[SA2#163]NWM questionary for FS_UPEAS_Ph2 - Version 0.0.3

SA2

https://nwm-trial.etsi.org/#/documents/8869

1 Introduction

The present NWM document follows recommendations held in S2-2405527 ”Proposed process ahead of SA2”

To compare principles inherent to the different provided solutions, companies are kindly requested to answer to the following questions for FS_UPEAS_Ph2. The detailed solutions are captured in TR23.700-63. The latest version is 0.3.0.

Please note that when you provide the answer to the questions, it would be benefit if you can also provide more description to justify your answer. But this is not mandatory to provide an answer.

2 Questions for KI#1(UPF Selection)

Description: In solution 4, the SMF may use the following information to enhance the UPF selection logic.

- Subscription information from the UDM/UDR: The SMF may receive subscription information from the UDM, during (or after) the establishment of the PDU session, indicating functionalities that are required and/or desired for the PDU session. For example, subscription information for children might require parental control for the internet DNN/S-NSSAI.
- Policy information received from the PCF: The SMF may receive policy information from the PCF, during (or after) the establishment of the PDU session, indicating functionalities that are required and/or desired for the PDU session. The PCF may be configured with relevant policies e.g. per DNN/S-NSSAI, or per subscriber, group(s) of subscribers, etc. For example, for subscribers of a specific enterprise some functionalities might be required and/or preferred

Feedback Form 1: Q1: Should the UPF selection logic be based on subscription data in UDM/UDR indicating functionalities that are required and/or desired?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: We see UPF selection based on subscriber information as a useful addition.

2 – Nokia Germany

The interim conclusions agreed define explicitly 2 extended UPF functionalities and the operator configurable parameter, as such many extended functionalities can be covered. The UPF selection logic shall be enhanced with input from UDM so that the SMF is not only leveraging configured information. Information from UDM may include required and/or desired extended functionalities. An SMF selects then a UPF supporting all required extended functionalities and the maximum set (which may be none) of desired

functionalities.

3 – Ericsson LM

Additional complexity is not needed. Specifications (see TS 23.501 clause 6.3.3.3) already indicate that SMF can take input from PCF and UDM for UPF selection.

4 – ZTE Corporation

Same as Ericsson. Prefer no further enhancement on subscription and policy for UPF selection.

5 – China Mobile Com. Corporation

We also support of this idea.

6 – ETRI

We agree with Ericsson's opinion. The SMF may consider the following parameter(s) and information for UPF selection in TS23.501 clause 6.3.3.3.

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- UE subscription profile in UDM.

- Local operator policies.

———

If this is insufficient, it needs to be extended for this solution.

7 – HuaWei Technologies Co.

Negative. Using specific DNN, S-NSSAI combination can already support the selection of enhanced UPF. Also, as the UPF can be a I-UPF or PSA UPF, whether this requirement is only to PSA UPF or also applied to I-UPF need be clarified. If still introduced, a too specific/fine granular capability scheme should be avoided.

8 – SK Telecom

YES, required. The UPF are closely related to the traffic handling actions considering the characteristics of the subscription data.

9 – Samsung Electronics Czech

Yes we see that UPF selection logic should be enhanced based on UDM subscription data, otherwise on what basis would the SMF perform selection given that we are including these additional UPF functionalities in the NF profile. Maybe explicit Required/Desired may not be necessary, but still SMF selection logic should be influenced based on received subscription data for these additional functionalities.

10 – VODAFONE Group Plc

The UPF selection already considers policies that can be derived from subscription data. If additions are needed, those should be very well detailed.

Feedback Form 2: Q2: Should the UPF selection logic can be based on SM Policy data in PCF indicating functionalities that are required and/or desired?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: We see UPF selection based on policy information as a useful addition.

2 – Nokia Germany

The interim conclusions agreed define explicitly 2 extended UPF functionalities and the operator configurable parameter, as such many extended functionalities can be covered. The UPF selection logic may be enhanced with input from PCF so that the SMF is not only leveraging configured information. Information from PCF may include required and/or desired extended functionalities. An SMF selects then a UPF supporting all required extended functionalities and the maximum possible set (which may be none) of desired functionalities.

3 – Ericsson LM

As stated for Q1, additional complexity is not needed. Specifications (see TS 23.501 clause 6.3.3.3) already indicate that SMF can take input from PCF and UDM for UPF selection.

4 – ZTE Corporation

Prefer no further enhancement on subscription and policy for UPF selection.

5 – China Mobile Com. Corporation

We think current method already support this approach.

6 – ETRI

Same comments for Q1

7 – HuaWei Technologies Co.

Negative. Using specific DNN, S-NSSAI combination can already support the selection of enhanced UPF. If still introduced, a too specific/fine granular capability scheme should be avoided.

8 – SK Telecom

YES, required. It's same as Q1, the UPF selection based on functionalities of UPF considering SM policy data is required (NAT, DNS sniffing, ..)

