



DSR Flag and PTW Subscription Withdrawal on eDRX

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Feature Summary and Revision History

Summary Data

Applicable Products or Functional Area	<ul style="list-style-type: none"> • C-SGN • MME
Applicable Platforms	<ul style="list-style-type: none"> • ASR 5500 • UGP • VPC-DI • VPC-SI
Feature Default	Disabled - Configuration Required (eDRX feature) Enabled - Configuration Required (eDRX GPS time support in 21.4)
Related Changes in This Release	Not applicable
Related Documentation	<ul style="list-style-type: none"> • <i>Command Line Interface Reference</i> • <i>Statistics and Counters Reference</i> • <i>Ultra IoT C-SGN Administration Guide</i> • <i>MME Administration Guide</i>

Revision History

Revision Details	Release
Support is added for Delete Subscriber Data Request (DSR) flag bits 28 and 30 Paging Time Window (PTW) subscription withdrawal with eDRX.	21.26
Paging eDRX H-SFN changed to 10 bits counter.	21.11.3
The eDRX feature is enhanced to support H-SFN Start time configuration in GPS format and H-SFN Reference time in GPS and UTC format. The edrx command in the MME Service Configuration mode is enhanced in this release. For more information, see <i>Configuring Hyper SFN Synchronization</i> chapter in the <i>MME Administration Guide</i> . The feature default for this enhancement is "Enabled - Configuration Required".	21.4
The feature is tested and qualified on the ASR 5500 platform.	21.3
The enhancements in the N5.1 release include: <ul style="list-style-type: none"> • MME supports configuration of the T3415 paging timeout value. MME uses the T3415 timer for eDRX UEs. • The edrx CLI command is enhanced to support DL Buffering Suggested Packet Count in DDN ACK when unable to page UE. • Support of the DL-Buffering-Suggested-Packet-Count AVP 	N5.1 (21.1.V0)
First introduced.	21.0

Feature Description

The MME is enhanced to support Delete Subscriber Data Request (DSR) flags bits 28 and 30, and Paging Time Window (PTW) subscription withdrawal with eDRX. This feature supports the eDRX related Radio Access Technology (RAT) AVP in the DSDR message. This feature is beneficial to the Session Manager (SessMgr) running the MME application stack.

For more information, see the *eDRX Support on the MME* chapter in the *MME Administration Guide*.

How It Works

In MME, Home Subscriber Server (HSS) sends eDRX and PTW information as part of Update Location Answer (ULA) and/or Delete Subscriber Data Request (DSDR). After ULA, when MME receives a DSDR message with 28th and 30th bit set, MME deletes the stored HSS subscription data related to eDRX accordingly. The 28th bit set is for PTW withdrawal and 30th bit set is for eDRX withdrawal.

If MME receives the eDRX-Related-RAT AVP (1705) with the DSR flag set for eDRX withdrawal, the MME compares the RAT type of the subscriber session with the received RAT type in eDRX-Related-RAT AVP. If it matches, then the MME resets the eDRX information to the values negotiated in the Attach Request.

Monitoring and Troubleshooting

This section provides information to monitor and troubleshoot this feature using show commands.

Show Commands and Outputs

This section provides information about the show commands and outputs to displays the current Paging eDRX information of a subscriber.

show mme-service session full all | grep Paging

Table 1: show mme-service session full all | grep Paging Command Output Descriptions

Field	Description
SessMgr Instance	The Session Manager instance managing this session.
Paging eDRX	The following are the paging eDRX parameters: <ul style="list-style-type: none"> • eDRX cycle length • PTW
MSID	The UE identity (MS Identity) of a connected subscriber to an MME service, and whether the subscriber is unauthenticated (such as during emergency attach).
Callid	The call identity in 8 digit hex number of connected calls to an MME service.
MME Service	The name of the serving MME service of which information is displayed.
MME HSS Service	The name of the serving MME-HSS service which is used for AAA for this subscriber with HSS on S6a interface.
EGTP S11 Service	The name of the serving eGTP service which is used for connectivity between MME and S-GW on S11 interface.
MME S1 Address	The IP address of MME used for connecting with eNodeB on S1-MME interface.
EGTP S11 Address	The IP address assigned to eGTP service which is used for connectivity between MME and S-GW on S11 interface.
ME Identity	The mobile equipment identity of connected UE.
GUTI	The Globally Unique Temporary Identifier (GUTI) used for this subscriber session. GUTI is constructed with following identifiers: <ul style="list-style-type: none"> • PLMN (MMC and MNC) • MME Group ID (MMEGI) • MME Code (MMEC) • MME TMSI (M-TMSI)

