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| 3GPP TR 23.700-45 V0.2.0 (2024-03) | |
| Technical Report | |
| 3rd Generation Partnership Project;  Technical Specification Group Services and System Aspects;  Study on System aspects of 5G NR Femto  (Release 19) | |
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# Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document will study and identify potential enhancements for supporting 5G NR Femto deployment. The study will investigate potential enhancements in the following areas:

- How to enable interworking between CAG and CSG cells.

- Study whether and how to support enabling the provisioning of subscribers allowed to access CAG cell and to manage access control by the CAG owner or an authorized administrator.

NOTE 1: Based on RAN3 outcome, the overall architecture and enable the required functional and procedural changes can be enhanced for supporting 5G NR Femto deployment during normative work.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G system; Stage 2".

[4] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

# 3 Definitions of terms and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**example:** text used to clarify abstract rules by applying them literally.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

<ABBREVIATION> <Expansion>

# 4 Architectural Assumptions and Requirements

## 4.1 Architectural Assumptions

The architecture for support of 5G NR Femto shall be based on the following architectural assumptions:

- the 5GS defined as part of Rel-18 is used as basis for further potential enhancements;

- the need for potential architecture enhancements for supporting 5G NR Femto deployments depends on the outcome of RAN WG3 study;

- It is expected that MME, E-UTRAN and NG-RAN impacts are avoided;

- It is assumed that the existing CAG concept defined for PNI-NPN is re-used for Femto access control without impacts to PNI-NPN.

## 4.2 Architectural Requirements

The solutions should build on 5GS architectural principles as defined in TS 23.501 [2].

# 5 Key Issues

## 5.1 Key Issue #1: Support of UE move between CAG cell of 5G Femto and CSG cell

### 5.1.1 General description

This key issue investigates any needed enhancements to support the UE moving between CAG cell of 5G Femto and CSG cell.

The KI should cover:

- The mobility scenarios to be studied for the UE move (e.g. CSG cell to CAG cell of 5G Femto, vice versa).

- Whether and how control signalling procedures are enhanced to support the mobility scenarios.

NOTE 1: This Key Issue assumes that the existing CAG concept defined for PNI-NPN is re-used for access control when a UE wants to access a 5G Femto cell without impacts to PNI-NPN.

NOTE 2: This Key Issue expects that solutions avoid impacts on EPC (e.g., MME), E-UTRAN and NG-RAN.

Editor's note: It is FFS if idle mode mobility scenario needs to be considered.

## 5.2 Key Issue #2: Enabling provisioning of subscribers allowed to access CAG cell and managing access control by the CAG owner or an authorized administrator

### 5.2.1 Description

The 5G NR Femto aims to re-use the existing CAG mechanism defined for PNI-NPN for access control. In order to add flexibility to the 5G NR Femto, the owner of 5G NR Femto needs to be able to control which UE(s) can access to the 5G NR Femto.

NOTE 1: Ownership of the 5G NR Femto (or CAG or both) concept and a mechanism will be defined in coordination with SA WG3.

This key issue aims to address the following aspects:

- How to enable the CAG owner or an authorized administrator to provision/update CAG information to the network for 5G Femto access control. The provisioning/updating of CAG info to the network that 5G Femto serves and the network that the UE has subscription will be considered.

This key issue will consider the scenario of allowing the access to a CAG cell in the home and visited network.

NOTE 2: It is assumed that the existing CAG concept defined for PNI-NPN is re-used for Femto access control without impacts to PNI-NPN.

NOTE 3: Ownership of the 5G NR Femto (or CAG or both) concept and a mechanism will be defined in coordination with SA WG3.

# 6 Solutions

## 6.0 Mapping of Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |  |
| --- | --- | --- |
|  | Key Issues | |
| Solutions | <Key Issue #1> | <Key Issue #2> |
| #1 |  | X |
| #2 |  | X |
| #3 |  | X |
| #4 |  | X |

## 6.1 Solution #1: Provisioning of CAG info to the network that 5G Femto serves

### 6.1.1 Description

This solution mainly addresses two aspects that KI#2 states: (i) *"The provisioning/updating of CAG info to the network that 5G Femto serves [..] will be considered."* (ii) *"consider the scenario of allowing the access to a CAG cell in the [..] visited network."*

This solution introduces a new NF called 5G-CAS. 5G-CAS is a UDM-like repository in the Serving PLMN to store CAG info. An authorized administrator inputs CAG info via NEF of the Serving PLMN to 5G-CAS. Either AMF retrieves the CAG info from 5G-CAS or 5G-CAS notifies AMF of the CAG info update. AMF then sends it to gNB, when applicable, and to UE.

