout` — timeout in seconds for pinging the subscriber with an ARP request. 0 (default) — disables ARP pinging of the subscriber. If the subscriber is inactive, unicast ARP requests will be sent to them every `bras_subs_activity_ping_timeout` seconds.

Monitoring Subscriber Activity with Session Termination (Subscriber Host Connectivity Verification)

SHCV (Subscriber Host Connectivity Verification) monitors the activity of DHCP subscribers similarly to Nokia by proactively monitoring the state of the subscriber's DHCP session. If there is no traffic from the subscriber to the internet within `bras_dhcp_shcv_interval` seconds, fastDPI starts pinging the subscriber by sending unicast ARP requests on behalf of the subscriber's gateway. The ARP request response wait time is `bras_dhcp_shcv_retry_timeout` seconds. If no response is received to `bras_dhcp_shcv_retry_count` consecutive ARP requests or the ARP response contains a different MAC, the subscriber is considered inactive, and their DHCP session is terminated. Terminating the DHCP session is similar to CoA Disconnect — actions are taken according to the `bras_dhcp_disconnect` option. The accounting session is closed with the `Acct-Terminate-Cause=4` (Idle timeout) flag, and the VSA `VasExperts-Acct-Terminate-Cause` is set to the new value 20 "Disconnected due to inactivity." SHCV is implemented based on the active sessions monitoring API (`ip_db` grooming).

Configuration

- `bras_dhcp_shcv_interval` — inactivity interval, in seconds;
  0 — SHCV is disabled (default).
- `bras_dhcp_shcv_retry_timeout` — ARP request response wait time, in seconds
  Default = 3 seconds.
- `bras_dhcp_shcv_retry_count` — number of ARP requests without response.
  Default = 3 requests.