**Source:**        TSG CN WG4

**Title:**         Corrections on IP-based Multimedia services Cx-/Dx-interface

**Agenda item:**   8.8

**Document for:**  APPROVAL

| Spec | CR | Rev | Doc-2nd-Level | Phase | Subject | Cat | Ver_C |
|------|-----|-----|---------------|-------|---------|-----|-------|
| 29.228 | 056 | 3 | | Rel-5 | Conditions for inclusion of Charging Information | F | 5.5.0 |
| 29.228 | 057 | 3 | | Rel-6 | Conditions for inclusion of Charging Information | A | 6.00 |
| | | | | | | | 5.5.0 |
| | | | | | | | 5.5.0 |

*CR-Form-v7*

# CHANGE REQUEST

⌘     **29.228 CR 056**    ⌘**rev** **3** ⌘   Current version: **5.5.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

**Proposed change affects:**    UICC apps⌘ ☐      ME ☐   Radio Access Network ☐   Core Network **X**

| | |
|---|---|
| ***Title:*** ⌘ | Conditions for inclusion of Charging Information |

| | |
|---|---|
| ***Source:*** ⌘ | CN4 |

| | | | |
|---|---|---|---|
| ***Work item code:*** ⌘ | TEI5 | ***Date:*** ⌘ | 11/12/2003 |

| | |
|---|---|
| ***Category:*** ⌘ **F** | ***Release:*** ⌘ Rel-5 |

*Use <u>one</u> of the following categories:*
    ***F*** *(correction)*
    ***A*** *(corresponds to a correction in an earlier release)*
    ***B*** *(addition of feature),*
    ***C*** *(functional modification of feature)*
    ***D*** *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP <u>TR 21.900</u>.

*Use <u>one</u> of the following releases:*
    *2      (GSM Phase 2)*
    *R96    (Release 1996)*
    *R97    (Release 1997)*
    *R98    (Release 1998)*
    *R99    (Release 1999)*
    *Rel-4   (Release 4)*
    *Rel-5   (Release 5)*
    *Rel-6   (Release 6)*

| | |
|---|---|
| ***Reason for change:*** ⌘ | Within 29.228, charging information is currently specified as an Optional parameter in the SAA message.  However, no indication is given of when Charging Information should be included and when it should not.<br><br>In TR 23.815 the following text is found in section 5.1.4;-<br>'The Charging Function name(s) to be contacted for a particular SIP dialog and/or service shall be uploaded to the S-CSCF from the HSS during the registration phase, and is applicable for the duration of the registration.'<br><br>Further, in 24.229 section 4.5.5, this text is found ;-<br>'The CCF addresses and ECF addresses are retrieved from an Home Subscriber Server (HSS) via the Cx interface and passed by the S-CSCF to subsequent entities.'<br><br>Earlier in 24.229 section 4.5.5 the following text is found;-<br>'There may be multiple addresses for CCF and ECF addresses populated into the P-Charging-Function-Addresses header of the SIP request or response. The parameters are ccf and ecf. Only one instance of ccf is required. Additional ccf addresses may be included by each network for redundancy purposes, but the first instance of ccf is the primary address.  If ecf address is included for online charging, then additional instances may also be included for redundancy.'<br><br>This implies that when charging information is included in SAA, the Primary Charging Collection Function shall always be included in that parameter and that all other parameters are only included if they are available.<br><br>From these requirements, it seems clear that the HSS should be providing the S-CSCF with charging information in some clearly defined situations ie, successful registration of the subscriber, and that when it is included, Primary ECCF shall |

| | | be present. It is these conditions that are added with this CR. |
| :--- | :--- | :--- |
| | | This is an essential correction. |
| *Summary of change:* ⌘ | | The conditions for inclusion of Charging Information in SAA are added. |
| *Consequences if not approved:* ⌘ | | Charging Information could be excluded from SAA incorrectly, or included when not required. Primary-CCF-address may be excluded when it should actually always be included. Charging Information for the subscriber may be incorrect as a result. |

| *Clauses affected:* | ⌘ | 6.1.2 | | |
| :--- | :--- | :--- | :--- | :--- |
| | | **Y** \| **N** | | |
| *Other specs affected:* | ⌘ | **X** \| | Other core specifications | ⌘ | 29.229 CR 029, 29.328 CR 042 |
| | | \| **X** | Test specifications | | |
| | | \| **X** | O&M Specifications | | |
| | | | | |
| *Other comments:* | ⌘ | | | |