CAG info in 5G CAS is deployed per UE and provisioned by the authorized administrator per UE. AMF retrieves the CAG info and is notified of the CAG info update per UE.

NOTE 1: 5G-CAS is conceptually the same as EPS CSS.

NOTE 2: Control to allow only an authorized administrator to access NEF relies on the CAPIF functionality. That is not part of this solution.

NOTE 3: Provisioning of CAG info into 5G CAS can be performed via OAM instead of via NEF.

This solution works also for the non-roaming case; 5G-CAS stores CAG info for non-roaming UEs as well.

### 6.1.2 Procedures

#### 6.1.2.1 Registration procedure



Figure 6.1.2.1-1: Retrieval of CAG configuration provisioned in the Serving PLMN

1-4. The same as steps 1, 14a and 14b in clause 4.2.2.2.2 of TS 23.502.

5. The subscription data may contain a flag that suggests the Serving PLMN-specific subscription data needs to be retrieved from 5G CAS.

Editor's note: Whether the flag in the above is needed FFS.

6-7. The same as steps 14c in clause 4.2.2.2.2 of TS 23.502.

8-9. If the subscription data contains the flag, AMF retrieves the Serving PLMN-specific subscription data containing Allowed CAG list for the UE from 5G CAS.

10-11. AMF subscribes to the notification of update of CAG info from 5G CAS.

12. AMF concatenates the Allowed CAG list for the Serving PLMN retrieved from the subscription data in HPLMN and the Allowed CAG list retrieved from 5G CAS in the Serving PLMN and creates an Allowed CAG list. AMF provides this Allowed CAG list to gNB, when applicable, and to UE.

#### 6.1.2.2 Parameter provisioning



Figure 6.1.2.2-1: CAG configuration provisioning to the Serving PLMN

1-4. The same as steps 1,2,5 and 6 in clause 4.15.6.2 of TS 23.502, except for that CAG information is provisioned. The CAG info is provisioned per UE basis.

NOTE 1: Control to allow only an authorized administrator to access NEF relies on the CAPIF functionality. That is not part of this solution.

NOTE 2: Provisioning of CAG info into 5G CAS can be performed via OAM instead of via NEF.

#### 6.1.2.3 Parameter update to UE

This procedure applies when UE has registered and AMF has subscribed to the notification of update of CAG info from 5G CAS during the registration procedure (See steps 10-11 in Figure 6.X.2.1-1).



Figure 6.1.2.3-1: CAG configuration update to UE

1. 5G CAS sends to AMF a notification of the Serving PLMN-specific subscription data update per UE basis.

2-3. AMF concatenates the locally stored Allowed CAG list and the Allowed CAG list contained in the notification and creates an Allowed CAG list. Then, the same steps as steps 1, 2a, and 2b in clause 4.2.4.2 of TS 23.502 applies. (When needed, the same step as step 2c in clause 4.2.4.2 of TS 23.502 also applies.)

### 6.1.3 Impacts on services, entities and interfaces

The solution has the following impacts:

5G CAS:

- This stands for 5G CAg subscriber Server. 5G CAS is a new NF that is in the Serving PLMN and stores the Serving PLMN-specific subscription data for both non-roaming UEs and roaming UEs. 5G CAS supports a subset of service operations that UDM supports.

UDM:

- Access and mobility subscription data contains a new flag that suggests AMF that the Serving PLMN-specific subscription data needs to be retrieved from 5G CAS.

AMF:

- AMF checks the above-mentioned flag and accesses 5G CAS when needed. AMF creates an Allowed CAG list for the Serving PLMN per UE by concatenating Allowed CAG lists, one of which is retrieved from HPLMN and the other of which is retrieved in the Serving PLMN.

NEF:

- NEF receives CAG info related inputs from an administrator and accesses 5G CAS.

NOTE: OAM can be used instead of NEF.

gNB and UE are not impacted.

## 6.2 Solution #2: CAG provisioning and access control via V-UDR in the visited network

### 6.2.1 Description

In PNI-NPN, Closed Access Group (CAG) identifies a group of subscribers who are permitted/allowed to access one or more CAG cells of the PLMN identified by CAG ID(s), which is assumed to be reused for 5G Femto access control. A CAG cell is a cell broadcasting one or several CAG IDs. CAG membership of UE is configured in the user subscription data and on the UE. If a UE is roaming, the access control should be performed in the visited network based on CAG IDs configured in visited PLMN (VPLMN), and UE needs be provisioned with the allowed visited CAG cell access information in the visited network.