9 – Samsung Electronics Czech

Yes (similar to Q1) we see that UPF selection logic should be enhanced based on PCF policies, otherwise on what basis would the SMF perform selection given that we are including these additional UPF functionalities in the NF profile. Maybe explicit Required/Desired may not be necessary, but still SMF selection logic should be influenced based on received policy data for these additional functionalities.

10 – VODAFONE Group Plc

Isn't this already specified??

Solution 6 propose to enhance the UPF selection to base on the status of the supported functionalities(enabled, disabled) in UPF. Question:

Feedback Form 3: Q3: Should the UPF selection logic be based on the status of the supported functionalities(enabled, disabled) in UPF?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: We support using the NF profile of the UPF to provide supported functionalities of the UPF

2 – Nokia Germany

The UPF selection logic is already based on the status of the supported functionalities. The UPF advertises in its profile its supported functionalities. When the status of a supported functionality changes the UPF updates its profile to the NRF with the new status. SMF can subscribe to receive notifications on UPF profile changes. This is existing functionality since 3GPP Rel. 15. Based on the interim conclusions approved extended functionalities shall be added to the UPF profile. Nothing more is needed. The profile update/notification mechanism, as described previously, works then including the newly added extended UPF functionalities.

3 – Ericsson LM

Mechanism exist to take into account UPF supported functionality. Nothing additional is needed.

4 – ZTE Corporation

No need for further information to identify enabled or disabled feature in the UPF profile

5 – China Mobile Com. Corporation

In our understanding, NF profiles can be updated in NRF dynamically, so seems this proposed approach's benefit is not clear.

6 – Qualcomm Incorporated

No. The status of UPF (e.g., enable or disable functionalities) is up to UPF implementation. UPF only need to indicate its current supporting functionalities to NRF/SMF, no additional information is needed.

7 – ETRI

No. We have the same view as CMCC.

8 – HuaWei Technologies Co.

No. And if UPF enables a functionality or disables a functionality, the UPF can directly update its NF profile to add or remove the supported functionality.

9 – SK Telecom

No. In order to consider changes supported functionalities of UPF, a UPF reselection procedure for already established session must be pre-defined.(PSA)

10 – VODAFONE Group Plc

Not needed.

3 Questions for KI#2(Direct subscription)

Group 1: Direct subscription of UPF event: Sol#11, Sol#12, Sol#13

Solution 11 proposes that NEF/NWDAF directly subscribe the UPF for event not associated with particular PDU Session, and the UPF uses SUPIs, GPSIs , Application ID(s), to filter the event exposure. This solution also proposes that NEF/NWDAF can also use the IP address to subscribe directly to the UPF for data collection.

Feedback Form 4: Q4: Should the UPF be enhanced to use SUPIs, GPSIs , Application ID(s) to filter the UPF exposure for event not targeting a purticularparticular PDU session? YES or NO

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: Yes

2 – Nokia Germany

The current status quo is:

Subscription via SMF using Nupf_EventExposure Subscribe, if the target is:

- PDU session(s) of a specific UE or a group of UEs; or

- PDU session(s) of any UE and the subscription includes at least one of the following parameters: AoI, Traffic filtering, BSSID/SSID, Application ID.

The benefits from the proposed extensions are not so clear. Especially for a list of UEs there is already the following:

NOTE 2: In the case of subscription for a list of SUPIs/GPSIs, whether it is more optimal to subscribe via SMF or directly to UPF depends on the size of the SUPI/GPSI range and the number of UPFs.

For the any UE case and when the subscription includes the Application ID looks indeed better to adopt the proposal of Solution #11.

3 – Ericsson LM

Yes. The proposed enhancements reduce signaling and SMF processing logic.

Application Id has been already agreed for Rel-18 in last meeting

4 – ZTE Corporation

The SUPI/GPSI is optional in UPF, and it is unclear how the NF/third party can know whether the UPF has stored the SUPIs/GPSIs in each PDU session context.

5 – China Mobile Com. Corporation

Yes, support Ericsson's explanation.

6 – Qualcomm Incorporated

Yes.

7 – ETRI

Yes

8 – HuaWei Technologies Co.

Not OK with using SUPIs/GPSIs for general UPF event exposure. This solution proposes that the UPF can store subscriptions for SUPIs and GPSIs and activate the reporting when/if a corresponding PDU Session is established, but how the UPF can be aware of the establishment of PDU sessions corresponding to the SUPIs/GPSIs is not clear. Furthermore, there could be a lot of unnecessary information to be maintained as it is not known in advance when and where the PDU Sessions of the user will appear.

The usage of Application ID(s) to filter the UPF exposure for events not targeting a particular PDU Session is already possible with Rel-18. It is not expected to use the Application ID(s) to find the target UPF. So it is unclear what is the new enhancement to be added.

9 – SK Telecom

YES, it is necessary to use the those keys to exposure information related to a 'specific' session.