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Field	Description
MSISDN	The Mobile Station International ISDN Number (MSISDN) of connected EPS subscriber to an MME service.
EMM State	The status of EPS Mobility Management (EMM) session of connected subscriber. Possible status are: <ul style="list-style-type: none"> • Registered • Connected
ECM State	The status of EPS Connection Management (ECM) session of connected subscriber. Possible status are: <ul style="list-style-type: none"> • Registered • Connected • Idle
Attach type	Indicates the type of UE attachment of active subscriber to MME service, for example: Emergency or Initial EPS.
Active SGW S11 Addr	The IP address of S-GW connected to MME on S11 interface.
SGW Control TEID	Displays the TEID of the S-GW currently serving the UE.
UE Offloading	Displays the UE offload state for load rebalancing. Possible values are None, Marked, In-Progress and Done.
UE Reachability Timer	The configured value of the mobile reachability timer set for tracking UE in EMM session.
Remaining Time	The remaining time in seconds out of the configured value of the mobile reachability timer in the EMM session.
Paging Proceed Flag (PPF)	The current state of the Paging Proceed Flag indicating whether or not the UE is sending periodic TAUs within the span of the mobile reachability timer. If the UE fails to send a TAU within the timer value, this flag is set to "Paging Disabled" indicating that the MME is no longer paging the UE.
ISR Status	Displays if the session is using Idle mode Signaling Reduction (ISR). Possible configurations are Activated or Not activated.
Low Access Priority Indication	Displays whether this session has LAPI indicator in any of attach/extended service/TAU/bearer resource allocation/bearer resource modification/PDN connectivity requests.
Initial UE establishment cause	Displays the establishment cause as set in the Initial UE message: Delay Tolerant Access / High Priority Access / Emergency / MT-Access / Unknown
Peer SGSN	Displays the IP address of the SGSN which has a context for this UE in support of Idle mode Signaling Reduction (ISR). A Peer SGSN address is only shown when ISR is activated for this session.

Field	Description
UE Capability Information	This group shows the UE Capability information for connected UE received by an MME service.
Radio Capability	The radio capability information received by an MME service for connected UE in UE capability exchange message.
Radio Capability for Paging	The radio capability information received by an MME service for paging the UE. This field displays the value in hexadecimal format if the UE receives "UE Radio Capability for Paging" IE in S1 "UE-CAPABILITY-INFO-INDICATION" message from eNB. Otherwise, this field displays N/A.
Supported Codec List	The Supported Codec List information received by an MME service for connected UE in UE capability exchange message.
Mobile Station Classmark 2	The Mobile Station Classmark 2 information received by an MME service for connected UE in UE capability exchange message.
Mobile Station Classmark 3	The Mobile Station Classmark 3 information received by an MME service for connected UE in UE capability exchange message.
Security Mode Information	This group shows the status of NAS integrity check and NAS ciphering along with applicable algorithm as security mode information. It contains following information: <ul style="list-style-type: none"> • NAS Integrity Check • NAS Integrity Check Algorithm • NAS Ciphering • NAS Ciphering Algorithm
Active ENodeB information	This group shows the information of active eNodeB serving to this session.
Global ENodeB ID	The global identifier of active eNodeB serving to this session.
S1AP End Point	The IP address used by eNodeB on S1AP interface to connect with MME service.
Crypto-map Name	The name of the crypto map supporting this EnodeB association.
MME UE S1AP ID	Indicates the session identifier between MME and UE on S1AP interface serving to this session.
ENodeB UE S1AP ID	Indicates the session identifier between eNodeB and UE on S1AP interface serving to this session.
MME UE S1AP ID (stack):	Indicates up to three MME UE S1AP session identifiers present in this S1AP stack.
ENodeB UE S1AP ID (stack):	Indicates up to three eNodeB UE S1AP session identifiers present in this S1AP stack.
Total S1AP ID (stack)	Indicates the total count of S1AP session identifiers present in the stack.
Idle Mode Information Data	This group shows the information for the sessions in ECM idle mode.
Last TAI	Tracking Area Identity of the last Tracking Area visited by UE.