When introducing the concept of 5G Femto in FS\_5G\_Femto study, the scenario that the UE is roaming to VPLMN (or EHPLMN) and access to CAG cells of 5G Femto in VPLMN must be considered. Currently in 5G, allowed CAG list is provisioned in the HPLMN, of which the allowed CAG list in VPLMN may be also provisioned by HPLMN if SLA is assigned between HPLMN and VPLMN. However, in 5G femto scenario, the provisioning of CAG access may be rather dynamic e.g. when end users visit friend’s home or office in another country. Thus, in roaming cases, it may happen that the UE is not configured with CAG IDs valid in the VPLMN and UE subscription data in HPLMN do not contain list of CAG IDs of the VPLMN. When the UE is registered in the VPLMN (or EHPLMN), the provisioned allowed CAG list must contain VPLMN related CAG IDs to allow the UE to access CAG cells in the VPLMN. This problem applies also to PNI-NPN for which CAG concept was first introduced, i.e., there is no mechanism specified to allow a roaming UE to use a PNI-NPN in the VPLMN if the CAG ID of VPLMN is not provisioned to the UE by HPLMN.

In this solution, the provisioning of a roaming UE and the serving network to enable access control in the VPLMN is provided. As part of this solution, it is assumed that CAG concept as defined for PNI-NPN is re-used for 5G Femto deployments to enable Femto access control in 5G.

### 6.2.2 Procedures

The following figure represents a high-level procedure of the solution.



Figure 6.2.2-1: Call flow for CAG ID(s) provisioning in the visiting network

Step 0: The AMF/V-PCF subscribes to notifications from the V-UDR on changes in the visited CAG information.

Step 1: AF creates a request on visited CAG information which may include visited allowed CAG list, GPSI and external location information via AF. Optionally, the request may also include an expiry time in case the given information is only valid temporarily.

NOTE 1: External location represents the location of CAG cell of 5G Femto.

NOTE 2: GPSI can correspond to UE’s MSISDN.

NOTE 3: Provisioning of visited CAG information to V-UDR can also be performed via OAM. For this case, the given procedure continues to step 5.

Step 2: The V-NEF receives the AF request and authorizes the request. Then, the V-NEF translates the external location information and maps it to internal Ids such as Cell IDs, TAC.

Step 3: V-NEF stores the translated information to V-UDR in a way that visited CAG information and UE identity are mapped and stored together.

Step 4: V-NEF responses back to AF regarding the request on visited CAG information.

Step 5: (optional) V-UDR notifies the AMFs serving the particular Cell ID/TA regarding the update of information on CAG list.

Editor’s Note: How visited UDR contacts the AMF or finds AMF is FFS.

Step 6: UE performs manual selection of CAG cell.

Step 7: UE sends initial registration request or mobility registration update message to the visited network.

Step 8: AMF correlates the SUPI and its mapped GPSI/MSISDN received as part of subscription data from H-UDR/UDM, which also delivers the visited CAG allow indication to the serving AMF in visited network. If Visited CAG allow indication is set to true, AMF will get the visited CAG information for this UE either:

* from (local) V-UDR either as received via notification at step 5; or
* the AMF can fetch the Visited CAG information from visited UDR using the MSISDN provided from H-UDR/UDM.

For either option, the H-UDR/UDM shall provide MSISDN of the UE. The providing of MSISDN of the UE from H-UDR/UDM can be based on the enabled visited CAG allow indication of the UE and/or based on the indication from AMF that the UE is accessing via a visited CAG cell of 5G Femto. The fetched Visited CAG information is from V-UDR.

Step 9: AMF sends registration accept/reject message.

In case the registration request is rejected due to UE is not allowed to access this particular CAG cell of 5G Femto, then AMF sends the registration reject message to the UE along with a list of allowed CAG IDs. UE may use the received list of allowed CAG IDs e.g., to manually select another CAG cell from the list.

Step 10: If UE receives a registration accept, UE sends registration complete message.

### 6.2.3 Impacts on services, entities and interfaces

UE:

- receive visited CAG Information from AMF and update internal allowed CAG list,

- provide capability indication to AMF whether it supports visited CAG information.

AMF:

- based on visited CAG allowed list indication, fetch visited CAG Information from UDR (either directly or via UDM) per UE and perform CAG access control based on this information,

- provide visited CAG Information to UE if UE has indicated support of this feature.

UDR:

- store visited CAG Information and visited allowed CAG list indication per subscriber.

NEF:

- expose capability to provision visited CAG Information and visited CAG allowed list indication.

## 6.3 Solution #3: Enable provisioning of CAG information from AF via NEF in roaming scenario

### 6.3.1 Description

This solution is aimed at KI#2 about how to enable the CAG owner or an authorized administrator to provision/update CAG information to the network for 5G Femto access control. The provisioning/updating of CAG info to the network that 5G Femto serves and the network that the UE has subscription will be considered.