10 – Samsung Electronics Czech

No, we do not see any benefit from the case of event subscription targeting SUPI(s)/GPSI(s). It is hard to justify to pre-emptively subscribe to all the UPFs beforehand for event subscription even though no PDU Session are established. Also as indicated by Huawei, a lot of unnecessary information need to be

maintained at UPF, even though possibly there wouldn't be no (or very less) PDU Session that would be established in future.

11 – VODAFONE Group Plc

yes

Feedback Form 5: Q5: for data collection, can other consumers than SMF use the user IP address to subscribe directly to UPF? YES or NO

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: No. We should strive to provide a mapping between the IP address and a subscriber identifier. Otherwise, the NAT problem keeps needing to get solved again and again (instead of just getting it solved once)

2 – Nokia Germany

No, due to edge computing cases where the UE IP address might not point to the proper target.

3 – Ericsson LM

Yes. Our assumption is this refers enhancement is for the UE IP address (before NAT). This enhancement reduces subscription signaling.

4 – ZTE Corporation

Yes.

5 – China Mobile Com. Corporation

Yes

6 – Qualcomm Incorporated

No.

7 – vivo Mobile Communication Co.

yes

8 – HuaWei Technologies Co.

Neutral. According to Rel-18 functionality, the UPF can already accept a subscription with a user IP address and thus, it should be feasible to be used by other consumers as well. The restrictions for subscribing via the SMF (as defined in clause 5.8.2.17 of TS 23.501) should however be kept, e.g., for QoS Monitoring subscription need via SMF.

9 – SK Telecom

NO, UE IP is reusable network resource, and there may be real-time synchronization issues, including NAT. Moreover, there is the possibility of exposure information of other sessions that is not intended

10 – Samsung Electronics Czech

Yes, if the UPF is already implementing NAT, we don't see the reason not to directly send the UPF's public IP address (and port) directly to the UPF along with subscribed Event IDs.

Solution 12 proposes that the AF firstly requests a token from NRF (via NEF) and then use this token to subscribe the UPF event via N6 interface. NEF also informs this token to the serving UPF via SMF. SA3 needs to evaluate whether the token can be used for the UPF to verify the AF request via N6.

Solution 13 proposes two cases. The UPF impact in Case A can be concluded in KI#3. In Case B the AF sends the downlink data towards the UPF(with authentication token). The UPF detects and reports an authentication token to the SMF, and the SMF requests the NEF to verify the Authentiction token. Based on the result the SMF subscribes UPF for the Event(s). SA3 needs to discuss the details related to the authentication token check

Feedback Form 6: Q6: Should the UPF event exposure service be subscribed by AF via N6 interface?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: We see no benefit in standardizing "SBI over N6" and too many questions regarding security (e.g. trusted/untrusted, authorization), performance (e.g. need to filter all incoming traffic?) or what protocol to use (some solution proposes to use headers). SBI-over-N6 would need to be jointly evaluated by SA2, SA3 and with support of CT3 as it implies changes in the current paradign in the security architecture and protocol layers

2 – Nokia Germany

Although Solution #12 respects the already established security mechanisms it is still complex and hence subscription to the UPF event exposure service by the AF via the N6 shall not be specified.

3 – Ericsson LM

No. both Solution #12 and solution #13 add too much complexity which does not justify the benefit. We also have concerns about the security of these solutions

4 – ZTE Corporation

No

5 – China Mobile Com. Corporation

Neutral

6 – Qualcomm Incorporated

No. The security issue need to considered by SA3. None of the current solutions shown obvious benefit comparing with existing CP based exposure request.

7 – HuaWei Technologies Co.

No. The procedure is more complicated than indirect subscription to the UPF.

For Sol#12, it is not only the token but the whole subscription information related to the token needs to be pre-configured at the UPF (potentially multiple sets of token + subscription information).

For Sol#13, there would be no gain/difference to the existing subscription via NEF if there is a signaling interaction from UPF up to NEF and back.

8 – SK Telecom

NO, it may increase complexity of UPF and N6 Interface

9 – SK Telecom

NO, it may increase complexity of UPF and N6 Interface

10 – VODAFONE Group Plc

No

11 – Samsung Electronics Czech

Although we see the value of subscribing to UPF directly via N6 as it helps the consumer AF to subscribe and modify the event exposure subscription to serving UPF without needing to perform the subscription via long path (as in Rel-18) again and again, we are okay to not specify the N6 based solutions in this release due to its increased complexity. (i.e. the Case B of Solution#13 and Solution#12).

However as indicated by Rapporteur, the Case A of the Solution#13 re-uses the Header detection based reporting as in solution#1 (thus authentication is based on the same principles) to optimize the procedure to UPF event exposure services via NEF (i.e. via control plane) and hence should be evaluated separately.

Feedback Form 7: Q7: If the answer to Q6 is yes, should the authentication token be verified in UPF, with NEF informing the token to the serving UPF (via SMF) beforehand (Sol#12) ?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: Security should in no case be ignored. this is an issue for SA3 to solve.

