**Pre SA2#143E e-meeting Email Discussion**

**Source: <Jinguo Zhu/ZTE>**

**Title: <Email discussion on FS\_eNS\_Ph2>**

# 1. Issues for FS\_eNS\_Ph2

## 1.1 Key Issue #3: limitation of data rate per network slice in UL and DL per UE

### 1.1.1 Issue Description

For key issue 3 we have categorized the solutions into 3 categories

- Category A1: Those enforcing the Slice-MBR in the UPF, in CN i.e. solution #13.

- Category A2: Enforcing SMBR in the RAN and also admitting GFBR aggregate for the slice only up to the SMBR at the admission control time in the RAN, i.e. solution #22,

- Category B: Those ensuring that the Slice-MBR limits the aggregated MBR and GBR for QoS flows of established PDU sessions and related QoS flows, i.e. solution #20, #21 and #37. Enforcement is done using the existing QoS parameter

### 1.1.2 Companies View

Question 1) Whether UPF based solution (Category A1) should be supported for KI#3。

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| Company Name  | Company View(Yes/No) | Notes(Justifications) |
| ZTE | No | RAN can enforce the UE-AMBR. The enforcement of Slice-MBR is similar as enforcement of UE-MFBR, therefore we prefer RAN based solution. |
| **China Mobile** | No |  |
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Question 2) Whether RAN based solution (Category A2) should be supported for KI#3:

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| Company Name  | Company View(Yes/No)  | Notes(Justifications) |
| ZTE | YES | RAN can enforce the UE-AMBR. The enforcement of Slice-MBR is similar as enforcement of UE-MFBR, therefore we prefer RAN based solution. |
| **China Mobile** | Yes | RAN can enforce more precise SMBR. |
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Question 3) Whether PCF based solution (Category B) should be supported for KI#3:

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| Company Name  | Company View(Yes/No) / (Option A/Option B) | Notes(Justifications) |
| ZTE | No | RAN can enforce the UE-AMBR. The enforcement of Slice-MBR is similar as enforcement of UE-MFBR, therefore we prefer RAN based solution.PCF based solution cannot be accurate to enforce the Slice-MBR.. |
| **China Mobile** | Yes only if Q2 can not be supported by RAN | A method to control the SMBR is needed even if not so precise. |
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### 1.1.3 Summary

Editor’s Note: This clause should contain the brief summary of companies view e.g. n# of companies prefer to go with option A vs. m# of companies prefer to go with option B.

### 1.1.4 Proposed Way Forward

Editor’s Note: This clause should contain propose a way forward. For e.g. Given that majority of companies prefer to go with option A, it is proposed that Option A is agreed as way forward.

## 1.2 Key Issue #5: Dynamic adjustment to meet the limitation of data rate per network slice in UL and DL

### 1.2.1 Issue Description

For key issue 5 we have categorized the solutions into 3 categories

- Category A with enforcement of Slice max bit rate for each UE in RAN (#14,#25).

- Category B with enforcement of Slice max bit rate in control plan function to control that the accumulate bit rate for all PDU sessions within the Slice do not exceed the Slice max bit rate.(#12,#18, #19, #20, #24).

- Category C with enforcement of slice max bit rate in the user plane by distributing a quota to UPF for enforcement.(#16).

### 1.2.2 Companies View

Question 1) Whether RAN based solution (Category A) should be supported for KI#5:

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| --- | --- | --- |
| Company Name  | Company View(Yes/No) | Notes(Justifications)If Yes please identify which solutions are prefered |
| ZTE | YES | RAN based solution can provide accurate bitrate enforcement for both UL and DL traffic |
| **China Mobile** | Yes |  |
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Question 2) Whether PCF based solution (Category B) should be supported for KI#5:

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| Company Name  | Company View(Yes/No) | Notes(Justifications)If Yes please identify which solutions are prefered |
| ZTE | No | PCF based solution cannot be accurate to enforce the date rate per slice. |
| **China Mobile** | Yes if the RAN based solution can not be supported |  |
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Question 3) Whether UPF based solution (Category C) should be supported for KI#5:

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| Company Name  | Company View(Yes/No) | Notes(Justifications)If Yes please identify which solutions are prefered |
| ZTE | No | UPF based solution can provide accurate enforcement of DL date rate per slice. However the UL data rate enforcement may not be accurate. |
| **China Mobile** | Yes | UPF based solution is simple for core network control. |
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### 1.2.3 Summary

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### 1.2.4 Proposed Way Forward

Editor’s Note: This clause should contain propose a way forward. For e.g. Given that majority of companies prefer to go with option A, it is proposed that Option A is agreed as way forward.

