

NetLoc for WiFi EPC

This chapter describes StarOS support for the NetLoc for WiFi EPC feature on the P-GW and SAE-GW.

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Feature Description

With this feature, the IMS network can retrieve location information of the UE from WLAN access network. This improves location related feature and functionality for the operator. This feature also helps in charging subscribers based on location information.

Please note that the support for LTE NetLoc already exists from prior releases. With this release, NetLoc support is extended for WLAN access. Basic implementation is already supported for passing necessary parameter to different internal modules like SM, IMSA and ECS.

How It Works

When the Application Function (AF) requests the PCRF to report the access network information, the PCRF provides the requested access network information indication (for example, user location and/or user timezone information) to the PCEF within the Required-Access-Info AVP which is included in the Charging-Rule-Definition AVP of an appropriate PCC rule.

The PCRF also provides the ACCESS_NETWORK_INFO_REPORT event trigger within the Event-Trigger AVP. If the ACCESS_NETWORK_INFO_REPORT event trigger is set, upon installation, modification and removal of any PCC rule(s) containing the Required-Access-Info AVP, the P-GW determines if it can obtain the required location information for the used IP CAN type.

During bearer deactivation or UE detach procedure, the P-GW provides the access network information to the PCRF within the TWAN-Identifier AVP. The P-GW also provides information on when the UE was last known to be in that location within the User-Location-Info-Time AVP, and/or UE-Local-IP-Address AVP as applicable for S2a/S2b interface:

- For Trusted WLAN, the User Location Information (ULI) is provided in the TWAN Identifier AVP.

- For Untrusted WLAN, the ULI contains the TWAN Identifier, the UE's Local IP address and optionally, UDP source port number (if NAT is detected).

When the ULI is requested by the PCRF and it's not provided to the PCEF, the PCEF provides the serving PLMN identifier within the 3GPP-SGSN-MCC-MNC AVP. And when the time zone is requested by the PCRF, the PCEF provides it within the 3GPP-MS-TimeZone AVP. Please note that the timezone is applicable only for Trusted WLAN interface. For WLAN access, the PCEF also includes the AN-Trusted AVP while reporting access network information.

During the IP-CAN session termination procedure, the PCEF will, if ACCESS_NETWORK_INFO_REPORT event trigger is set, provide the access network information to the PCRF by including the ULI (if it was provided to the PCEF), the information on when the UE was last known to be in that location within User-Location-Info-Time AVP (if it was provided to the PCEF), the PLMN identifier within the 3GPP-SGSN-MCC-MNC AVP (if the user location information was not provided to the PCEF) and the timezone information within the 3GPP-MS-TimeZone AVP.

The WLAN location information received from S2a/S2b interface is reported on all the P-GW supported interfaces (Gx, Gy, and Gz).

Accounting Requirements

As part of accounting requirements, the following Dictionaries are used:

- Gx: r8-gx-standard
- Gy:
  - S2a: custom-8 with Rel-11
  - S2b: custom-8 with Rel-13
- Gx:
  - S2a: custom-48 and custom-52
  - S2b: custom-52

The following fields in PGW-CDRs are introduced as part of Gz requirement:

- custom-52 dictionary (as part of uWANUserLocationInfo):
  - uELocalIPAddress
  - uDPSourcePort
  - sSID
  - bSSID

The custom-52 is a new standard dictionary introduced in compliance with 3GPP Release 13.

Limitations

This section identifies the known limitations/restrictions of this feature.