2 – Nokia Germany

The answer to Q6 is NO. However, 5GC SBA principles describe that the NF producer verifies an autho-

rization token (see Clause 6.7.3 of 3GPP TS 29.500). In Solution #13 the term "authentication" token is used than "authorization" token. If it is just a typo in Solution #13 and "authorization" token is meant instead of "authentication" token, as written 5GC specs specify who verifies the "authorization" token. If "authentication" is not a typo then authorization is not described at all in Solution #13 which is a severe security thread.

3 – Ericsson LM

Our answer to Q6 is No.

4 – ZTE Corporation

Not applicable since our answer to Q6 is No

5 – China Mobile Com. Corporation

The verification in UPF is needed.

6 – HuaWei Technologies Co.

N/A, our answer to Q6 is No.

7 – Samsung Electronics Czech

Inline with the current specs (29.500 and 33.501), in this case **NRF** is the OAuth access token generator, **UPF** is the producer in and **AF** is the consumer. If the particular token discussed in Solution#12, is the OAuth access token, we do not see why (and how) does the **"NEF"** need to inform that token to the **UPF.**

Feedback Form 8: Q8: If the answer to Q6 is yes, should the authentication token be verified in NEF, with UPF informing the token to NEF (via SMF) at the time of receiving AF request (Sol#13)

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: Security should in no case be ignored. this is an issue for SA3 to solve.

2 – Nokia Germany

The answer to Q6 is NO. Solution #13 introduces various security issues and complexity for the AF for a minimal benefit. There is AF impact/complexity due to the proposed solution and especially for untrusted AFs the operator does not control them. AFs in general do not care about 5GC internals, UPF changes etc. to integrate with 5GC. Coming to the security implications: If the subscription is for any UE then the UPFs serving a DNN/S-NSSAI need to be specified and the proposed solution does not do so. If the subscription is for specific UE(s) then the relevant IP address(es) is needed and exposing via "Case A" the UPF ID and the UE's private address to the AF is a security threat. Same applies to "Case B". The use of a generic token does not resolve the security threat mentioned rather introduces more security threats:

- The token is referred as authentication token. What is the encryption applicable for this token and how is this negotiated between the AF and the NEF?

- How does NEF know when issuing the authentication token that the AF requesting for this is not a fake/compromised AF?
- How authorization for consuming the UPF event exposure service is performed?

So as already mentioned the answer to Q6 is NO, Solution #13 for a minimal benefit faces many issues and introduces AF complexity.

3 – Ericsson LM

Our answer to Q6 is No.

4 – ZTE Corporation

Not applicable since our answer to Q6 is No

5 – HuaWei Technologies Co.

N/A, our answer to Q6 is No.

Group 2: New information exposured by UPF: Sol#5, Sol#7, Sol#9

Solution 5 proposes that the TSN AF or TSCTSF subscribes the UPF event exposure service for TSC management or time synchronization and deterministic networking between TSN AF or TSCTSF and NW-TT via Nupf_EventExposure_Subscribe service operation. The impact of this procedure to the existing procedures of TSN Bridge information exchange and management is FFS

Solution 7 proposes that the UPF event exposure service is further enhanced to provide the NATed UE public IP address and Port, based on the private UE address (UE IP address assigned by 5GC for the PDU session). The main use case is data collection, it is FFS if the IP connection used between AF and UE in TS 26.531 is short lived or if it is long lived

Solution 9 proposes that the UPF event exposure service is further enhanced to provide DNAI mapping information(EAS address information (i.e. IP address(es), EAS IP range(s) or FQDN(s)) and the associated DNAI) to NEF. The AF requests the DNAI mapping information from NEF per existing mechanism.

Feedback Form 9: Q9: Should TSN AF or TSCTSF directly subscribe the UPF event exposure service?

1 – Nokia Germany

There is the following:

Editor's Note: The impact of this procedure to the existing procedures of TSN Bridge information exchange and management is FFS.

It is hard to proceed without resolving this EN.

2 – Ericsson LM

No. We do not think this is justified. The significant signaling savings considering existing procedure and all other interactions needed between TSN AF / TSCTSF and 5GS have not been described.

It also deviates from principle followed in Rel-18 where each event has one single subscription path into UPF (SBI or N4).

3 – ZTE Corporation

Yes. We see benefit that TSN AF or TSCTSF directly subscribe the UPF event exposure service

4 – China Mobile Com. Corporation

Support this.

5 – Qualcomm Incorporated

No. The requirement and the impact to TSN management are not clearly specified.

6 – ETRI

Yes

This solution has benefits for optimizing the existing signaling path. It assumes that TSC management information including UMIC/PMIC is transparent for SMF and PCF. In Rel-18, TSN AF or TSCTSF indirectly subscribes to UPF event exposure service for TSC management information via PCF/SMF and UPF/NW-TT notifies event results directly and/or indirectly by request of TSNAF or TSCTSF (implementation dependent).

As similar to the notification procedure of Rel-18. TSN AF or TSCTSF can subscribe to the TSC event directly or indirectly (existing method) by the operator's implementation in Rel-19(single subscription path).

