**SA WG2 Meeting #139ES2-2004251**

**01 - 12 Jun. 2020, Electronic (revision of S2-20xxxxx)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **23.503** | **CR** | 0474 | **rev** | **-** | **Current version:** | **16.4.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Clarification on Network Area Information |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | S2 |
|  |  |
| ***Work item code:*** | xBDT |  | ***Date:*** | 2020-05-22 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | As indicated in the CT3 LS (S2-2003543 / C3-202420), usage of a Network Area Information related to background data transfer policy negotiations is inconsistent in terms of either it is part of the background data transfer policy or the information associate to the policy.Network area information was introduced as an associated parameter to the background data transfer policy as defined in TS 23.203 (see clause 6.1.16 and 7.11.1) to denote the expected area the background data transfer policy is applied to. Hence, we should keep the same definition for 5GC. |
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| ***Summary of change:*** | Update the texts to clarify that Network Area Information is the associated parameter to the background data transfer policy. |
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| ***Consequences if not approved:*** | Unclear on how to determine the Network area information for a background data transfer policy.  |
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| ***Clauses affected:*** | 6.1.2.4 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*FIRST CHANGE*

#### 6.1.2.4 Negotiation for future background data transfer

The AF may contact the PCF via the NEF (and Npcf\_BDTPolicyControl\_Create service operation) to request a time window and related conditions for future background data transfer.

NOTE 1: The NEF may contact any PCF in the operator network.

The AF request shall contain an ASP identifier, the volume of data to be transferred per UE, the expected amount of UEs, the desired time window, the External Group Identifier and optionally, Network Area Information, request for notification. The AF provides as Network Area Information either a geographical area (e.g. a civic address or shapes), or an area of interest that includes a list of TAs or list of NG-RAN nodes and/or a list of cell identifiers. When the AF provides a geographical area, then the NEF maps it based on local configuration into of a short list of TAs and/or NG-RAN nodes and/or cells identifiers that is provided to the PCF. The NEF may map the ASP id based on local configuration into the DNN, S-NSSAI that is provided to the PCF. The request for notification is an indication that BDT warning notification should be sent to the AF. The BDT warning notification indicates to the ASP that the BDT policy needs to be re-negotiated.

NOTE 2: A 3rd party application server is typically not able to provide any specific network area information and if so, the AF request is for the whole operator network.

The PCF shall first retrieve all existing background transfer policies stored for any ASP from the UDR. The PCF may retrieve analytics on "Network Performance" from NWDAF in the area where the UEs of this ASP are expected to be located at a certain time period. The "Network Performance" Analytics includes the tuple-(expected load in the area of interest, expected number of UEs of this ASP in the Area of Interest) following the procedure and services described in TS 23.288 [24]. Afterwards, the PCF shall determine, based on the information provided by the AF, the analytics on "Network Performance" if available and other available information (e.g. network policy and existing background transfer policies) one or more background transfer policies. The PCF may be configured to map the ASP identifier into a target DNN and slicing information (i.e. S-NSSAI), that is used if the NEF did not provide the DNN, S-NSAAI to the PCF.

A background transfer policy consists of a recommended time window for the background data transfer, a reference to a charging rate for this time window and optionally a maximum aggregated bitrate (indicating that the charging according to the referenced charging rate is only applicable for the aggregated traffic of all involved UEs that stays below this value). Finally, the PCF shall provide the candidate list of background transfer policies or the selected background transfer policy to the AF via NEF together with the Background Data Transfer Reference ID. If the AF received more than one background transfer policy, the AF shall select one of them and inform the PCF about the selected background transfer policy.

NOTE 3: The maximum aggregated bitrate (optionally provided in a background transfer policy) is not enforced in the network. The operator may apply offline CDRs processing (e.g. combining the accounted volume of the involved UEs for the time window) to determine whether the maximum aggregated bitrate for the set of UEs was exceeded by the ASP and charge the excess traffic differently.

NOTE 4: It is assumed that the 3rd party application server is configured to understand the reference to a charging rate based on the agreement with the operator.

The selected background transfer policy and the associated information such as the Background Data Transfer Reference ID, the Network Area Information, the volume of data to be transferred per UE, the expected amount of UEs, the one or more instances of the tuple (ASP id, DNN, S-NSSAI) and if the AF subscribed to notifications on changes of the negotiated BDT policy, are finally stored by the PCF in the UDR as Data Subset “Background Data Transfer Data” of the “Policy Data Set”. The same or a different PCF can retrieve this background transfer policy and corresponding related information from the UDR and take them into account for future decisions about background transfer policies for background data related to the same or other ASPs.