## How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

## 6.1.2    S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

**Table 6.1.2.1: S-CSCF registration/deregistration notification request**

| Information element name | Mapping to Diameter AVP | Cat. | Description |
|---|---|---|---|
| Public User Identity (See 7.2) | Public-Identity | C | User public identity or list of user public identities. At least one public identity shall be present if User-Name is not present in the request. |
| S-CSCF Name (See 7.4) | Server-Name | M | Name of the S-CSCF. |
| Private User Identity (See 7.3) | User-Name | C | User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present. |
| Server Assignment Type (See 7.8) | Server-Assignment-Type | M | Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values. |
| User Data Request Type (See 7.15) | User-Data-Request-Type | M | Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values. |
| User Data Already Available (See 7.16) | User-Data-Already-Available | M | This indicates if the user profile is already available in the S-CSCF. |

| Routing Information (See 7.13) | Destination-Host | C | If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command. |
|---|---|---|---|
| | | | This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command. |
| | | | This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF. |

**Table 6.1.2.2: S-CSCF registration/deregistration notification response**

| Information element name | Mapping to Diameter AVP | Cat. | Description |
|---|---|---|---|
| Private User Identity (See 7.3) | User-Name | C | User private identity. |
| | | | It shall be present if it is available when the HSS sends the response. |
| | | | It may be absent in the following error case: when the Server-Assignment-Type of the request is UNREGISTERED_USER and the received public user identity is not known by the HSS. |
| Registration result (See 7.6) | Result-Code / Experimental-Result | M | Result of registration. |
| | | | Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. |
| | | | Experimental-Result AVP shall be used for Cx/Dx errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. |
| User Profile (See 7.7) | User-Data | C | Relevant user profile. |
| | | | It shall be present when Server-Assignment-Type in the request is equal to NO_ASSIGNMENT. If the Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER the User-Data AVP shall be present according to the rules defined in the section 6.6. |
| | | | If the S-CSCF receives more data than it is prepared to accept, it shall perform the de-registration of the user with User-Authorization-Type set to DEREGISTRATION_TOO_MUCH_DATA and send back a SIP 3xx or 480 (Temporarily Unavailable) response, which shall trigger the selection of a new S-CSCF by the I-CSCF, as specified in 3GPP TS 24.229 [8]. |
| Charging Information (See 7.12) | Charging-Information | C~~O~~ | Addresses of the charging functions. |
| | | | It shall be present when Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER and when Result-Code is equal to DIAMETER_SUCCESS. |
| | | | When this parameter is included, the Primary Charging Collection Function name shall be included. All other elements shall be included if they are available. |

## 6.1.2.1      Detailed behaviour

On registering/deregistering a public identity the S-CSCF shall inform the HSS. The same procedure is used by the S-CSCF to get the user profile. The relevant user profile downloaded is described in more detailed in the section 6.6. The HSS holds information about the state of registration of all the identities of the user. The S-CSCF uses this procedure to update such state. The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user is known. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. The HSS may check whether the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_IDENTITIES_DONT_MATCH.

3. Check the Server Assignment Type value received in the request:

   - If it indicates REGISTRATION or RE_REGISTRATION, the HSS shall download the relevant user public identity information. If set, the flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates UNREGISTERED_USER, the HSS shall store the S-CSCF name, set the registration state of the public identity as unregistered, i.e. registered as a consequence of a terminating call and download the relevant user public identity information. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

   - If it indicates TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION, DEREGISTRATION_TOO_MUCH_DATA or ADMINISTRATIVE_DEREGISTRATION, the HSS shall clear the S-CSCF name for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as not registered. If no public identity is present in the request, the private identity shall be present; the HSS shall clear the S-CSCF name for all the identities of the user and set their registration state to not registered. The Result-Code shall be set to DIAMETER_SUCCESS.