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Field	Description
Last ECGI	E-UTRAN Cell Global Identifier of the last Cell visited by UE.
Last Connected ENodeB	Displays information about the ENodeB to which the session was last connected. <ul style="list-style-type: none"> • Global ENodeB ID: Global ENodeB Identifier of the ENodeB to which the UE last connected. • S1AP End Point: End Point IP Address of the ENodeB to which the UE last connected.
UE Subscription Data	This group shows the subscribed aggregate maximum bit rate applicable for connected UE in this session.
UE-UL-AMBR	The subscribed aggregate maximum bit rate in bits per second in upload traffic for connected UE in this session.
UE-DL-AMBR	The subscribed aggregate maximum bit rate in bits per second in download traffic for connected UE in this session.
Enforced UE-UL-AMBR at eNodeB	The enforced aggregate maximum bit rate in bits per second in upload traffic for connected UE at eNodeB in this session.
Enforced UE-DL-AMBR at eNodeB	The enforced aggregate maximum bit rate in bits per second in download traffic for connected UE at eNodeB in this session.
PDN Information	This group shows the information of PDNs connected for this session.
APN Name	The APN name which is serving for this PDN in this session.
UE Requested APN	Displays the UE requested APN with non-standard characters in hexadecimal format and standard characters in normal string format.
APN Restriction	The total number of APN restriction applied to this PDN.
PDN Type	The type of PDN (IPv4 and/or IPv6) which is serving in this session for PDN.
PGW Address	The IP address of the P-GW which is serving this session for connected PDN.
PGW control TEID	The control tunnel end identifier at P-GW on S5/S8 interface for control messaging serving to this session.
UE IPv4 Address	The IP address allocated to UE while connected to PDN in this session.
APN-UL-AMBR	The applicable aggregate maximum bit rate in bits per second in upload traffic for APN serving this PDN.
APN-DL-AMBR	The applicable aggregate maximum bit rate in bits per second in download traffic for APN serving this PDN.
Bearer Suspension State	The current suspension state of the bearer.
CSG Cell Change Notification	Displays CSG Information Reporting as specified by the PGW. If enabled, the MME sends notification when the UE enters or leaves a closed CSG cell.

Field	Description
CSG Subscribed Hybrid Cell Change Notification	Displays CSG Information Reporting as specified by the PGW. If enabled, the MME sends notification when the UE enters or leaves a hybrid cell as a subscribed member of the CSG in question.
CSG Unsubscribed Hybrid Cell Change Notification	Displays CSG Information Reporting as specified by the PGW. If enabled, the MME sends notification when the UE enters or leaves a hybrid cell with unsubscribed (non-member) status of the CSG in question
Marked for Deletion	Displays whether the PDN has marked for deletion flag set.
APN Restoration Priority	Displays the priority for reactivating impacted PDNs following a P-GW Restart Notification (PRN) where 1 is highest priority, 16 is lowest.
Low Access Priority Indication	Displays whether this PDN has LAPI indicator set as received in PDN connectivity requests.
Bearer Id	The identifier used for bearer between eNodeB and S-GW while connected to PDN in this session.
QCI	The quality class identifier applicable for this MME session.
AMBR	The applicable aggregate maximum bit rate in bits per second in download/upload direction for APN serving this PDN.
S1U ENodeB TEID	Indicates the tunnel end identifier at eNodeB on S1-U interface serving to this session.
S1U SGW TEID	Indicates the tunnel end identifier at S-GW on S1-U interface serving to this session.
S5S8 PGW TEID	Indicates the tunnel end identifier at P-GW on S5/S8 interface serving to this session.
S1U ENodeB IPv4 Addr	Indicates the IPv4 address used at eNodeB while connecting to S-GW on S1-U interface serving to this session.
S1U ENodeB IPv6 Addr	Indicates the IPv6 address used at eNodeB while connecting to S-GW on S1-U interface serving to this session.
S1U SGW IPv4 Addr	Indicates the IPv4 address used at S-GW while connecting to eNodeB on S1-U interface serving to this session.
S1U SGW IPv6 Addr	Indicates the IPv6 address used at S-GW while connecting to eNodeB on S1-U interface serving to this session.
S5S8 PGW Addr	Indicates the IP address used at P-GW while connecting to S-GW on S5/S8 interface serving to this session.
ESM State	The EPS session Management status serving to this session.
Bearer Type	The type of bearer used for this session. Possible values are: <ul style="list-style-type: none"> • Default • Dedicated
ARP	The Allocation Retention Priority value assigned to the bearer. The HSS assigns the value for default bearers and the P-GW assigns it for dedicated bearers.