The network that 5G Femto serves and the network that the UE has subscription may be different networks (i.e. in roaming scenario). Based on the existing CAG mechanism, the CAG information is part of subscription data stored in the UDM. Therefore, in roaming scenario, it is not feasible for the authorized administrator to update the CAG information of a network in the subscription data stored in the UDM in another network.

In order to enable provisioning of CAG information in the above scenario, a CAG Management Function (CMF) is introduced. This CMF is deployed in the network that the 5G Femto serves. This CMF is used to store the CAG information of the UE whose home network is different from the network the CMF serves.

Editor’s note: whether there are present 1 or more CMF is FFS..

The UE of CAG owner can provide CAG information related to the UE of the visitor to the server used by the authorized administrator. The AF corresponding to the authorized administrator provides this information to the CMF. CMF can create and store the CAG information based on the information from the AF (authorized administrator).

When the UE of visitor selects the CAG cell manually and registers via a CAG cell of 5G Femto, AMF can request the CMF to authorize whether the UE is allowed to access the network via the CAG cell.

### 6.3.2 Procedures

#### 6.3.2.1 Procedure for provisioning CAG information to the CMF



**Figure 6.3.2.1-1: CAG information provisioning**

1. The UE of the CAG owner establishes a connection to the server used by the authorized administrator. The UE of the CAG owner can provide the CAG information related to the UE(s) of visitor to the authorized administrator. The CAG information related to the UE(s) of visitor includes the list of UE identifier (e.g. GPSI) and allowed CAG list. The Allowed CAG list may include one or all CAG ID of the Femto cell which the UE is allowed to access. In this interaction the information related to 1 or more UEs may be provided depending by needs. Optionally, the UE of the CAG owner can also provide validity conditions associated with the allowed CAG list. This interaction takes place at application layer and it is outside the scope of this study.

2 The AF corresponding to the authorized administrator provides the CAG information to be created or updated in a Nnef\_ParameterProvision\_Create or Nnef\_ParameterProvision\_Update Request to the NEF.

3. If the authorized administrator is authorised by the NEF to provision the parameters, the NEF requests to create, update and store the provisioned parameters as part of the subscriber data via Ncmf\_ParameterProvision\_Create or Ncmf\_ParameterProvision\_Update Request message.

4. CMF responds the request with Ncmf\_ParameterProvision\_Create/Update Response. If the procedure failed, the cause value indicates the reason.

5. NEF responds the request with Nnef\_ParameterProvision\_Create/Update Response. If the procedure failed, the cause value indicates the reason.

#### 6.3.2.2 Procedure for visitor UE registration



**Figure 6.3.2.2-1: Visitor UE registration procedure**

1. After the CAG information of the visitor UE is updated to the CMF, the UE of the visitor can manually select the CAG cell of 5G NR Femto and attempt registration.

NOTE: How the UE of the visitor be aware of the CAG ID is not defined by 3GPP.

2. UE sends Registration Request including an indication indicating that it is a visitor UE.

3. RAN performs AMF selection.

4. RAN sends the Registration Request from the visitor UE to the AMF.

5. AMF performs AUSF select for the security procedure.

6. Security procedure is performed.

7. AMF determines to perform the access control for the CAG cell via CMF based on the indication from the UE in the Registration Request. AMF shall retrieve the CAG information stored by CMF to determine whether the UE is allowed to access to the CAG cell. If the CAG ID is not in the allowed CAG list of the UE, AMF can reject the registration request.

8. Step 10 – 25 in clause 4.2.2.2.2 (General Registration) of TS 23.502 [3].

### 6.3.3 Impacts on services, entities and interfaces

UE:

* For the UE of visitor, the ability to indicate it is a visitor UE for CAG cell of 5G NR Femto in the Registration Request

Note: The interactions between the UE and the AF takes place at application layer therefore is outside the scope of this study and this interaction has no impact on the UE.

AF (Authorized administrator):

* Ability to perform the External Parameter Provisioning procedure to provide the UE identifier, allowed CAG list and validity conditions to the UDM.

CMF:

* A new NF to create and store the CAG information based on the provisioned data.

AMF:

* Ability to retrieve the CAG information stored in the CMF to determine whether the UE is allowed to access to the CAG cell.

## 6.4 Solution #4: provisioning of subscribers allowed to access CAG cell using CAG subscription update from AF

### 6.4.1 Description

Editor's note: This clause will describe the solution principles and architecture assumptions for corresponding key issue(s). Sub-clause(s) may be added to capture details.

