

5GS Interworking Suppression Control

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5GSIWKI suppression control

5GSIWKI Suppression Control is a mechanism that allows the cnSGWc to manage the forwarding of the 5GS Interworking Indication (5GSIWKI) flag, which is received from the Mobility Management Entity (MME) during session establishment. This control enables operators to customize how the 5GSIWKI flag is handled and forwarded, enhancing flexibility for interworking scenarios between 4G and 5G networks.

The suppression control feature is a configurable through the command-line interface (CLI). The control mechanism applies logic based on the subscriber's status—whether the subscriber is a home user or a roamer.

When a User Equipment (UE) that supports 5G interworking initiates a session, the MME includes the 5GSIWKI flag in the Create Session Request. The cnSGWc uses the suppression control configuration to decide whether to forward or suppress this flag towards the S5/S8 interface, depending on the subscriber type.

How 5GSIWKI suppression works

Summary

The cnSGWc processes and forwards the 5GSIWKI flag received from the MME based on the configured **ignore-5g-iwk setting** within the subscriber's assigned call-control-profile.

The key components involved in the process are:

- User Equipment (UE): Initiates a session that may support 5G interworking.
- Mobility Management Entity (MME): Includes the 5GS Interworking Indication (5GSIWKI) flag in the Create Session Request.
- Cloud Native Serving Gateway (cnSGW): Receives the Create Session Request and applies suppression logic.

- Session Management Function (SMF)/Packet Gateway (P-GW): Receives the forwarded Create Session Request with the modified 5GSIWKI flag.
- Call-control-profile: A configuration profile that determines the `ignore-5g-iwk` setting for a subscriber.

Workflow

The process involves the following stages:

1. A User Equipment (UE) that supports 5G interworking initiates a session.
2. The MME includes the 5GS Interworking Indication (5GSIWKI) flag as "true" in the Create Session Request and sends it to the cnSGW.
3. The cnSGWc receives the Create Session Request.
4. The cnSGWc identifies the call-control-profile assigned to the subscriber.
5. The cnSGWc checks the ignore-5g-iwk setting within the identified call-control-profile.
   - If `ignore-5g-iwk` is set to `true` (typically for home subscribers), the cnSGWc transmits the 5GSIWKI as `False` towards the S5/S8 interface, regardless of the received value.
   - If `ignore-5g-iwk` is set to `false` (typically for inbound roaming subscribers or default behavior), the cnSGWc forwards the 5GSIWKI as `True` towards the S5/S8 interface if it was received as `True` from the MME.
6. The SMF/PGW receives the Create Session Request with the potentially modified 5GSIWKI flag.

Result

The 5GSIWKI flag is handled according to the operator's policy, allowing for differentiated behavior for home and roaming subscribers. After a system upgrade, the default behavior conforms to the 3GPP specification, where no suppression logic applies, and the 5GSIWKI Indication IE is forwarded as `True` if received as `True`.

Configure 5GSIWKI suppression

To control whether the cnSGWc suppresses the 5GS Interworking Indication (5GSIWKI) flag when forwarding it to the SMF/P-GW.

This configuration allows operators to differentiate 5GSIWKI handling for home and roaming subscribers based on their assigned call-control-profile. The new CLI configuration applies exclusively to new call sessions initiated after the configuration is applied.

Before you begin

Follow these steps to configure 5GSIWKI suppression:

Procedure

Step 1 Create or enter an existing policy call-control-profile in the global configuration mode.

Example:

```
policy call-control-profile profile_name
```

Replace *profile_name* with the desired name for your call control profile (for example, `cc_home`, `cc_roam`).

Step 2 Configure the ignore-5g-iwk setting:

Example:

```
ignore-5g-iwk { false | true }
```

Use **true** to suppress sending the 5GS Interworking Indication towards the S5/S8 interface.

Use **false** to forward the 5GS Interworking Indication as received from the MME. The default value is **false**.

Step 3 Exit the call-control-profile configuration mode and global configuration mode.