When the AF wants to apply the Background Data Transfer Policy to an existing session, then the AF will, at the time the background data transfer is about to start, provide, for each UE, the Background Data Transfer Reference ID together with the AF session information to the PCF (via the N5 interface). The PCF retrieves the corresponding background transfer policy from Policy Data Set in the UDR and derives the PCC rules for the background data transfer according to this transfer policy.

When the AF wants to apply the Background Data Transfer Policy to a future session, then the AF provides, to the NEF, the Background Data Transfer Reference ID together with the External Identifier (i.e. GPSI) or External Group Identifier of the UE(s) that are to be subject to the policy. The NEF translates the External Group Identifier into the Internal Group Identifier or the External Identifier into a SUPI. The NEF stores the Background Data Transfer Reference ID, in the UDR as Application Data Set and Background Data transfer data Subset for an Internal Group Identifier or a SUPI and the ASP id requesting to apply the Background Data transfer Policy to a future session for the UE(s). A PCF that serves the UE(s) (i.e. the PCF that serves the UE for AM Policies) may retrieve the Background Data Transfer Reference ID by retrieving the UE's Application Data from the UDR or by subscribing to notifications of changes to the UEs' Application Data in the UDR. Furthermore, the PCF retrieves the specific Background Data Transfer Policy based on the received Background Data Transfer Reference ID stored as Policy Data Set from the UDR.

When the PCF determines to send the Background Data Transfer Policy information to the UE as part of a URSP rule, the PCF will store the policy in the UDR as part of the UE's Policy Set Entry and will use the associated S-NSSAI and DNN associated with the ASP id stored in the Application Data to store the Background Data Transfer Reference ID in the UE's PDU Session policy control subscription information (see clause 6.2.1.3). The PCF uses local policies to decide if and when the Background Data Transfer Policy information is going to be sent to the UE as Validation Criteria in the RSD part of the URSP rule (see clause 6.6.2.1). The UE uses Validation Criteria to determine whether or not a PDU Session should be established. The Time Window and Location Criteria are not required to be checked again during the lifetime of the PDU Session.

The PCF may, based on operator configuration, trigger the UE Configuration Update procedure when the policy is selected, or the PCF may wait until receiving a notification from the AMF that the UE has entered the Tracking Area or Presence Area where the policy applies, and/or the PCF may wait until the time window when the policy applies is approaching. The UE's support of the Validation Criteria in a URSP rule is optional.

NOTE 5: If a non-supporting UE receives Validation Criteria, it ignores the URSP rule.

When the PDU Session is established, the PCF that serves the PDU session will use the Background Data Transfer Reference ID in the UE's PDU Session policy control subscription information (see clause 6.2.1.3) to retrieve the corresponding background data transfer policy (i.e. Time Window and/or Location Criteria) from the UDR and derives the PCC rules for the background data transfer according to this transfer policy.

NOTE 6: The AF will typically contact the PCF for the individual UEs to request sponsored connectivity for the background data transfer.

NOTE 7: A transfer policy is only valid until the end of its time window. The removal of outdated transfer policies from the UDR is up to implementation.

The PCF may reject corresponding SM Policy Association, as described in clause 4.16.4 of TS 23.502 [3], if Validation condition is not satisfied. And based on this feedback, SMF will reject the PDU session setup.

After successful PDU session setup, PCF may trigger PDU session release when Validation condition is not satisfied.

When the PCF knows, from the NWDAF as described in TS 23.288 [24], that the network performance in the area of interest goes below the criteria set by the operator, the PCF retrieves all the background transfer policies from the UDR, check the BDT policies that are not applicable due to the degradation of the network performance and calculates a list of new candidate BDT policies for the ASP to select. The PCF notifies the ASP on both the BDT policies that is not valid any longer and the candidate BDT policies via NEF if requested by the ASP.

The PCF removes the BDT policy stored in the UDR for the corresponding background data transfer reference ID.

When the AF receives the notification, the AF may select one of the background transfer policies included in the candidate list, and then inform the PCF about the selected background transfer policy. The PCF stores the newly selected background transfer policy into the UDR for the corresponding Background Transfer Reference ID. As a consequence, the PCF identifies the UEs for which the background transfer policy was already applied and updates URSP rules with the new Validation Criteria as described in clause 4.16.12.2 of TS 23.502 [3].

NOTE 8: A PCF can subscribe to notifications on changes in background transfer policy in UDR. Upon reception of such notification the PCF has also to identify the UEs for which the background transfer policy was already applied and update URSP rules with the new Validation Criteria as described in clause 4.16.12.2 of TS 23.502 [3].

*END OF CHANGES*