



# NGSI Data Configuration and Management

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# 1. Scope

This document is the Technical Specification for the interfaces for Data Configuration and Management. According to the NGSI AD [NGSI-AD] the Data Configuration and Management component exposes the interfaces NGSI-1, NGSI-2 and NGSI-3.

NGSI v1.0 defines abstract interfaces. This technical specification builds the basis for the definition of binding technologies based on the abstract interface definitions given in the TS.

The TS is not basis for testing without a respective binding.

## 2. References

### 2.1 Normative References

- [3GPP TS 29.199-1] “Open Service Access (OSA) Parlay X web services; Part 1”, URL:<http://www.3gpp.org/>
- [3GPP TS 29.199-13] “Open Service Access (OSA) Parlay X web services; Part 13”, URL:<http://www.3gpp.org/>
- [NGSI-AD] “NGSI Architecture Document”, Open Mobile Alliance™, OMA-AD-NGSI-V1\_0, URL:<http://www.openmobilealliance.org/>
- [NGSI-RD] “NGSI Requirements”, Open Mobile Alliance™, OMA-RD-NGSI-V1\_0, URL:<http://www.openmobilealliance.org/>
- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, URL:<http://www.ietf.org/rfc/rfc2119.txt>
- [RFC2616] “Hypertext Transfer Protocol -- HTTP/1.1”, R. Fielding, June 1999, URL:<http://www.ietf.org/rfc/rfc2616.txt>
- [RFC4234] “Augmented BNF for Syntax Specifications: ABNF”. D. Crocker, Ed., P. Overell. October 2005, URL:<http://www.ietf.org/rfc/rfc4234.txt>
- [SCRRULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR\_Rules\_and\_Procedures, URL:<http://www.openmobilealliance.org/>

### 2.2 Informative References

- [OMADICT] “Dictionary for OMA Specifications”, Version 2.7, Open Mobile Alliance™, OMA-ORG-Dictionary-V2\_7, URL:<http://www.openmobilealliance.org/>

## 3. Terminology and Conventions

### 3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

### 3.2 Definitions

The definitions of the OMA Dictionary [OMADICT] are valid for this document unless otherwise stated below. Additionally the definitions given in [3GPP TS 29.199-1] apply.

|                               |               |
|-------------------------------|---------------|
| <b>Communication Service</b>  | See [NGSI-RD] |
| <b>Converged Address Book</b> | See [NGSI-RD] |
| <b>Group Identifier</b>       | See [NGSI-RD] |
| <b>Personal Contact Card</b>  | See [NGSI-RD] |
| <b>Service Recommendation</b> | See [NGSI-RD] |

### 3.3 Abbreviations

|             |                                    |
|-------------|------------------------------------|
| <b>NGSI</b> | Next Generation Service Interfaces |
| <b>OMA</b>  | Open Mobile Alliance               |
| <b>OSA</b>  | Open Service Access                |
| <b>URI</b>  | Uniform Resource Identifier        |
| <b>URL</b>  | Uniform Resource Locator           |

## 4. Introduction

The Data Configuration and Management component supports the following functions:

- Management (i.e. create, read, update, delete) of data stored in a document;
- Subscription to receive notification of data change in the content of a document;
- Notification of data change in the content of a document.

These functions are exposed by the interfaces NGSI-1, NGSI-2 and NGSI-3 as defined in [NGSI-AD] and summarized in the subsection 4.1. This TS specification is part of the TS specifications for the NGSI enabler.

### 4.1 Version 1.0

The NGSI TS Data Configuration and Management document specifies the following interface functions [NGSI-AD]:

- NGSI-1, that supports the following function:
  - Management of data contained in a transparently handled document;
- NGSI-2, that supports the following functions:
  - Subscription to receive notification of data change in the content of a document;
  - Notification of data change in the content of a document in the form of:
    - Notification of change without data attached;
    - Notification of change with changed document attached;
- NGSI-3, that supports the following functions:
  - Subscription to receive notification of data change in group information;
  - Notification of data change in group information.