   - If it indicates TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME or USER_DEREGISTRATION_STORE_SERVER_NAME the HSS decides whether to keep the S-CSCF name stored or not for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as unregistered. If no public identity is present in the request, the private identity shall be present. If the HSS decided to keep the S-CSCF name stored the HSS keeps the S-CSCF name stored for all the identities of the user and set their registration state to unregistered.

     If the HSS decides to keep the S-CSCF name the Result-Code shall be set to DIAMETER_SUCCESS.

     If the HSS decides not to keep the S-CSCF name the Experimental-Result-Code shall be set to DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED.

   - If it indicates NO_ASSIGNMENT, the HSS checks whether the user is assigned for the S-CSCF requesting the data and download the user public identity information requested in the User-Data-Request-Type AVP. The Result-Code shall be set to DIAMETER_SUCCESS. If the requesting S-CSCF is not the same as the assigned S-CSCF, the Result-Code shall be set to DIAMETER_UNABLE_TO COMPLY.

     Only one public identity shall be present in the request. If more than one public identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates AUTHENTICATION_FAILURE or AUTHENTICATION_TIMEOUT, the HSS shall clear the S-CSCF name for the public identity that the S-CSCF indicated in the request and set the registration state of the identity as not registered. The flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

See chapter 8.1.2 and 8.1.3 for the description of the handling of the error situations: reception of an S-CSCF name different from the one stored in the HSS and reception of a Server-Assignment-Type value not compatible with the registration state of the user.

*CR-Form-v7*

# CHANGE REQUEST

⌘          **29.228 CR 057**          ⌘**rev  3** ⌘  Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

*Proposed change affects:*     UICC apps⌘ ☐          ME ☐   Radio Access Network ☐   Core Network **X**

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Conditions for inclusion of Charging Information |

| | | |
|---|---|---|
| ***Source:*** | ⌘ | CN4 |

| | | | | |
|---|---|---|---|---|
| ***Work item code:*** | ⌘ | TEI5 | ***Date:*** ⌘ | 11/12/2003 |

| | | | | |
|---|---|---|---|---|
| ***Category:*** | ⌘ | **A** | ***Release:*** ⌘ | Rel-6 |

*Use <u>one</u> of the following categories:*
    **F** *(correction)*
    **A** *(corresponds to a correction in an earlier release)*
    **B** *(addition of feature),*
    **C** *(functional modification of feature)*
    **D** *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP <u>TR 21.900</u>.

*Use <u>one</u> of the following releases:*
    *2     (GSM Phase 2)*
    *R96  (Release 1996)*
    *R97  (Release 1997)*
    *R98  (Release 1998)*
    *R99  (Release 1999)*
    *Rel-4  (Release 4)*
    *Rel-5  (Release 5)*
    *Rel-6  (Release 6)*

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Within 29.228, charging information is currently specified as an Optional parameter in the SAA message.  However, no indication is given of when Charging Information should be included and when it should not. |

In TR 23.815 the following text is found in section 5.1.4;-
'The Charging Function name(s) to be contacted for a particular SIP dialog and/or service shall be uploaded to the S-CSCF from the HSS during the registration phase, and is applicable for the duration of the registration.'

Further, in 24.229 section 4.5.5, this text is found ;-
'The CCF addresses and ECF addresses are retrieved from an Home Subscriber Server (HSS) via the Cx interface and passed by the S-CSCF to subsequent entities.'

Earlier in 24.229 section 4.5.5 the following text is found;-
'There may be multiple addresses for CCF and ECF addresses populated into the P-Charging-Function-Addresses header of the SIP request or response. The parameters are ccf and ecf. Only one instance of ccf is required. Additional ccf addresses may be included by each network for redundancy purposes, but the first instance of ccf is the primary address.  If ecf address is included for online charging, then additional instances may also be included for redundancy.'

This implies that when charging information is included in SAA, the Primary Charging Collection Function shall always be included in that parameter and that all other parameters are only included if they are available.

From these requirements, it seems clear that the HSS should be providing the S-CSCF with charging information in some clearly defined situations ie, successful registration of the subscriber, and that when it is included, Primary ~~ECF~~ CCF

| | shall be present.  It is these conditions that are added with this CR.

