



## Secondary RAT Usage Report in CDR Records

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### Feature Summary and Revision History

#### Summary Data

Applicable Product(s) or Functional Area	<ul style="list-style-type: none"> <li>• P-GW</li> <li>• SAEGW</li> <li>• S-GW</li> </ul>
Applicable Platform(s)	<ul style="list-style-type: none"> <li>• ASR 5500</li> <li>• VPC-DI</li> </ul>
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	<ul style="list-style-type: none"> <li>• <i>Command Line Interface Reference</i></li> <li>• <i>GTPP Interface Administration and Reference</i></li> <li>• <i>P-GW Administration Guide</i></li> <li>• <i>SAEGW Administration Guide</i></li> <li>• <i>S-GW Administration Guide</i></li> <li>• <i>Statistics and Counters Reference</i></li> </ul>

**Revision History**

Revision Details	Release
P-GW and S-GW supports secondary RAT usage reports and CDRs processing through GTPP Group Configuration CLIs.	21.20.31

## Feature Description

Reporting issues pertaining to 5G **RANSecondaryRATUsageReport** occur due to lack of:

- Control in identifying whether the **RANSecondaryRATUsageReport** must be processed in CDRs or not. This allows the S-GW, P-GW, and SAEGW to either include these reports in the SGW-CDR or PGW- CDR or to simply ignore them.
- Number of available reports inside a CDR, if the control is active.
- Control in identifying whether Zero-volume reports must make it inside the CDR or not.

This results in billing loss of data. To overcome these reporting issues, you can trigger CLI controls using GTPP group configuration to:

- Allow the S-GW, P-GW, and SAEGW to either include the RANSecondary RAT Usage reports in the SGW-CDR or PGW-CDR or to simply ignore them.
- Identify the number of secondary RAT usage reports available inside the SGW-CDR or the PGW- CDR.




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**Note** This limit must be in accordance with the system capability and ensure to consider the File-Format of the CDRs. If the configured limit exceeds, the system closes the SGW-CDR or PGW-CDR with the appropriate change-condition. For example, **max-change-condition** CDR is reused for further reports.

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- Add or ignore Zero-volume reports inside the CDR.
- The CLI **gtp limit-secondary-rat-usage** or hardcoded limit will be removed and the CLI **gtp limit-secondary-rat-usage** is reused to control the number of records within the range 1-100.
- Provides logging when the CDR size reaches the maximum size. Through PGW-CDR counter, you can monitor the number of occurrences when the CDR exceeds its size limit.

## Behavior Matrix

The following table explains the new behavior of P-GW and S-GW for this feature.

CLI	P-GW New Behavior	S-GW New Behavior
<p><b>gtp attribute secondary-rat-usage</b></p> <p>By default, this CLI command is enabled in gtp group.</p>	P-GW sends secondary RAT usage records in CDR including zero volume records.	S-GW sends secondary RAT usage records in CDR including zero volume records.
<p><b>[ no ] gtp attribute secondary-rat-usage</b></p>	P-GW does not send secondary RAT usage records in CDR.	S-GW does not send secondary RAT usage records in CDR.
<p><b>gtp suppress-secondary-rat-usage zero-volume</b></p> <p>By default, this CLI command is disabled in gtp group.</p>	P-GW does not include and send zero volume secondary RAT records in CDR. P-GW sends only secondary RAT records with non-zero volumes.	S-GW does not include and send zero volume secondary RAT records in CDR. S-GW sends only secondary RAT records with non-zero volumes.
<p><b>[ no ] gtp suppress-secondary-rat-usage zero-volume</b></p>	P-GW sends secondary RAT usage records including zero volume records in CDR.	S-GW sends secondary RAT usage records including zero volume records in CDR.
<p><b>gtp limit-secondary-rat-usage range_1-100</b>. If not configured, the default value is 32. By default, this CLI command is enabled in gtp group.</p> <p><b>Example: gtp limit-secondary-rat-usage 32</b></p> <p><b>Note</b> This CLI is the modification of the existing CLI command <b>gtp limit-secondary-rat-usage</b> with range between 1- 100.</p>	<p>P-GW generates CDR immediately when total received secondary RAT records exceeds 32 and reported cause value is <i>maximum change condition</i>.</p> <p>P-GW generates multiple CDRs if total received secondary RAT records are multiples of 32.</p> <p><b>Example:</b> If P-GW receives 100 RAT records between two triggers, P-GW generates 3 CDRs and keeps the remaining 4 RAT records for the next CDR trigger.</p>	<p>S-GW generates CDR immediately when total received secondary RAT records exceeds 32 and the reported cause value is <i>maximum change condition</i>.</p> <p>S-GW generates multiple CDRs if the total received secondary RAT records are multiples of 32.</p> <p><b>Example:</b> If S-GW receives 100 RAT records between two triggers, S-GW generates 3 CDRs and keeps the remaining 4 RAT records for the next CDR trigger.</p>
<p><b>Example:gtp limit-secondary-rat-usage 40</b></p>	<p>P-GW generates CDR immediately when total received secondary RAT records exceeds 40 and cause value is <i>maximum change condition</i>.</p> <p>P-GW generates multiple CDRs if total received secondary RAT records are multiples of 40.</p> <p><b>Example:</b> If P-GW receives 100 RAT records between two triggers, it will generate 2 CDRs and will keep remaining 20 RAT records for the next CDR trigger.</p>	<p>If the configured value is greater than 32 and sends 32 secondary RAT records in every CDR, Ignores <b>gtp limit-secondary-rat-usage 40</b> CLI command.</p>