Therefore, we think the impact in the Editor's Note is only an implementation issue done by the TSNAF or TSCTSF. More details on direct subscriptions can be left for the normative phase.

7 – VODAFONE Group Plc

No. Th impacts are unclear at this point in time.

8 – Samsung Electronics Czech

Neutral

Feedback Form 10: Q10: Should UPF event exposure service be enhanced to provide the the NATed UE public IP address and Port, based on the private UE address (UE IP address assigned by 5GC for the PDU session)?

1 – T-Mobile Austria GmbH

[Deutsche Telekom]: Yes

2 – Nokia Germany

Yes, the solution could be accepted with the following modifications:

- The remote IP address is mandatory input to avoid exposing the full NAT mapping for a UE (avoiding privacy concern as already identified in a relevant NOTE).
- The new service is of type Subscribe/Notify to take care of changes in the mapping.
- NWDAF might also subscribe to the SMF to receive session release notifications.

3 – Ericsson LM

Yes. The enhancement proposed solves a Rel-18 gap.

4 – ZTE Corporation

Yes

5 – China Mobile Com. Corporation

Support it.

6 – Qualcomm Incorporated

No. The mapping with NATed IP address may subject to change.

7 – vivo Mobile Communication Co.

yes, this question has been discussed so long from eNA, and support this mechanism in R19 is a good way forward to solve the problem,

8 – HuaWei Technologies Co.

Yes

9 – SK Telecom

YES, association management between the UE ID and the IP (NATed) that communicates with AF is required

10 – VODAFONE Group Plc Yes. it resolves a lengthy debate
11 – Samsung Electronics Czech Yes, with changing it to Subscribe/Notify (as indicated by Nokia).

Feedback Form 11: Q11: Should UPF event exposure service be enhanced to provide the DNAI mapping information(EAS address information (i.e. IP address(es), EAS IP range(s) or FQDN(s)) and the associated DNAI) to NEF?

1 – Nokia Germany No, the configuration required in all the local UPFs and the relevant signalling does not justify the solution.
2 – Ericsson LM No. We do not think this proposed alternative is better than the solution currently specified.
3 – ZTE Corporation Yes. The proposed solution avoid configuration effort in the UDR when DNAI mapping information is changed, e.g. the assoicated EAS IP ranges are changed.
4 – ETRI Yes. We have the same view as ZTE.
5 – HuaWei Technologies Co. No, UPF does not have DNAI information and all the EAS information would need to be provided to the UPF. Hence, the configuration work does not change, but the additional efforts are necessary to provide this information to UPF.

Group 3: UPF path change: Sol#8, Sol#10

Solution 8 proposes that source UPF sends the collected data and subscription termination indication(new) to the consumer based on the last notification indication(new) from SMF.

Solution 10 proposes that the SMF provides the Target UPF information(new) to the source UPF and the source UPF sends the Target UPF information(new) to the consumer, then the cosumer resubscribe the event to the Target UPF.

Feedback Form 12: Q12: Should the UPF event exposure service be enhanced to provide the subscription termination indication to the consumer, based on the last notification indication from SMF?

1 – Nokia Germany

No, what is accepted from Solution #8 is for periodic reports to send to the Consumer any collected data in between the last notification and the instance of the UPF change (time interval between the last notification and the instance of the UPF change is assumed smaller than the period of periodic reporting).

2 – ZTE Corporation

No, the subscription termination indication is not needed. The consumer can subscribe the UPF event applicable for a PDU session via SMF.

3 – Ericsson LM

The value of the proposed enhancement is unclear. While SMF manages the PDU Session, it can manage subscription and un-subscription towards UPFs involved in UP Path change. No need for AF intervention.

It can be specified that UPF always sends a last report when data collection for the IP address terminates. The report may be extended to include an indication of last report to assist interpretation of the information. But we see no value in additional complexity as proposed in the solution.

4 – HuaWei Technologies Co.

Support. The consumer needs to be aware of whether the subscription is terminated, and determine to unsubscribe or update the previously subscribed UPF events.

The source UPF or SMF can send the subscription termination indication to the consumer. The source UPF can optionally send the collected data to the consumer, when the last notification indication from SMF indicates that the source UPF sends the collected data to the consumer and the source UPF has collected some data but has not sent the data to the consumer due to the reason such as that the reporting time of the periodic report has not reached.

5 – SK Telecom

Neutral, necessary information, but requires a more explicit notification of termination (such as a separate notification for termination)

6 – Samsung Electronics Czech

No, we think that since the subscription is already via SMF, SMF can itself manage the subscription (if needed to the target UPF). Also there already exist an event of ”UP path change” from SMF, and the consumer can simply subscribe to that event from the SMF, thus separate subscription termination indication from SMF is not needed.

Feedback Form 13: Q13: Should the UPF event exposure service be enhanced to provide the Target UPF information to the consumer when the UPF is relocated?

