

# PCRF (Policy and charging Control Function) with standard Rx Interface for IMS AS

## 1- The PCRF allows to sell the better data service bandwidth and to provide it when needed

PCRF is a term, introduced in 2007 when standards for the 3GPP Policy Charging Control (PCC) architecture were published. The PCRF function is part of the larger PCC architecture, which also includes the Proxy Call Session Control Function (P-CSCF) and the Policy and Charging Enforcement Function (PCEF) which in Halys systems is integrated in the S/PGW-GGSN with the Gx/Diameter to the PCRF. Combined, the elements of the PCC provide access, resource, and quality-of-service (QoS) control. PCRF is an important part of IMS architectures, although it is not exclusive to the 3GPP-based network.

For example, Mobile Network Operators can use PCRF to charge subscribers based on their volume of usage of high-bandwidth applications, charge extra for QoS guarantees, limit app usage while a user is roaming, or lower the bandwidth of wireless subscribers using heavy-bandwidth apps during peak usage times. The PCRF has a common data base with the HLR-HSS which simplifies the provisioning of users' profiles.

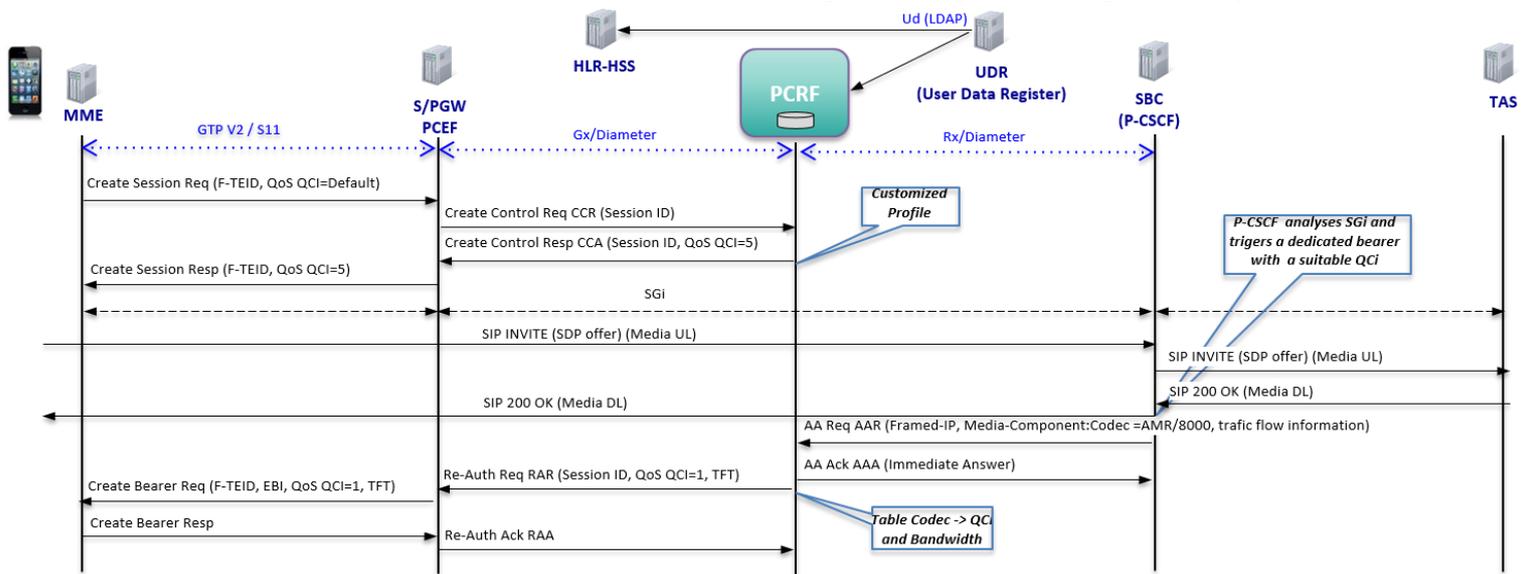


Fig. 1 Combined 3G GGSN and 4G PDN-GW with 3GPP Charging and PCC Interfaces

## 2- PCRF various applications

The Halys PCRF comes with the standard QoS tailoring application which uses the individual subscribers profiles and allows to sell the better QoS. The profiles are provided from the common UDR with the HLR-HSS.