CLI	P-GW New Behavior	S-GW New Behavior
<b>Example:gtpp limit-secondary-rat-usage 20</b>	<p>P-GW generates CDR immediately when total received secondary RAT records exceed 20 and cause value is <i>maximum change condition</i>.</p> <p>P-GW generates multiple CDRs if total received secondary RAT records are multiples of 20.</p> <p><b>Example:</b> If P-GW receives 100 RAT records between two triggers, P-GW generates 2 CDRs and will store the remaining 20 RAT records for the next CDR trigger.</p>	<p>S-GW generates CDR immediately when the total received secondary RAT records exceeds 20 and cause value is <i>maximum change condition</i>.</p> <p>S-GW generates multiple CDRs if total received secondary RAT records are in multiples of 20.</p> <p><b>Example:</b> If S-GW receives 100 RAT records between two triggers, it will generate 5 CDRs.</p>
<b>[ no ] gtpp limit-secondary-rat-usage</b>	<p>Generates CDR immediately when the total received secondary RAT records exceed 255 and cause value is <i>maximum change condition</i>.</p> <p>Generates multiple CDRs if the total received secondary RAT records are multiples of 255.</p> <p><b>Example:</b> If 1000 RAT records between two triggers are received, then 3 CDRs are generated. The remaining 235 RAT records are stored for the next CDR trigger.</p>	<p>Ignores the <b>[ no ] gtpp limit-secondary-rat-usage</b> CLI and sends 32 secondary RAT records in every CDR.</p> <p>Behavior is similar to the <b>gtpp limit-secondary-rat-usage 32</b> CLI implementation.</p> <p>Counter and debug logs are not required as it will never exceed the CDR size of 64k.</p>
	Service-specific unit limit is sent in the <b>serviceConditionChange</b> file.	Record Closure

## Relationship to Other Features

- Sessmgr Restart While Processing Secondary RAT Usage CDR Records in the *P-GW Administration Guide*.
- Secondary RAT Usage IE during GnGp handover, S-GW, and P-GW support of Secondary RAT Data Usage Report in Gz CDRs, see the *5G Non-Standalone* chapter in the *P-GW Administration Guide*.
- P-GW support of Secondary RAT Data Usage Report in Rf CDRs, see the *5G Non-Standalone* chapter in the *P-GW Administration Guide*.

## Limitations

This feature has the following limitations:

- S-GW allows a maximum number of 16 secondary RAT records per bearer during session recovery and checkpointing.
- P-GW allows a maximum number of 142 secondary RAT records across all bearers during session recovery and checkpointing.
- Anything beyond these numbers gets lost during session recovery.

## Configuring Secondary RAT Usage Report through GTPP

Use the following GTPP configurations to close Secondary RAT Usage CDR records before exceeding a buffer size.

### Enabling or Disabling the Secondary RAT Usage Report

Use the following configuration to enable or disable secondary RAT Usage report.

```

configure
  context context_name
    gtp group group_name
      gtp attribute secondary-rat-usage
    default gtp attribute secondary-rat-usage
    no gtp attribute secondary-rat-usage
  end

```

#### NOTES:

- **gtp attribute secondary-rat-usage**: Sends an optional attribute Secondary RAT usage records.
- **default gtp attribute secondary-rat-usage**: Sends an optional attribute Secondary RAT usage records by default.
- **no gtp attribute secondary-rat-usage**: Does not send the optional attribute Secondary RAT usage records.

### Controlling the Maximum Number of Entries

When the Secondary RAT usage record reaches the maximum configured value within a CDR, the CDR closure cause occurs and uses **maxChangeCond**. The **gtp limit-secondary-RAT-usage** CLI command controls the maximum number of Secondary RAT usage record entries in the P-GW and S-GW CDRs. If the limit is configured with a value more than 32, the partial CDRs get generated with a maximum of 32 for S-GW CDR.




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**Note** The existing behaviour of S-GW has a limit of 32 Secondary RAT Usage records.

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The following table explains the behavior of Secondary RAT records and CDR, and the maximum limit.