1 – Nokia Germany

No, the solution violates authorization mechanisms. It also forces the consumer to handle UPF changes when this is resolved in Rel. 18. Last but not least it is awkward:

- To use the N4 interface as kind of management interface to pass UPF event exposure service information.
- To expose target UPF information to the source UPF.

2 – Ericsson LM

No.

We do not think this is needed.

For the ”Any_UE” case, UPF reports should be provided for PDU Sessions meeting the criteria in targeted UPF. For a Group or an specific SUPI, AF can send the subscription indirectly via SMF and SMF handles the subscription updates towards UPFs . Or, as in solution #11 (if agreed), directly to all UPFs that satisfy the other filters (DNN, S-NSSAI). There is not need of AF active involvement at UP path change.

3 – ZTE Corporation

No, the existing SMF notification is sufficient to report the UPF change.

4 – Qualcomm Incorporated

No.

5 – HuaWei Technologies Co.

No, compared with the existing re-subscription procedure, the informing of target UPF information is not helpful. To continue the subscription of the consumer, it could be done by letting the SMF instruct the target UPF according to the subscription, i.e., re-subscription.

6 – Samsung Electronics Czech

We think the value of this solution is in the cases when the Consumer directly subscribes to the UPF (i.e. when SMF was not involved). The consumer NF (which is already assumed to be Trusted AF/NEF/N-WDAF etc.) need not perform the discovery of serving UPF again and again (Sol#11 does not cater to the serving UPF), in order to subscribe to the new UPF which is serving the UE’s PDU Session. The authorization mechanisms is based on the existing specs.

4 Questions for KI#3(Header detection)

There is only one solution for this key issue. In solution 1, there are two options for the AF to indicate whether direct reporting is required(i.e. using UPF exposure service)

- Option 1: Report Correlation ID and UPF event consumer notification URI values. The AF provides these attributes to indicate its preference to receive Session Reports directly from the UPF Exposure Service (see option 1 in Section 6.1.2.2.23) instead of default N4 based reporting described in Section 6.1.2.2.1
- Option 2: the AF provides Notification Target Address (+ Notification Correlation ID) attributes to request to receive Session Reports, and direct indication to request that they are sent directly with UPF Exposure Service.

And the following EN:

- Editor's Note: Only one of the above options, with its associated procedures in the following chapters, will be taken for conclusion.

Feedback Form 14: Q14: Can option 1 and 2 be redrafted to converge? If the answer is yes please provide details.

1 – Nokia Germany

The important point is to conclude that:

- Direct reporting from the UPF Event Exposure service to the AF is the only reporting method specified to avoid overwhelming the control plane.
- If SMF needs to receive reports, too; there is no reason to impact the N4, rather SMF might receive reports via SBI via notifications from the UPF Event Exposure service.

2 – Ericsson LM

In our view, the following principles could be common to the two options:

- The AF Header handling request may include subscription to notifications. In this case, the AF request
  - includes information of Notification end point, namely
    - Address where notifications should be sent
    - Some form of correlation ID which is included in the report to AF and consumer can use to correlate request and report when received.

    (The above is needed independently on whether SMF or UPF will report to AF)
  - indicates whether reports shall be sent to AF by UPF or by SMF.

We can agree to these principles. Then, whether new or existing IEs need to be defined in the API for the above can be left for normative phase. The two options differ though with regards to PCF/SMF/UPF interactions. For these interactions see our comments to Q15 and Q16.

3 – ZTE Corporation

No, we prefer to adopt option 2 as conclusion.

4 – China Mobile Com. Corporation

We think option2 is enough.

5 – HuaWei Technologies Co.

No. Probably not possible to converge due to difference in concepts.

6 – Samsung Electronics Czech

No, We are okay with Option 2 as it reuses existing concepts.

7 – VODAFONE Group Plc

There are some commonalities that can be captured as principles for both options. The main differenc is at the level of using SBI or N4 to instruct UPF direct reporting is requested by the AF, and convergence as such is not be possible.

Feedback Form 15: Q15: If the answer to Q14 is no, should option 1 be selected for normative work?

1 – Ericsson LM

[Team]

Partially, only the principles we have listed in Q14. Not for the PCF/SMF/UPF interactions

2 – Ericsson LM

Forget previous post. It was posted unfinished.

Partially, only the principles we have listed in Q14. Not for the PCF/SMF/UPF interactions.

SMF provides rules to UPF to convey the header handling instructions. The subscription to notification should be provided over N4 in this update (as for QoS Monitoring or TSN), as proposed option 2.

Parallel SBI subscription is not justified, it is complicating the solution and the logic in UPF.

3 – ZTE Corporation

No, in our view option 2 is existing mechanism.

4 – China Mobile Com. Corporation

No, option2 is enough.

5 – HuaWei Technologies Co.

No

6 – Samsung Electronics Czech

No

Feedback Form 16: Q16: If the answer to Q13 is no, should option 2 be selected for normative work?

1 – Ericsson LM

Yes, to big extent.