NGSI-1 and NGSI-2 interfaces handle documents transparently to their content. This means the management and subscription/notification handling is independent of the content, format and the application usage. The documents supported can be XML or non-XML documents. These are new NGSI interfaces which do not have a Parlay X counterpart.

The NGSI-3 interface extends Parlay X Part 13 ([3GPP TS 29.199-13]).

#### 4.1.1 Backward Compatibility to the Parlay Specifications

**NGSI-1: None.**

**NGSI-2: None**

**NGSI-3:**

The Group handling functions of the NGSI-3 interface provides an extension to the service API provided by OSA/Parlay [3GPP TS 29.199-13]. This interface uses the data types as defined in the respective [3GPP TS 29.199-13] and [3GPP TS 29.199-1]. The name space definition given in the [3GPP TS 29.199-13] specifications apply unchanged.

## 5. NGSI-1 Interface: Technical Details

### 5.1 NGSI-1: Generic Data Management

#### 5.1.1 Service Description

The Generic Data Management functions of the NGSI-1 provide a way to manage documents owned by the Service Provider, without the need of an application-usage specific API. The content of the document is opaque to the NGSI component. The Service Provider MAY allow the document to be represented in more than one content type (e.g.: application/xml, application/json, etc.).

#### 5.1.2 Interface definition

The Generic Data Management functions of the NGSI-1 are provided by the interface *DocumentManager*.

##### 5.1.2.1 Interface: DocumentManager

The *DocumentManager* interface controls the management of a document, through the operations of creation, retrieval, update and deletion.

###### 5.1.2.1.1 Operation: createDocument

The invocation of the createDocument operation requests to create a new document.

When the content type field or the content encoding field (if present), within the *Document* parameter are not supported for the requested document type, a fault (POL0011) SHALL be returned.

If the *DocumentType* parameter is specified and the server does not know the document type, a fault (POL0460) SHALL be returned.

If the *DocumentType* parameter is not specified, the kind of document to create MAY be inferred by the Service Provider. In case this is not possible, a fault (POL0460) SHALL be returned.

###### 5.1.2.1.1.1. Input message: createDocumentRequest

| Part name    | Part type  | Optional | Description   |
|--------------|------------|----------|---|
| DocumentType | xsd:string | Yes      | The document type determines what kind of document to create, (e.g.: a buddy-list document, a policy rules document for a specific service, ...). This parameter is related to the semantics of the document, not to its format.  |
| Document     | Document   | Yes      | The document to be created. If this parameter is not specified, this operation creates an "empty" document (i.e.: it just reserves a DocumentId). It is also possible to create an "empty" document by providing an empty <i>DocumentBody</i> in the <i>Document</i> structure. |

###### 5.1.2.1.1.2. Output message: createDocumentResponse

| Part name       | Part type  | Optional | Description                                   |
|-----------------|------------|----------|---|
| DocumentId      | xsd:anyURI | No       | Identifier of the just created document.      |
| DocumentVersion | xsd:string | No       | Indicates the initial version of the document |

###### 5.1.2.1.1.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.



- POL0011: Media Type not supported.
- POL0460: Unknown document type.

### 5.1.2.1.2 Operation: `getDocument`

The invocation of the `getDocument` operation requests to retrieve a document.

The `ContentNegotiation` parameter in the `getDocumentRequest`:

- SHALL contain a list of the MIME content types supported by the client, in order of preference, with the intention to use one of them on the `Document` parameter in the response;
- MAY contain a list of the types of encoding (i.e. compression) supported by the client, with the intention to use one of them on the `Document` parameter in the response.

When none of the content types is supported for the requested document, a fault (POL0011) SHALL be returned.

When none of the content encodings (if requested by the client) is supported for the requested document, a fault (POL0011) SHALL be returned. If no content encoding was provided by the client, the server SHALL NOT encode the document.