- The User Location Information (ULI) on S2b includes UE local IP address and optionally, UDP source port number (if NAT is detected). It also includes WLAN Location Information (and its age). Location change is considered if any of the following information changes: UE local IP address, UDP port, or WLAN Location.
- On Gz, for WLAN location change, the ULI change trigger is used.
- On Gy, for WLAN location change, the location_any trigger is used.
- The Rf and S2a RADIUS, and LI interfaces are not considered as part of this feature.
- There are no changes done over S6b interface.
- Only SSID and BSSID of TWAN/UWAN Identifier are considered as part of this feature.
- UE local IP address field is mandatory on Gz and Gy as part of UWANUserLocationInfo.
- For S2b, when the received UWANUserLocationInfo is different than the previous UWANUserLocationInfo, then below are few error case handling:
  - For Gy, if the received parameters doesn't contain IP Address, the P-GW doesn’t generate a ULI-Change report.
  - For Gz, the container with 'ULI change' is closed only when the UWANUserLocationInfo value corresponding to the container contains the IP-Address.
- This feature is controlled by NetLoc and Wifi Integration License.
- In case of S2b interface, UE Local IP Address and Port, WLAN ID and WLAN Timestamp are reset to 0 if they are not received in CSReq/CBRsp/UBRsp/DBRsp.
- As per 3GPP TS 32.298, TWAN Identifier is present at Record level in Gz.
- The WLAN-timestamp is not sent over Gy and Gz interface.
- The UE-location-IP-Address change event trigger is not part of this feature.
- The EPC_Routed Feature (Reference 3GPP TS 29.212) is not supported.

Configuring the NetLoc for WiFi EPC Feature

The following sections provide the configuration commands to enable the feature.

Configuring the NetLoc TWAN for Gx

The commands illustrated below configures the NetLoc trusted WLAN feature over Gx interface.

```
configure
  context context_name
    ims-auth-service service_name
      policy-control
        diameter encode-supported-features netloc-trusted-wlan
        end
```

Notes:

- **no diameter encode-supported-features**: Disables the feature.
- This command takes effect when Gx is enabled on S2b call.
- By default, the feature is disabled and TWAN information will not be sent over Gx.

Configuring the NetLoc UWAN for Gx

The commands illustrated below configures the NetLoc untrusted WLAN feature over Gx interface.

```
configure
  context context_name
    ims-auth-service service_name
      policy-control
        diameter encode-supported-features netloc-untrusted-wlan
        end
```

Notes:

- **no diameter encode-supported-features**: Disables the feature.
- This command takes effect when Gx is enabled on S2b call.
- By default, the feature is disabled and UWAN information will not be sent over Gx.

Configuring the NetLoc UWAN for Gy

The commands illustrated below configures dictionary control of the AVPs that need to be added based on 3GPP Rel.13.

```
active-charging service service_name
  credit-control
    diameter update-dictionary-avps 3gpp-rel13
    end
```

Notes:

- **no diameter update-dictionary-avps**: Disables the feature.
- This command takes effect when Gy is enabled on S2b call.
- By default, the feature is disabled and UWAN information will not be sent over Gy.

Configuring the NetLoc UWAN for Gz

The commands illustrated below configures the NetLoc untrusted WLAN feature over Gz interface.

```
configure
  context context_name
    gtpp group group_name
      gtpp attribute uwanuli
      end
```

Notes:

- **no gtpp attribute uwanuli**: Disables the feature.
- This command takes effect when Gz is enabled on S2b call.
- By default, the feature is disabled and UWAN information will not be sent over Gz.

Monitoring and Troubleshooting the NetLoc for WiFi EPC Feature

This section provides information regarding show commands and/or their outputs in support of this feature.

Show Commands and/or Outputs

The following table lists the CLI commands that will help to monitor and/or troubleshoot this feature.

CLI Commands	Description

show subscribers pgw-only full all
show subscriber saegw-only full all
	Displays the following newly introduced fields for which the values will be populated on S2a/S2b calls:
	`TWAN User Location Information:`
	`SSID:`
	`BSSID:`
	`UWAN User Location Information:`
	`UE Local IP Address:`
	`UDP Port:`
	`SSID:`
	`BSSID:`

show ims-authorization service all verbose	Displays the following newly introduced fields for which the values will be populated when they are configured as Supported Features AVP in IMS Authorization Service Configuration mode: • **netloc-trusted-wlan** • **netloc-untrusted-wlan**
show gtpp group all	Displays the following newly introduced field for which the value will be populated when the **gtpp attribute uwanuli** CLI command is configured in the GTPP Server Group configuration mode: • **UWAN User Location Information present:**