Besides the principles listed in our answer to Q14, the following principles in Option 2 are proposed to be agreed:

- The subscription to Nupf Event Exposure notification is included in the N4 Rules.
- It is possible to request UPF to send the report over N4 and/or in Nupf_Event Exposure_Notify.
- Either SMF or UPF reports to AF
- PCF can request to get the reports, and in this case, SMF sends to PCF the report that it receives over N4.

Then SRR is probably a better option than URR to subscribe to the event. It would harmonize this solution with other N4 subscribed events and reuse what has been defined already for those. Whether using SRR or URR could be left for decision during normative phase.

2 – ZTE Corporation

Yes

3 – China Mobile Com. Corporation

Yes, option2 is preferred.

4 – HuaWei Technologies Co.

Yes, we should reuse existing mechanisms as much as possible.

5 – Samsung Electronics Czech

We are okay with Option 2 as it reuses existing concepts.

5 Proposal on additional question

Feedback Form 17: Please indicates proposal on new questions to be discussed

6 NWM Discussion Summary

Table 1:

Q1: Should the UPF selection logic be based on subscription data in UDM/UDR indicating functionalities that are required and/or desired?			
1 – T-Mobile Austria GmbH	Yes		
2 – Nokia Germany	Yes		
3 – Ericsson LM		No	
4 – ZTE Corporation		No	
5 – China Mobile Com. Corporation	Yes		
6 – ETRI		No	
7 – HuaWei Technologies Co.		No	
8 – SK Telecom	Yes		
9 – Samsung Electronics Czech	Yes		
10 – VODAFONE Group Plc		No	
Rapporteur Proposal:	Add new specific parameters in UDM for UPF selection Potential SoH		

Table 2:

Q2: Should the UPF selection logic can be based on SM Policy data in PCF indicating functionalities that are required and/or desired?			
1 – T-Mobile Austria GmbH	Yes		
2 – Nokia Germany	Yes		
3 – Ericsson LM		No	
4 – ZTE Corporation		No	
5 – China Mobile Com. Corporation		No	
6 – ETRI		No	
7 – HuaWei Technologies Co.		No	
8 – SK Telecom	Yes		
9 – Samsung Electronics Czech	Yes		
10 – VODAFONE Group Plc		No	
Rapporteur Proposal:	PCF policy is not enhanced for UPF selection		

Table 3:

Q3: Should the UPF selection logic be based on the status of the supported functionalities(enabled, disabled) in UPF? indicating functionalities that are required and/or desired?			
1 – T-Mobile Austria GmbH			We support using the NF profile of the UPF to provide supported functionalities of the UPF
2 – Nokia Germany		No	
3 – Ericsson LM		No	
4 – ZTE Corporation		No	
5 – China Mobile Com. Corporation		No	
6 – Qualcomm Incorporated		No	
7 – ETRI		No	
8 – HuaWei Technologies Co.		No	
9 – SK Telecom		No	
10 – VODAFONE Group Plc		No	
Rapporteur Proposal:	No further enhancement on UPF profile to include status of the supported functionalities(enabled, disabled) in UPF		

Table 4:

Q4: Should the UPF be enhanced to use SUPIs, GPSIs , Application ID(s) to filter the UPF exposure for event not targeting a purticularpar-ticular PDU session? YES or NO			
1 – T-Mobile Austria GmbH	Yes		
2 – Nokia Germany	Yes for App ID	No for SUPIs/GPSIs	
3 – Ericsson LM	Yes, APP ID has been supported in R18		
4 – ZTE Corporation		No for SUPIs/GPSIs	
5 – China Mobile Com. Corporation	Yes		
6 – Qualcomm Incorpo-rated	Yes		
7 – ETRI	Yes		
8 – HuaWei Technolo-gies Co.	Yes, APP ID has been supported in R18	No for SUPIs/GPSIs	
9 – SK Telecom	Yes		
10 – Samsung Electron-ics Czech		No for SUPIs/GPSIs	
11 – VODAFONE Group Plc	Yes		
Rapporteur Proposal:	APP ID has been sup-ported in R18. There is no further enhancement in R19. SUPI/GPSI can be used by the UPF to filter the event not targeting a par-ticular PDU session.A Potential SoH		

https://nwm-trial.etsi.org/#/documents/8869

Table 5:

Q5: for data collection, can other consumers than SMF use the user IP address to subscribe directly to UPF? YES or NO			
1 – T-Mobile Austria GmbH		No	
2 – Nokia Germany		No	
3 – Ericsson LM	Yes		
4 – ZTE Corporation	Yes		
5 – China Mobile Com. Corporation	Yes		
6 – Qualcomm Incorporated		No	
7 – vivo Mobile Communication Co.	Yes		
8 – HuaWei Technologies Co.			Neutral
9 – SK Telecom		No	
10 – Samsung Electronics Czech	Yes		
11 – VODAFONE Group Plc			
Rapporteur Proposal:	Other consumers(i.e. NEF/NWDAF) can use IP address to subscribe directly to UPF. NOTE: The restrictions for subscribing via the SMF (as defined in clause 5.8.2.17 of TS 23.501) should be kept		

