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2 **PROJECT:** T1P1 Activity on Lawful Intercept for UMTS

3

4 **TITLE:** Recommended changes to TS 33.108 to address Packet Activity
5 Detection and IRI reporting (Issue #2 in Issues list documented in
6 T1P1/2002-004).

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25 **LOCATION:** Irving, Texas

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27 **ABSTRACT**: Recommended changes to TS 33.108 to address Packet Activity Detection
28 and IRI Reporting (PAD-IR).

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30 **DISTRIBUTION:** T1P1.SAH

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NOTICE

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2 Summary

3 This contribution provides proposed changes to TS 33.108 to support the Packet Activity Dection and IRI
4 reporting capability. The changes to the current text in TS 33.108 are included as blue text.

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6 Recommendation

7 Approve, adopt and forward all proposed changes to 3GPP SA3 LI.

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1. Changes to TS 33.108 to address Packet Activity Reporting Events

1.1   Changes to Clause 6.5 of TS 33.108

The following text changes need to be incorporated into Clause 6.5 of TS 33.108:

Table 1: Mapping between UMTS Data Events and HI2 records type

Event	IRI Record Type
GPRS attach	REPORT
GPRS detach	REPORT
PDP context activation (successful)	BEGIN
PDP context activation (unsuccessful)	REPORT
Start of intercept with PDP context active	BEGIN
PDP context deactivation	END
Cell and /or RA update	REPORT if no PDP context is active CONTINUE if, at least, one PDP context is active
SMS	REPORT
Packet Activity Detection and IRI Reporting (PAD-IR)	PAR (Packet Activity Reporting)

1.2   Additions to Table 2 of TS 33.108

The following additional parameters need to be added to Table 2 of TS 33.108:

Table 2: Mapping between Events information and IRI information

parameter	description	HI2 ASN.1 parameter
Originating Address	Reports the source address in an IP packet when reporting packet activity.	originatingAddress
Destination Address	Reports the destination address in an IP packet when reporting packet activity.	destinationAddresss
Packet Activity Count	Reports the number of packets detected over a given monitoring reporting interval.	packetActivityCount
Packet Report Type	Reports the reason (e.g., count threshold reached) for the generation of the packet activity report record.	packetActivityReportType
Originating Port Number	Reports the source transport layer port in an IP packet when reporting packet activity.	packetActivityProtocolInfo (originatingPortNumber)
Destination Port Number	Reports the destination transport layer port in an IP packet when reporting packet activity.	packetActivityProtocolInfo (destinationPortNumber)
Transport Protocol	Reports the Protocol used by the Transport Layer for the source in an IP packet (e.g., TCP, UDP).	packetActivityProtocolInfo (transportProtocol)

1.3   Additions to Clause 6.5 of TS 33.108

Add a new clause to TS 33.108, namely Clause 6.5.1.5, with the following proposed text.

1   ## 6.5.1.5 PAR record information

2   The PAR record is used to convey IRI for the parties to packet communications after a communication path is
3   established by a wireless accessing system between the subject device(s) and the network.

4   The PAR record shall be generated when:

5   ▪ Reporting is performed on an individual intercepted packet basis and a packet is intercepted

6   ▪ Reporting is performed on an aggregate basis and

7   o a count threshold is reached for each originatingAddress/destinationAddress combination

8   o a monitoring interval timer expires

9   o PDP context is deactivated and packets have been intercepted, but IRI for the intercepted
10   packets have been not reported.

11   A PAR record may optionally be triggered when:

12   • the intercept subject generates or receives IP packets, and the originatingAddress / destinationAddress
13   combination changes between consecutive packets generated or received by the intercept subject.

14   To support the reporting of the PAD-IR event, the 3G xGSN shall be able to intercept individual packets sent
15   from or to the interception subject. The PAD-IR event is the interception of each such packet and the
16   extraction of the IRI from that packet. The PAD-IR event shall be reported via the PAR record either
17   individually or on an aggregate basis as described below.

18   **Table 6-16: Parameters for Reporting Packet Activity Events**

Parameter	MOC	Description/Conditions
observed MSISDN	C	Provide at least one and others when available.
observed IMSI		
observed IMEI		
observed PDP address	C	Provide to identify the PDP address of the intercept subject.
event type	C	Provide Packet Activity event type.
event date	M	Provide the date and time the event is detected.
event time		
Access Point Name	C	Provide to identify the packet data network to which the intercept subject is connected.
PDP type	C	Provide to describe the PDP type of the observed PDP address.
network identifier	M	Shall be provided.
correlation number	C	Provide to uniquely identify the PDP context delivered to the LEMF and to correlate IRI records with CC.
lawful intercept identifier	M	Shall be provided.
xGSN address	C	Provide to identify the xGSN node.
Packet Report Type	C	Provide to identify the reason for the generation of the packet activity report (e.g., end of default time interval) when PAD-IR is performed on an aggregate basis.

Parameter	MOC	Description/Conditions
Originating Address	M	Provide to report the source address in an IP packet for PAD-IR.
Destination Address	M	Provide to report the destination address in an IP packet for PAD-IR.
Packet Activity Count	C	Provide to identify the number of packets detected with the same originatingAddress/destinationAddress combination when PAD-IR is performed on an aggregate basis.
Packet Activity Protocol Info	M	Provide the set of observed triplets (transport protocol [e.g., TCP], originating transport port number, and destination transport port number) over the packet activity reporting interval and associated with the same originatingAddress/destinationAddress combination.