SI. Number	CDR Type	Configured limit-secondary-rat-usage	Effective Maximum Limit	No. of Secondary RAT records Sent by UE	Behavior of Secondary RAT Records and CDR
1	P-GW	Less than 32 Example: 20	20	35	Partial CDR is generated with 20 secondary RAT records.
					Remaining 15 secondary RAT records sent in the next trigger.
	S-GW	Less than 32 Example: 20	20	35	Partial CDR is generated with 20 Secondary RAT records.
					Remaining 15 Secondary RAT records sent in the next trigger.
2	P-GW	32	32	35	Partial CDR is generated with 32 Secondary RAT records.
					Remaining 3 secondary RAT records sent in the next trigger.
	S-GW	32	32	35	Partial CDR is generated with 32 secondary RAT records.
					Remaining 3 secondary RAT records sent in the next trigger.

SI. Number	CDR Type	Configured limit-secondary-rat-usage	Effective Maximum Limit	No. of Secondary RAT records Sent by UE	Behavior of Secondary RAT Records and CDR
3	P-GW	Greater than 32 Example: 100	100	100	Partial CDR is generated with 100 secondary RAT records.
	S-GW	Greater than 32 Example: 100	32	100	Three partial CDRs are generated with 32 secondary RAT records each.  Remaining 4 secondary RAT records sent in the next trigger.
4	P-GW	Not configured	255	1000	Three partial CDRs are generated with 255 secondary RAT records each.  Remaining reported Secondary RAT records become a part of CDR in the next trigger.
	S-GW	Not configured	32	1000	No partial CDR is generated.  32 Secondary RAT records become part of the CDR in the next trigger.

Use the following configuration to control the maximum number of entries.

```

configure
context context_name
  gtpv group group_name
    gtpv limit-secondary-rat-usage usage_limit
  default gtpv limit-secondary-rat-usage

```

```
no gtp limit-secondary-rat-usage
end
```

**NOTES:**

- **gtp limit-secondary-rat-usage *usage\_limit***: Enter a maximum number of secondary RAT reports. *usage\_limit* must be an integer in the range of 1-100. The recommended value for S-GW CDR is 32. For example, if the limit is set to 10, then the CDR is generated once the configured value is reached.
- **default gtp limit-secondary-rat-usage**: Specifies a default value of 32.
- **no gtp limit-secondary-rat-usage**: Disables the CDR generation with limited number of secondary RAT usage information.

## Suppressing Zero-Volume Secondary RAT Usage Report

Use the following configuration to suppress zero-volume Secondary RAT Usage report.

```
configure
context context_name
  gtp group group_name
    gtp suppress-secondary-rat-usage zero-volume
  default gtp suppress-secondary-rat-usage zero-volume
  no gtp suppress-secondary-rat-usage zero-volume
end
```

**NOTES:**

- **gtp suppress-secondary-rat-usage zero-volume**: Suppresses either Secondary RAT records or zero volume Secondary RAT records.
- **default gtp suppress-secondary-rat-usage zero-volume**: Does not suppress the zero volume secondary RAT usage records.
- **no gtp suppress-secondary-rat-usage zero-volume**: Does not suppress the zero volume Secondary RAT usage records.

## Monitoring and Troubleshooting

This section provides information on how to monitor and troubleshoot using show commands available in support of this feature.

### Show Commands and Outputs

This section provides information regarding show commands and their outputs for this feature.

#### show config

The output of this CLI command displays the following parameters.



Field	Description
<b>gtpp attribute secondary-rat-usage</b>	Specify this option to include the Secondary RAT reports field in the CDR.
<b>gtpp suppress-secondary-rat-usage zero-volume</b>	Enables the exclusion of the zero volume Secondary RAT reports in the CDR.
<b>gtpp limit-secondary-rat-usage</b>	Enables limiting the number of Secondary RAT Usage reports in CDR with the configured value.

## show config verbose

The output of this CLI command displays the following parameters.

Field	Description
<b>gtpp attribute secondary-rat-usage</b>	Displays the Secondary RAT usage records.
<b>gtpp suppress-secondary-rat-usage zero-volume</b>	Displays only Secondary RAT records that is having non-zero volumes from P-GW and S-GW.
<b>gtpp limit-secondary-rat-usage</b>	If total received Secondary RAT records are multiples of 10, displays multiple CDR generated by P-GW and S-GW. The reported cause value will be the maximum change condition.
<b>no gtpp limit-secondary-rat-usage</b>	Displays Secondary RAT records for unconfigured cause.

## show gtpp group

The output of this CLI command displays the following parameters.

Field	Description
<b>Secondary RAT records present</b>	Specifies whether the Secondary RAT record is present or not. The available options are: <ul style="list-style-type: none"> <li>• no</li> <li>• yes</li> </ul>
<b>Limit-secondary-rat-usage</b>	Specifies a limit for Secondary RAT usage report.

## show gtpp statistics group

The output of this CLI command displays the following parameter.

Field	Description
<b>Total PGW-CDR exceed size limit</b>	Displays the total number of CDRs that exceeded size limit in P-GW.

show gtp statistics group