In addition, it provides specific Halys applications:

- Pre-emptive dynamic priorities (Halys patent) in order to force pre-emptively the priority of special subscribers (public safety usage of mobile networks)
- Forcing of QoS based on its availability in the visited network (uses a table of the world's network).

## 3- AS or SBC Rx interface to create dedicated bearers

The PCRF implements the AAR request that it receives with the AVP media description in order to compute the Re-Auth request that it sends to the PCEF to create the dedicated bearer.

This is used when the SBC or the AS detects a voice or visio service. This is a very important PCRF application.

#### 4- Platforms and Scalability

Can run on virtualized environments (VMware) with Linux SUSE. Any Intel hardware may be used. Multi-threaded implementation allowing to fully use multi-processor multi-core servers.

#### 5- Redundancy

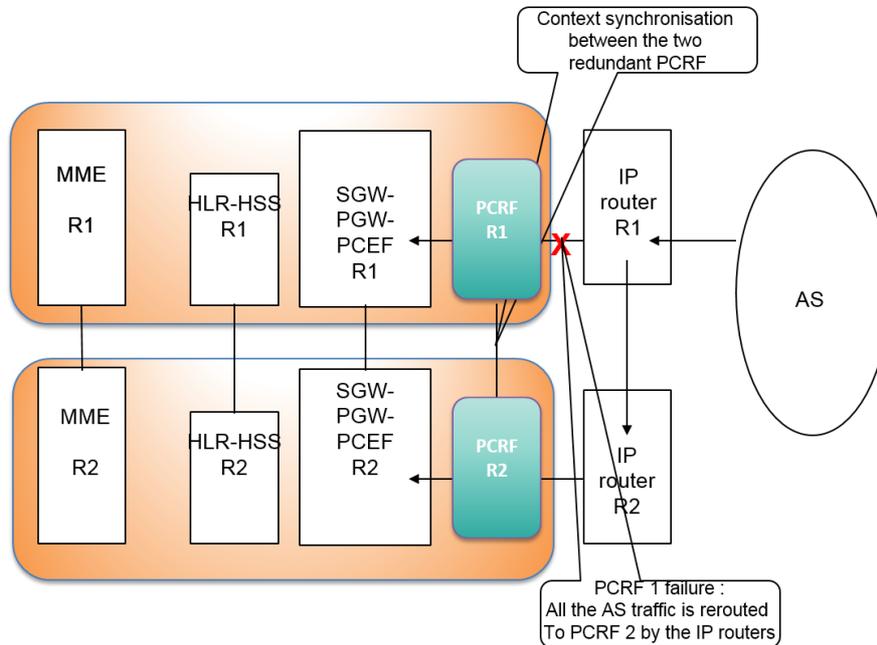


Fig. 2 Active-active load balancing PCRF redundancy architecture

Redundancy uses two different instances of the PCRF on two separate servers. Each synchronises with the other when new PCRF sessions are created or ended. If one instance R1 fails, the external interface is automatically closed. The AS sessions are then routed automatically to the second instance R2 which had a copy of the context and is thus ready to pursue the PCRF session.

#### 6-Standards compliance for interoperability

The Halys product is standard based and compliant in particular with the following standards :

- Gx diameter 3gpp 29.212 Rel 12, Interface with the PCEF of the S/PGW
- Rx 3gpp TS 29.214 Rel 12, Interface with the AS to create dedicated bearers from the IMS SBC (P-CSCF)
- Ud 3gpp TS 29.335 Rel 12, LDAP interface with the UDR to provision the individual QoS and maximum volume
- TS 29.213 Rel.13, LTE; Policy and charging control signaling flows and Quality of Service (QoS) parameter mapping

##### Technical Data:

*Linux OS on Intel Servers or Virtual Machines*

*Scalability: typically up to 2 million subscribers and clustering above*

*Licensing: Pay-as-you-grow capacity license based on the number of sessions and the set of applications.*

##### Halys patents used:

EP14 193 815.9 - FP10 00 217 621 Pre-emptive capability allocation management for GGSN and PGW