This is an essential correction. |
|---|---|
| *Summary of change:* ⌘ | The conditions for inclusion of Charging Information in SAA are added. |
| *Consequences if not approved:* ⌘ | Charging Information could be excluded from SAA incorrectly, or included when not required.  Primary CCF-address may be excluded when it should actually always be included.  Charging Information for the subscriber may be incorrect as a result. |

| *Clauses affected:* | ⌘ | 6.1.2 | |
|---|---|---|---|

| | | **Y** | **N** | | |
|---|---|---|---|---|---|
| *Other specs affected:* | ⌘ | | **X** | Other core specifications | ⌘ |
| | | | **X** | Test specifications | |
| | | | **X** | O&M Specifications | |

| *Other comments:* | ⌘ | |
|---|---|---|

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## 6.1.2 S-CSCF registration/deregistration notification

This procedure is used between the S-CSCF and the HSS. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-Put and Cx-Pull (see 3GPP TS 23.228 [1]) and is used:

- To assign an S-CSCF to a public identity, or to clear the name of the S-CSCF assigned to one or more public identities.

- To download from HSS the relevant user profile information that the S-CSCF needs to serve the user.

This procedure is mapped to the commands Server-Assignment-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.2.1 and 6.1.2.2 describe the involved information elements.

**Table 6.1.2.1: S-CSCF registration/deregistration notification request**

| Information element name | Mapping to Diameter AVP | Cat. | Description |
|---|---|---|---|
| Public User Identity (See 7.2) | Public-Identity | C | User public identity or list of user public identities. At least one public identity shall be present if User-Name is not present in the request. |
| S-CSCF Name (See 7.4) | Server-Name | M | Name of the S-CSCF. |
| Private User Identity (See 7.3) | User-Name | C | User private identity. It shall be present if it is available when the S-CSCF issues the request. It may be absent during the initiation of a session to an unregistered user. In such situation, Server-Assignment-Type shall contain the value UNREGISTERED_USER. In case of de-registration, Server-Assignment-Type equal to TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION or ADMINISTRATIVE_DEREGISTRATION, if no Public-Identity AVPs are present then User-Name AVP shall be present. |
| Server Assignment Type (See 7.8) | Server-Assignment-Type | M | Type of update the S-CSCF requests in the HSS (e.g: de-registration). See 3GPP TS 29.229 [5] for all the possible values. |
| User Data Request Type (See 7.15) | User-Data-Request-Type | M | Part of the user profile the S-CSCF requests from the HSS (e.g: complete profile). See 3GPP TS 29.229 [5] for all the possible values. |
| User Data Already Available (See 7.16) | User-Data-Already-Available | M | This indicates if the user profile is already available in the S-CSCF. |

| Routing Information (See 7.13) | Destination-Host | C | If the S-CSCF knows HSS name Destination-Host AVP shall be present in the command. |
|---|---|---|---|
| | | | This information is available if the request belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command. |
| | | | This information may not be available if the command is sent as a consequence of a session termination for an unregistered user. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the S-CSCF. |

**Table 6.1.2.2: S-CSCF registration/deregistration notification response**

| Information element name | Mapping to Diameter AVP | Cat. | Description |
|---|---|---|---|
| Private User Identity (See 7.3) | User-Name | C | User private identity. |
| | | | It shall be present if it is available when the HSS sends the response. |
| | | | It may be absent in the following error case: when the Server-Assignment-Type of the request is UNREGISTERED_USER and the received public user identity is not known by the HSS. |
| Registration result (See 7.6) | Result-Code / Experimental-Result | M | Result of registration. |
| | | | Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. |
| | | | Experimental-Result AVP shall be used for Cx/Dx errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP. |
| User Profile (See 7.7) | User-Data | C | Relevant user profile. |
| | | | It shall be present when Server-Assignment-Type in the request is equal to NO_ASSIGNMENT. If the Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER the User-Data AVP shall be present according to the rules defined in the section 6.6. |
| | | | If the S-CSCF receives more data than it is prepared to accept, it shall perform the de-registration of the user with User-Authorization-Type set to DEREGISTRATION_TOO_MUCH_DATA and send back a SIP 3xx or 480 (Temporarily Unavailable) response, which shall trigger the selection of a new S-CSCF by the I-CSCF, as specified in 3GPP TS 24.229 [8]. |
| Charging Information (See 7.12) | Charging-Information | C~~O~~ | Addresses of the charging functions. |
| | | | It shall be present when Server-Assignment-Type in the request is equal to REGISTRATION, RE_REGISTRATION or UNREGISTERED_USER and when Result-Code is equal to DIAMETER_SUCCESS. |
| | | | When this parameter is included, the Primary Charging Collection Function address shall be included.  All other elements shall be included if they are available. |