CAG owner or administrator may provision to 5GC subscribers allowed to access a CAG cell.

In principle provisioning CAG information to UDM is based on the clause 4.2.4.2 of TA 23.502 and provisioning the updated CAG information is based on the clause 4.15.6.2 of TA 23.502.;

* AF (CAG owner or administrator) provides UE ID (e.g. SUPI, MSISDN or GPSI), and allowed Cell information (e.g. cell ID(s), FEMTO device ID) or CAG information, including Validity Time (for temporary users) per UE via Nnef\_ParameterProvision\_Create/Update/Delete procedures.
* NEF authorizes the request from AF, determines SUPI from GPSI/MSISDN if needed, may derive corresponding CAG information per UE and then provision into UDM.
* And UDM may provide CAG information to the corresponding UEs via UCU procedures via AMF.
* The result of UE provisioning can be reported to AF.

Editor's note: for the roaming scenario, how to AF provision CAG subscription is FFS.

### 6.4.2 Procedures

Editor's note: This clause describes high-level procedures and information flows for the solution.

The Figure 6.4.2-1 shows the procedure for how the AF provision CAG subscriptions allowed to access CAG cell:



**Figure 6.4.2-1: Procedures for AF to provision CAG subscriptions allowed to access CAG cell.**

The steps of Figure 6.4.3-1 are described as follows:

1. The AF provides UE ID (e.g. SUPI, MSISDN or GPSI), allowed Cell information (e.g. cell ID(s), FEMTO device ID) or CAG information including Validity Time (for temporary users) per UE via Nnef\_ParameterProvision\_Create/Update/Delete procedures.

2. NEF authorizes the request from AF, determines SUPI from GPSI/MSISDN if needed and, may derive corresponding CAG information or allowed Cell information per UE and then provisioned into UDM.

3/5. UDM is provisioned CAG information and can be updated to UDR also.

6. UDM sets the CAG information update indicator to confirm its update.

7-10. CAG information is provisioned.

11-12. CAG information update result is notified to the AF via NEF.

### 6.4.3 Impacts on services, entities and interfaces

Editor's note: This clause captures impacts on existing services, entities and interfaces.

UDM: CAG information for UE(s) are provisioned from AF via NEF and notify the result of provisioning to AF.

NEF: to receive and authorize CAG owner or administrator's input (UE ID, allowed Cell information or CAG information) and, if required, change them into 5GS term (e.g. CAG information) and provide UDM.

AF: to provide UE ID and allowed Cell information or CAG information to 5GC.

# 7 Overall Evaluation

Editor's note: This clause provides evaluations of different solutions.

# 8 Conclusions

Editor's note: This clause will list conclusions that have been agreed during the course of the study item activities.

Annex A (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2024-01 | SA2#160-Ad Hoc-e | S2-2401377 | - | - | - | Proposed skeleton agreed for FS\_5G\_Femto | 0.0.0 |
| 2024-01 | SA2#160-Ad Hoc-e | S2-2401716 | - | - | - | Scope for TR 23.700-45 | 0.1.0 |
| 2024-01 | SA2#160-Ad Hoc-e | S2-2401717 | - | - | - | Architecture assumptions and requirements for TR 23.700-45 | 0.1.0 |
| 2024-01 | SA2#160-Ad Hoc-e | S2-2401718 | - | - | - | New KI: Support of UE move between CAG cell of 5G Femto and CSG cell. | 0.1.0 |
| 2024-01 | SA2#160-Ad Hoc-e | S2-2401719 | - | - | - | New KI: Enabling provisioning of subscribers allowed to access CAG cell and managing access control by the CAG owner or an authorized administrator. | 0.1.0 |
| 2024-03 | SA2#161 | S2-2403237 | - | - | - | TR Scope update. | 0.2.0 |
| 2024-03 | SA2#161 | S2-2403239 | - | - | - | KI#1 update not to support one-way handover for 5G Femto Mobility. | 0.2.0 |
| 2024-03 | SA2#161 | S2-2403665 | - | - | - | KI#2 New solution for Provisioning of CAG info to the network that 5G Femto serves. | 0.2.0 |
| 2024-03 | SA2#161 | S2-2403520 | - | - | - | KI#2 Solution for CAG provisioning and access control via V-UDR in the visited network. | 0.2.0 |
| 2024-03 | SA2#161 | S2-2403246 | - | - | - | KI#2, New Solution for enabling provisioning of CAG information in roaming scenario. | 0.2.0 |
| 2024-03 | SA2#161 | S2-2403247 | - | - | - | New Solution for KI#2: provisioning of subscribers allowed to access CAG cell. | 0.2.0 |