## 1.3 Key Issue #6: Constraints on simultaneous use of the network slice

### 1.3.1 Issue Description

For this key issue several solutions(#26,#28,#39) propose that UE is provided with a new rejection cause value of the S-NSSAI, to indicate that it is mutually exclusive to one or more of the S-NSSAIs in the Allowed NSSAI.

Serveral solutions(#27,#28, #41,#42) proposes that the UE is provided with network slice incompatible information per slice so the UE can efficiently use them to determine the Requested NSSAI. The network slice incompatible information per slice is provided together with Configured NSSAI or together with the Allowed NSSAI

Solution#40 proposes that the UE is provided with network slice incomptible information per SUPI/GPSI.

Some solutions proposes that the slice incompatible information is determined based on SLA, or on UE subscription. There is need to decide how this slice incompatible information is determined.

### 1.3.2 Companies View

Question 1) In addition to the current Rel-15/16 support in the network,whether the UE should additionally be provided with a rejection cause value of the S-NSSAI, to indicate that it is mutually exclusive to the Allowed NSSAI?

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| Company Name  | Company View(Yes/No) | Notes(Justifications) |
| ZTE | Yes | We think it is benefit to notify the UE that the slice is incompatible with the Allowed NSSAI.This is minimum optimization which can be achieved for KI#6 |
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Question 2) In addition to the current Rel-15/16 support in the network, whether the UE should be additionally provided with network slice incompatible information so the UE can efficiently use them to determine the Requested NSSAI. If the answer is YES, please indicate how it is done

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| Company Name  | Company View(Yes/No) | Notes(Justifications)If the answer is YES, please provide whether the network slice incompatible information is provided together with the Configured NSSAI, or together with the Allowed NSSAI, or per SUPI/GPSI |
| ZTE | NO | The slice incompatible information is deployment scenarios and may vary from different areas in the network. For example in one area the AMF supports two slices and in other area the AMF supports three slices. The UE should not be bothered with such network deployment scenarios. |
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Question 3): How do the home and serving networks determine the network slice incomptible information, Option A) based on SLA; Option B) based on UE subscription; C) based on both SLA and UE subscription

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| Company Name  | Company View(Option A/Option B/Option C) | Notes(Justifications) |
| ZTE | Option A | In our view there is no scenario that the slice incompatible is different per UE basis. Operators/NGMN need to provide more background information if there is real need. |
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### 1.3.3 Summary

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### 1.3.4 Proposed Way Forward

Editor’s Note: This clause should contain propose a way forward. For e.g. Given that majority of companies prefer to go with option A, it is proposed that Option A is agreed as way forward.

## 1.4 Key Issue #7: Support of 5GC assisted cell selection to access network slice

### 1.4.1 Issue Description

For this key issue several UE based solutions(#29,#30) propose that UE is provided with frequency band information per network slice in the Configured NSSAI so the UE can efficiently select proper cell before access the network.

For network based solutions, sol#44 has been supported in Rel-16 and has no impact on the system. But whether it is sufficient for KI#7 depends on RAN WG feedback.

For other network based solution, Sol#17 and Sol#46 propose to steer the UE to prefered frequency band during the Registration procedure, and Sol#31 proposes to steer the UE to prefered frequency band UE during the PDU Session procedure. Sol#45 propose to generate Allowed NSSAI by considering the UE radio capability.

### 1.4.2 Companies View

Question 1) Whether the UE based solutions should be supported for KI#7:

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| Company Name  | Company View(Yes/No) | Notes(Justifications)If Yes please identify which solutions are prefered |
| ZTE | No. | The frequency band of the slice may be useful for the cell selection. However the core network should not be bothered to configure the frequency band information. If RAN2 confirms that the slice is homogeniasly supported within the TA then existing mechanism is enough for this key issue(sol#44). |
| **China Mobile** | Yes | UE based solution can help the band selection for S-NSSAI more efficiently. |
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Question 2) Whether the network based solution(#17, #31,#45,#46) should be supported for KI#7

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| Company Name  | Company View(Yes/No) | Notes(Justifications)If Yes please identify which solutions are prefered |
| ZTE | YES | If RAN2 confirms that the slice is homogeniasly supported within the TA then existing mechanism is enough for this key issue (sol#44).However solution#17 is one minimum optimization that can be agreed. If the requested NSSAI is not supported within the current TA, this solution can redirect the UE to correct cells in another TA. |
| **China Mobile** | NO | UE based is enough. |
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### 1.4.3 Summary

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### 1.4.4 Proposed Way Forward

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