## 6.1.2.1 Detailed behaviour

On registering/deregistering a public identity the S-CSCF shall inform the HSS. The same procedure is used by the S-CSCF to get the user profile. The relevant user profile downloaded is described in more detailed in the section 6.6. The HSS holds information about the state of registration of all the identities of the user. The S-CSCF uses this procedure to update such state. The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user is known. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. The HSS may check whether the private and public identities received in the request belong to the same user. If not Experimental-Result-Code shall be set to DIAMETER_ERROR_IDENTITIES_DONT_MATCH.

3. Check the Server Assignment Type value received in the request:

   - If it indicates REGISTRATION or RE_REGISTRATION, the HSS shall download the relevant user public identity information. If set, the flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates UNREGISTERED_USER, the HSS shall store the S-CSCF name, set the registration state of the public identity as unregistered, i.e. registered as a consequence of a terminating call and download the relevant user public identity information. The Result-Code shall be set to DIAMETER_SUCCESS.

     Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

   - If it indicates TIMEOUT_DEREGISTRATION, USER_DEREGISTRATION, DEREGISTRATION_TOO_MUCH_DATA or ADMINISTRATIVE_DEREGISTRATION, the HSS shall clear the S-CSCF name for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as not registered. If no public identity is present in the request, the private identity shall be present; the HSS shall clear the S-CSCF name for all the identities of the user and set their registration state to not registered. The Result-Code shall be set to DIAMETER_SUCCESS.

   - If it indicates TIMEOUT_DEREGISTRATION_STORE_SERVER_NAME or USER_DEREGISTRATION_STORE_SERVER_NAME the HSS decides whether to keep the S-CSCF name stored or not for all the public identities that the S-CSCF indicated in the request and set the registration state of the identities as unregistered. If no public identity is present in the request, the private identity shall be present. If the HSS decided to keep the S-CSCF name stored the HSS keeps the S-CSCF name stored for all the identities of the user and set their registration state to unregistered.

     If the HSS decides to keep the S-CSCF name the Result-Code shall be set to DIAMETER_SUCCESS.

     If the HSS decides not to keep the S-CSCF name the Experimental-Result-Code shall be set to DIAMETER_SUCCESS_SERVER_NAME_NOT_STORED.

   - If it indicates NO_ASSIGNMENT, the HSS checks whether the user is assigned for the S-CSCF requesting the data and download the user public identity information requested in the User-Data-Request-Type AVP. The Result-Code shall be set to DIAMETER_SUCCESS. If the requesting S-CSCF is not the same as the assigned S-CSCF, the Result-Code shall be set to DIAMETER_UNABLE_TO COMPLY.

     Only one public identity shall be present in the request. If more than one public identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and no user information shall be returned.

   - If it indicates AUTHENTICATION_FAILURE or AUTHENTICATION_TIMEOUT, the HSS shall clear the S-CSCF name for the public identity that the S-CSCF indicated in the request and set the registration state of the identity as not registered. The flag that indicates that the identity is pending of the confirmation of the authentication shall be cleared. The Result-Code shall be set to DIAMETER_SUCCESS.

Only one identity shall be present in the request. If more than one identity is present the Result-Code shall be set to DIAMETER_AVP_OCCURS_TOO_MANY_TIMES and the modifications specified in the previous paragraph shall not be performed.

See chapter 8.1.2 and 8.1.3 for the description of the handling of the error situations: reception of an S-CSCF name different from the one stored in the HSS and reception of a Server-Assignment-Type value not compatible with the registration state of the user.