Field	Description
PCI	Specifies the ARP Pre-emption Capability Indicator, either Enabled or Disabled.
PVI	Specifies the ARP Pre-emption Vulnerability Indicator, either Enabled or Disabled.
PGW-C+SMF Selected	Specifies that Combined PGW-C/SMF selection indicator, either Yes or No.
Marked for Deletion	Displays whether the bearer has marked for deletion flag set.
Total PDNs	The total number of PDNs connected through this session for a subscriber.
Total Bearers	The total number of bearers created for UE to use in this session.
Max APN Restrictions	The maximum number of APN restrictions applied to this PDN.
Tracking Area Information	This group displays the tracking area information available for this session.
TAI of last TAU	The tracking area identifier used in last Tracking Area Update (TAU) message received for TAU procedure in this session.
Current Tracking Area List	The tracking area list used for TAU procedure in this session.
CSG Information	This group displays Closed Subscriber Group information relating to this session.
CSG ID at Last Connection	Displays the CSG ID for this session. This is a unique identifier within the scope of PLMN which identifies a Closed Subscriber Group (CSG) in the PLMN.
CSG Cell Type	Displays the Closed Subscriber Group cell access mode (type) for this session, either Closed or Hybrid.
CSG Membership Status	Displays if the session is a member of the cell's CSG. Possible values are Member or Non-Member.
Operator Policy Association	The operator policy associated with this PDN.
CSFB Information	This group displays the Circuit-Switched Fall Back configuration associated with the session.
SGS Assoc State	The state of the SGs association with the VLR for the UE as determined by the MME. Possible states are: <ul style="list-style-type: none"> • SGs-NULL: Specifies that there is no SGs association with the VLR for the UE. In this state, no fields in this group will display information. • LA_UPDATE_REQUESTED: Specifies that the MME has requested an update location from the VLR before sending a response to the UE • SGs-ASSOCIATED: Specifies that the MME has stored an SGs association for the UE.
SGS Service	The name of the configured SGs service associated with the session.
VLR	The name of the VLR, as configured in the SGs service, associated with the session.
LAI	The Location Area Identifier to which the UE is mapped.

Field	Description
Pool Area	The name of the configured Location Area Code (LAC) pool area associated with the SGs service and the session.
P-TMSI	The Packet-Temporary Mobile Subscriber Identifier allocated by the MSC for the UE.
Flags	The current active variables associated with the UE. Possible states are: <ul style="list-style-type: none"> • SMS-Only: Specifies that the UE is combined attached for SMS services only. • MME Reset Indicator: Specifies that the MME has restarted after a failure. • VLR Reliable Indicator: Specifies that the MME has received a reset indication from the VLR. • VLR Offload: Specifies that the UE is set to offload state. • Non-EPS Alert: Specifies that the VLR is requesting from the MME an indication when any signaling activity from the UE is detected.
CIoT Optimisation Information	Displays the CIoT optimization information.
NB-IoT RAT	Displays if the RAT type NB-IoT is either enabled or disabled.
Attach Without PDN Support	Displays if attach without PDN support is either enabled or disabled.
UE capable of operating in CE-mode-B	Displays "TRUE" or "FALSE" to indicate if UE is operating in CE Mode-B.
Access Profile Association	Displays the configured access-profile name.
DECOR Information:	
UE Usage type	Displays the configured UE usage types.
DCN Id	Displays the configured DCN identifier.
UE DC-NR Information:	
DC-NR capable UE	Indicates whether the UE is DCNR capable.
DC-NR operation allowed	Indicates whether the DCNR operation is allowed by MME for the DCNR capable UE.
UE N1-Mode Information	
N1-mode capable UE	Indicates whether the UE N1 mode information is allowed by MME for the N1-mode capable UE.

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