Step 4 (Optional): To verify the configuration, use the following show running-config command:

Example:

```
[sgw] smf# show running-config
policy call-control-profile ccp1
  charging-mode           none
  sgw-charging-profile ch1
  ignore-5g-iwk           true
exit
```

The cnSGWc applies the configured 5GSIWKI suppression behavior to new call sessions associated with the specified call-control-profile.

Monitoring Subscriber Information

The `show subscriber` command has been enhanced to display the `call-control-profile` used by a subscriber. This helps in verifying which profile is applied to a specific subscriber session.

Sample `show subscriber` Output:

```
[sgw] smf# show subscriber nf-service sgw imsi 123456789012348 gr-instance 1
{
  "subResponses": [
    {
      "status": true,
      "genericInfo": {
        "imsi": "imsi-123456789012348",
        "mei": "imei-123456786666660",
        "msisdn": "msisdn-223310101010101",
        "accessType": "EUTRAN",
        "plmnId": {
          "mcc": "123",
          "mnc": "456"
        },
        "sgwProfileName": "sgw1",
        "unAuthenticatedImsi": "No",
        "subscriberType": "NonVolte"
      },
      "s11cInterfaceInfo": {
        "sgwTeid": "[0x11000a80] 285215360",
        "sgwIPv4Address": "209.165.201.1",
        "mmeTeid": "[0x54e] 1358",
        "mmeIPv4Address": "209.165.201.2"
      },
      "pdnInfoList": {
        "totalPdn": 1,
        "pdnInfo": [
```

```
{
  "pdnId": "PDN-1",
  "apn": "intershat",
  "attachType": "Initial Attach",
  "sgwRelocState": "N/A",
  "operatorPolicyName": "opPol1",
  "dnnProfileName": "intershat",
  "defaultEbi": 5,
  "pdnType": "IPv4",
  "allocatedIPv4": "209.165.201.3",
  "apnSelectionMode": "Subscribed",
  "ambrUplink": "10 Kbps",
  "ambrDownlink": "20 Kbps",
  "s5cInterfaceInfo": {
    "sgwTeid": "[0x51000a80] 1358957184",
    "sgwIPv4Address": "209.165.201.1",
    "pgwTeid": "[0x3ea] 1002",
    "pgwIPv4Address": "209.165.201.4"
  },
  "sxaInterfaceInfo": {
    "selectedUP": "209.165.200.225",
    "upEpKey": "209.165.201.2:209.165.200.233",
    "cpSeid": "[0x11000a8051000a80] 1224990644875823744",
    "upSeid": "[0x3e9] 1001"
  },
  "bearerInfoList": {
    "totalBearer": 1,
    "bearerInfo": [
      {
        "bearerId": "Bearer-1",
        "state": "Connected",
        "ebi": 5,
        "isDefaultBearer": true,
        "qosInfo": {
          "qci": 6,
          "arp": 113
        },
        "s1uInterfaceInfo": {
          "sgwTeid": "[0x550] 1360",
          "sgwIPv4Address": "209.165.200.238",
          "eNodeBTeid": "[0x551] 1361",
          "eNodeBIPv4Address": "209.165.200.239"
        },
        "s5uInterfaceInfo": {
          "sgwTeid": "[0x54f] 1359",
          "sgwIPv4Address": "209.165.201.10",
          "pgwTeid": "[0x3eb] 1003",
          "pgwIPv4Address": "209.165.201.12"
        },
        "chargingId": 303174163
      }
    ]
  },
  "uli": {
    "mcc": "123",
    "mnc": "456",
    "tac": "0x92a",
    "eci": "0x12d687"
  },
  "uetimeZone": {
    "timeZone": "+0:15",
    "dayLightSavingTime": "+1 hour"
  },
  "plmnType": "VISITOR",
```

```
            "collocatedSub": "NonCollocated",
            "dataTunnelType": "IPV4",
            "ipSrcViolation": "N/A",
            "callControlProfileName": "ccp1"
          }
        ]
      }
    }
  ]
}
```