Table 6:

Q6: Should the UPF event exposure service be subscribed by AF via N6 interface?			
1 – T-Mobile Austria GmbH		No	
2 – Nokia Germany		No	
3 – Ericsson LM		No	
4 – ZTE Corporation		No	
5 – China Mobile Com. Corporation			Neutral
6 – Qualcomm Incorporated		No	
7 – HuaWei Technologies Co.		No	
8 – SK Telecom		No	
9 – VODAFONE Group Plc		No	
10 – Samsung Electronics Czech		No	
Rapporteur Proposal:	AF shall not subscribe UPF event via N6 interface		

Table 7:

Q7: If the answer to Q6 is yes, should the authentication token be verified in UPF, with NEF informing the token to the serving UPF (via SMF) beforehand (Sol#12) ?	
Rapporteur Proposal:	AF shall not subscribe UPF event via N6 interface

Q8: If the answer to Q6 is yes, should the authentication token be verified in NEF, with UPF informing the token to NEF (via SMF) at the time of receiving AF request (Sol#13)	
Rapporteur Proposal:	AF shall not subscribe UPF event via N6 interface

Table 8:

Q9: Should TSN AF or TSCTSF directly subscribe the UPF event exposure service			
1 – Nokia Germany		No	
2 – Ericsson LM		No	
3 – ZTE Corporation	Yes		
4 – China Mobile Com. Corporation	Yes		
5 – Qualcomm Incorporated		No	
6 – ETRI	Yes		
7 – VODAFONE Group Plc		No	
8 – Samsung Electronics Czech			Neutral
Rapporteur Proposal:	TSN AF or TSCTSF should not directly subscribe the UPF event exposure service Potential SoH		

Table 9:

Q10: Should UPF event exposure service be enhanced to provide the NATed UE public IP address and Port, based on the private UE address (UE IP address assigned by 5GC for the PDU session)?			
1 – T-Mobile Austria GmbH	Yes		
2 – Nokia Germany	Yes		
3 – Ericsson LM	Yes		
4 – ZTE Corporation	Yes		
5 – China Mobile Com. Corporation	Yes		
6 – Qualcomm Incorporated		No	
7 – vivo Mobile Communication Co	Yes		
8 – HuaWei Technologies Co.	Yes		
9 – SK Telecom	Yes		
10 – VODAFONE Group Plc	Yes		
11 – Samsung Electronics Czech	Yes		
Rapporteur Proposal:	UPF event exposure service be enhanced to provide the NATed UE public IP address and Port, based on the private UE address		

Table 10:

Q11: Should UPF event exposure service be enhanced to provide the DNAI mapping information(EAS address information (i.e. IP address(es), EAS IP range(s) or FQDN(s)) and the associated DNAI) to NEF?			
1 – Nokia Germany		No	
2 – Ericsson LM		No	
3 – ZTE Corporation	Yes		
4 – ETRI	Yes		
5 – HuaWei Technologies Co.		No	
Rapporteur Proposal:	UPF event exposure service is not enhanced to include the DNAI mapping information.		

Table 11:

Q12: Should the UPF event exposure service be enhanced to provide the subscription termination indication to the consumer, based on the last notification indication from SMF?			
1 – Nokia Germany		No	
2 – ZTE Corporation		No	
3 – Ericsson LM		No	
4 – HuaWei Technologies Co.	Yes		

5 – SK Telecom			Neutral
6 – Samsung Electronics Czech		No	
Rapporteur Proposal:	The UPF event exposure is not enhanced to provide the subscription termination indication to consumer		

Table 12:

Q13: Should the UPF event exposure service be enhanced to provide the Target UPF information to the consumer when the UPF is relocated?			
1 – Nokia Germany		No	
2 – Ericsson LM		No	
3 – ZTE Corporation		No	
4– Qualcomm Incorporated		No	
5 – HuaWei Technologies Co.		No	
6 – Samsung Electronics Czech	Yes		
Rapporteur Proposal:	The UPF event exposure is not enhanced to provide the Target UPF information during UPF relocation		

Table 13:

Q14: Can option 1 and 2 be redrafted to converge? If the answer is yes please provide details			
1 – Nokia Germany			Use only the UPF Event Exposure service to report to both SMF and AF
2 – Ericsson LM			There are common principles
3 – ZTE Corporation		No	
4 – China Mobile Com. Corporation		No	
5 – HuaWei Technologies Co.		No	
6 – Samsung Electronics Czech		No	
7 – VODAFONE Group Plc		No	
Rapporteur Proposal:	Option 1 is not selected for normative work.		

Table 14:

Q16: If the answer to Q13 is no, should option 2 be selected for normative work?			
1 – Ericsson LM	Yes		
2 – ZTE Corporation	Yes		
3 – China Mobile Com. Corporation	Yes		

4 – HuaWei Technologies Co.	Yes		
5 – Samsung Electronics Czech	Yes		
Rapporteur Proposal:	Option 2 is selected as part of conclusion of KI#3		