



# Extended MBR AVP Support within Override Control

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## Feature Summary and Revision History

### Summary Data

Applicable Product(s) or Functional Area	P-GW ECS
Applicable Platform(s)	<ul style="list-style-type: none"><li>• ASR 5500</li><li>• VPC-DI</li><li>• VPC-SI</li></ul>
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not applicable
Related Documentation	<ul style="list-style-type: none"><li>• <i>ECS Administration Guide</i></li></ul>

### Revision History

Revision Details	Release
This Extended MBR AVP in Override Control feature is fully qualified in this release.	21.20.3

Revision Details	Release
<p>In this release, support is added for Extended MBR AVP in Override-Control feature to allow the overridden parameters to be specified for a rule (static or predefined), for one or all charging actions (using a wildcard), with the ability to exclude certain rules.</p> <p><b>Note</b> This feature is not fully qualified in this release and is available only for testing purposes. For more information, contact your Cisco Account Representative.</p>	21.20

## Feature Description

To obtain the User Equipment (UE) speed above 4.2 Gbps, PCRF must send Override Control AVPs that support Tethering traffic MBR and/or GBR up to 10Gbps when UE moves to 5G coverage area. However, the existing override-control customized AVP definition only supports the actual speed up to 4.2 Gbps. This is because the maximum rate defined for Max-Requested-Bandwidth-DL/UL and Guaranteed-Bitrate-DL/UL are limited to  $(2^{32}-1)$  bps.

To address this requirement, the override control feature is enhanced to support the following four new AVPs, which are represented in kbps. With the extended AVPs, speeds up to 4.2 Tbps are supported:

- Override-Extended-Max-Requested-BW-UL
- Override-Extended-Max-Requested-BW-DL
- Override-Extended-Guaranteed-Bitrate-UL
- Override-Extended-Guaranteed-Bitrate-DL

These new AVPs allows PCEF to set the Extended Maximum Bandwidth/Bitrate. These overrides shall be sent by PCRF using the Override Control AVP construct in a Credit Control Answer (CCA) or ReAuth-Request (RAR) message over Gx interface.

## How it Works

The following table summarizes the Override and the corresponding Override-Extended AVPs. The fundamental difference between the Override and the corresponding Override-Extended AVPs is the unit in which the bitrate is specified. While the former specifies the bitrate in bit per second, the latter has the unit in kbps. Both being an unsigned-32 integer, the former supports a bandwidth limitation of ~4.2Gbps, while the latter supports bandwidth up to ~4.2Tbps.

**Table 1: Override AVPs for which Override-Extended AVPs are defined**

Override AVP (Unit = bits per sec)	Override-Extended AVP (Unit = kilobits per sec)
Override-Max-Requested-BW-UL	Override-Extended-Max-Requested-BW-UL
Override-Max-Requested-BW-DL	Override-Extended-Max-Requested-BW-DL
Override-Guaranteed-Bitrate-UL	Override-Extended-Guaranteed-Bitrate-UL

Override AVP (Unit = bits per sec)	Override-Extended AVP (Unit = kilobits per sec)
Override-Guaranteed-Bitrate-DL	Override-Extended-Guaranteed-Bitrate-DL

The following table summarizes how the AVPs are applied at P-GW. P-GW applies either Override or corresponding Override-Extended AVPs only and not the combination of both. P-GW simultaneously supports UEs with Override AVPs or Override-Extended AVPs.

**Table 2: P-GW Application of Override and/or Override-Extended AVPs for a UE**

CCA-I/CCA-U/RAR	Action at P-GW
All parameters received as Override AVP	Override parameters received in CCA-I applied and subsequently updated with params received in CCA-U. This legacy behavior applies to UEs for which the PCRF policy is unchanged.
All parameters received as Override-Ext AVP	Override-Extended parameters received in CCA-I, which is applied and subsequently updated with parameters received in CCA-U.
Some parameters received as Override and some others as Override-Ext	If the Parameter have both Override-MBR and Override-Extended-MBR AVPs, the extended override parameter is applied.
For a UE with Extended Parameter (s) applied once	<p>If extended parameter (s) is applied once, then the subsequent updates happen only through extended override parameters. Any updates with override parameter shall be ignored.</p> <p>For example, If there are Override-Max-Requested-BW-UL AVP and Override-Max-Requested-BW-DL and their corresponding extended AVPS, “Override-Extended-Max-Requested-BW-UL” and “Override-Extended-Max-Requested-BW-DL,” when there is an update with Override-Max-Requested-BW-UL AVP and Override-Max-Requested-BW-DL, then the corresponding extended parameters (Override-Extended-Max-Requested-BW-UL) are applied already. If there are any subsequent updates to Override-Max-requested-BW_DL the updates will happen only through Override-Extended-Max-Requested-BW-UL. Any updates on Override-Max-Requested-BW-DL shall be ignored.</p>

## Monitoring and Troubleshooting

This section provides information on the show commands available to support this feature.

### Show Commands and Output

#### show active-charging subscribers callid override-control

The output of this command includes the following fields:

Override Control:

- Extended MBR UL—This AVP defines the maximum bit rate in kbps that is allowed for the uplink direction.
- Extended MBR DL—This AVP defines the maximum bit rate in kbps that is allowed for the downlink direction .
- Extended GBR UL—This AVP defines the guaranteed bit rate in kbps that is allowed for Uplink direction. This AVP is included only for rules on dedicated bearers.
- Extended GBR DL—This AVP defines the guaranteed bit rate in kbps that is allowed for downlink direction. This AVP is included only for rules on dedicated bearers.