When reporting the Packet Activity event on an aggregate basis:

- A count of the number of intercepted packets with a given originating/destination address combination is maintained to provide input to a common PAR record. If this count reaches or exceeds a provisioned threshold for the intercept subject, then a PAR record is generated. The range of the count threshold is 500 to 5000 with a default value of 2500.

- A packet activity monitoring interval is utilized to govern the amount of time over which intercepted packets with a given originating/destination address combination provide input to a common PAR record. If this monitoring interval reaches or exceeds a provisioned threshold for the intercept subject, then a PAR record is generated. The range of the timer threshold is 30 seconds to 5 minutes in (30 second increments) with a default value of 1 minute.

1.4   Additions to Clause B.4 of TS 33.108

The ASN.1 encoding of the **IRIContent** parameter in Clause B.4 of TS 33.108 must be modified to allow for the inclusion of the definition of the PAR record (additions are marked in blue and are underlined).

```
IRIContent        ::= CHOICE
{
    iRI-Begin-record        [1] IRI-Parameters,
    --at least one optional parameter must be included within the iRI-Begin-Record
    iRI-End-record          [2] IRI-Parameters,
    iRI-Continue-record     [3] IRI-Parameters,
    --at least one optional parameter must be included within the iRI-Continue-Record
    iRI-Report-record       [4] IRI-Parameters,
    --at least one optional parameter must be included within the iRI-Report-Record
    iRI-PAR-record       [5] IRI-Parameters,
    --at least one optional parameter must be included within the
    --iRI-PAR-Record
...
}
```

The following five IRI-parameters need to be added to the ASN.1 encoding in TS 33.108 for reporting the Packet Activity events.

```
    originatingAddress       [26] IPAddress  OPTIONAL,
     -- The sourceAddress parameter contains the
     -- source ip address in the intercepted ip packet.
    destinationAddress       [27] IPAddress  OPTIONAL,
     -- The destinationAddress parameter contains the
     -- destination ip address in the intercepted ip packet.
    packetActivityCount [28] Count OPTIONAL,
     -- For aggregate reporting, the packetactivityCount parameter reports the number
```

```
     -- of packets detected that utilized the same
originatingAddress/terminatingAddress
     -- combination over a given packet activity interval
   packetActivityReportReason [29] ReportReason OPTIONAL,
     -- For aggregate reporting, The packetActivityReason parameter indicates the
reason for
     -- generating the PAR record.
   PacketActivityProtocolInfo [30] PacketActivityProtocolInfo OPTIONAL,
```

The following four parameter definitions need to be added to the ASN.1 encoding in Clause B.4 of TS 33.108 for reporting the Packet Activity events.

```
-- PARAMETERS FORMATS
PacketActivityProtocolInfo ::= SEQUENCE OF
{
    transportProtocol    [0] TransportProtocol OPTIONAL,
    -- The transportProtocol parameter reports the
    -- Transport Protocol used by the Transport Layer(e.g., TCP, UDP, SCTP)
    -- in an IP packet when reporting packet activity. The
    -- transportProtocol parameter shall be coded in accordance
    -- with document reference [51].
  originatingPortNumber       [1] PortNumber  OPTIONAL,
    -- The originatingPortNumber is the source transport layer port
    -- in an IP packet when reporting packet activity.  The
    -- originatingPortNumber parameter shall be coded in accordance with
    -- document references [52], [UDP]1, and [SCTP]2.
  destinationPortNumber      [2] PortNumber  OPTIONAL,
    -- The destinationPortNumber is the destination transport layer port
    -- in an IP packet when reporting packet activity.  The
    -- destinationPortNumber parameter shall be coded in accordance with
    -- document references [52], [UDP], and [SCTP].

}

TransportProtocol::= OCTET STRING (SIZE (1))
-- From "Assigned Numbers" RFC 1700 available from the IETF or more recent information
-- can be found at http://www.iana.org/assignments/protocol-numbers.

PortNumber ::= INTEGER (0..65535)

Count ::= INTEGER (0..65535)

ReportReason ::= ENUMERATED
{
    timerExpiry (0),
    countThreshold (1),
    pDPContextDeactivaed (2)
    addressChange (3),
…
}
```

---

[1] STD0006 " User Datagram Protocol (UDP)", 28 August 1980.

[2] RFC 2960 " Stream Control Transmission Protocol (SCTP)", October 2000.

1 The ASN.1 encoding of the **GPRSEvent** parameter in TS 33.108 needs to be modified to add a codepoint for
2 this event (See Clause B.2.6). Within the ASN.1, the following value should be added

3
```
4  GPRSEvent ::= ENUMERATED
5  {
6      pDPContextActivation                   (1),
7      startOfInterceptionWithPDPContextActive (2),
8      pDPContextDeactivation                 (4),
9      gPRSAttach                             (5),
10     gPRSDetach                             (6),
11     locationInfoUpdate                     (10),
12     sMS                                    (11),
13     packetActivityDetectionAndIRIReporting  (?),
14     ...
15 }
16 -- see ref [10]
17
```
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