Idle Seconds Micro-checkpoint

This chapter describes the implementation of a timer to track inactive sessions and to cleanup the sessions once the timer expires.

Feature Description

Idle timeout is used to track the inactive sessions on ePDG and clean them up once they have been idle for certain duration as defined by the idle timeout value. Currently, AAA provides PDN Inactivity timer value per session to ePDG via SWm interface. Both active and standby chassis track idle time of inactive sessions so that they can be removed from the chassis post timeout. The active chassis tracks the active sessions and notifies the standby chassis at every periodic timer expiry that the session is not idle. On the active chassis, both the Session Manager and ICSR framework track the active sessions and notify the standby periodically that the session is not idle.

Session managers send idle micro checkpoints every 10 seconds to corresponding session manager on the standby chassis.

To avoid frequent periodic idlesec micro checkpoints, Interval at which these checkpoints are sent is made configurable.

Also an event driven mechanism for idlesec micro checkpoints for ePDG is allowed to eliminate the overhead associated with periodic idlesec micro checkpoints.

Configuration based on Periodic Idle Seconds Micro-checkpoints

In this approach the existing hard coded idle timer of Session Manager is configurable per APN.

This approach involves:

- A new CLI is provided to configure the periodic idle second micro checkpointing timer.
- Timer is configurable on per APN basis. The default timer value is 10 Seconds.
- Value "0" means disabled i.e. the change from micro checkpointing to standby does not take place.
- ICSR framework will remove the 30 seconds timer and keep 15 min periodic timer notification.

Event Based Idle Seconds Micro-checkpoint

In this approach an idle second micro checkpoint is sent from Active to Standby chassis when session changes from active to idle or vice versa. The micro checkpoint carries the timestamp when session became active or idle. Upon receipt of the micro checkpoint, standby chassis updates the active/idle time using the timestamp received in the micro checkpoint. This process enables the Active and Standby chassis to be synchronized with respect to when a particular session became active or idle

This approach involves the following processes:

- Active chassis sends an idle second micro checkpoint with timestamp to Standby chassis when a session changes from *active* to *idle* or *idle* to *active* state.
- Upon receipt of the idlesec micro checkpoint, the Standby chassis records the timestamp at which session became *active* or *idle* .
- When switch over happens, standby uses the timestamp that was stored to adjust the inactivity time. For example, if session becomes inactive at time T, and switch over occurs at time T+1000 seconds, standby will set initial value of the PDN Inactivity timer after subtracting 1000 seconds.
- The configuration is available on per APN level to enable this functionality, and also to configure the duration after which a session is considered as idle if data is not received or sent.
- The default value for this configuration is 180 seconds.
- A similar option is provided at ePDG service level in case APN configuration is not being used on the system. APN configuration overrides the service level configuration.

Assumptions and Limitations

1. Per APN configurations will be done under apn-profile and per service configurations will be done under ePDG service configuration mode.
2. The idle timeout configuration under default-subscriber mode would be retained only for backward compatibility and will have last preference.
3. The idle second micro-checkpoint timer configuration and the deemed idle time configuration under subscriber mode will not have any impact even if configured.
4. The order of priority of idle timeout configuration would be AAA received > configured under default-subscriber > configured under apn-profile > configured under service. However, default-subscriber configuration is not recommended and should be used only for backward compatibility.
5. The order of priority of idle second micro-checkpoint timer configuration and the deemed idle time configuration would be configured under apn-profile > configured under service.
6. When encoding of IDLE second micro checkpoint by ICSR is successful and just before the checkpoint is to be sent to standby chassis, if there is a link flap the checkpoint is lost. But anyways the ICSR framework will again send the same after 15 minutes. If any switch over happens after flap and within 15 minutes, the transition information is lost.