#### 5.1.2.1.2.1. Input message: `getDocumentRequest`

| Part name          | Part type          | Optional | Description   |
|--------------------|--------------------|----------|---|
| DocumentId         | xsd:anyURI         | No       | Identifier of the document.   |
| ContentNegotiation | ContentNegotiation | No       | Used to negotiate the content type and possibly the content encoding (i.e. compression) of the <code>Document</code> parameter in the response. |

#### 5.1.2.1.2.2. Output message: `getDocumentResponse`

| Part name       | Part type  | Optional | Description   |
|-----------------|------------|----------|---|
| Document        | Document   | No       | The retrieved document.   |
| DocumentVersion | xsd:string | No       | Indicates the version of the document.<br><b>Note:</b> in some bindings the document version could be mapped to ETag HTTP header [RFC2616]. |

#### 5.1.2.1.2.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.
- POL0011: Media Type not supported.

### 5.1.2.1.3 Operation: `updateDocument`

The invocation of the `updateDocument` operation requests to update a document, replacing the whole document with a new one.

When the content type field or the content encoding field (if present), within the `Document` parameter are not supported for the requested document type, a fault (POL0011) SHALL be returned.

If the `DocumentVersion` parameter does not indicate the latest version of the document on the server, a fault (SVC0440) SHALL be returned.

**Note:** This operation does not include updating the document on the server back to the previously known version (i.e. reverting).

#### 5.1.2.1.3.1. Input message: updateDocumentRequest

| Part name       | Part type  | Optional | Description  |
|-----------------|------------|----------|--|
| DocumentId      | xsd:anyURI | No       | Identifier of the document.  |
| Document        | Document   | No       | The new document.  |
| DocumentVersion | xsd:string | No       | The last version of the document known by the client.<br><b>Note:</b> in some bindings the document version could be mapped to ETag HTTP header [RFC2616]. |

#### 5.1.2.1.3.2. Output message: updateDocumentResponse

| Part name       | Part type  | Optional | Description  |
|-----------------|------------|----------|--|
| DocumentVersion | xsd:string | No       | Indicates the version of the document <i>after</i> the update. |

#### 5.1.2.1.3.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0440: Old document version.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.
- POL0011: Media Type not supported.

### 5.1.2.1.4 Operation: deleteDocument

The invocation of the *deleteDocument* operation requests to delete a document.

If the *DocumentVersion* parameter is specified and does not indicate the latest version of the document on the server, a fault (SVC0440) SHALL be returned.

#### 5.1.2.1.4.1. Input message: deleteDocumentRequest

| Part name       | Part type  | Optional | Description   |
|-----------------|------------|----------|---|
| DocumentId      | xsd:anyURI | No       | Identifier of the document.                           |
| DocumentVersion | xsd:string | Yes      | The last version of the document known by the client. |

#### 5.1.2.1.4.2. Output message: deleteDocumentResponse

| Part name | Part type | Optional | Description |
|-----------|-----------|----------|-------------|
| None      |           |          |             |

#### 5.1.2.1.4.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0440: Old document version.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error

## 6. NGSI-2 Interface: Technical Details

### 6.1 NGSI-2: Generic Data Change Notification

#### 6.1.1 Service Description

The Generic Data Change Notification functions of the NGSI-2 provide a way to receive notification about updates of documents owned by the Service Provider, without the need of an application-usage specific API. The content of the document is opaque to the NGSI component. The Service Provider MAY allow the document to be provided in more than one content type (e.g.: application/xml, application/json, etc.).

#### 6.1.2 Interface definition

The Generic Data Change Notification functions of the NGSI-2 are provided by the interfaces *DataChangeNotificationManager* and *DataChangeNotification*.

##### 6.1.2.1 Interface: DataChangeNotificationManager

The *DataChangeNotificationManager* interface controls the management of subscription to updates of a document.

###### 6.1.2.1.1 Operation: startDataChangeNotification

The invocation of the *startDataChangeNotification* operation allows creating a subscription, in order to receive asynchronous notifications regarding updates to a document.

The *Reference* parameter in the *startDataChangeNotificationRequest* contains:

- the URI of the endpoint where to receive the notifications;
- the interface name;
- a *Correlator* token, used to correlate notifications to the subscription and to issue the *endDataChangeNotificationRequest*.

The *Correlator* field provided in the parameter *Reference* must be unique at the time the subscription is created, otherwise a fault (SVC0005) SHALL be returned.

The subscription lifetime MAY be negotiated between the client and the server. The client MAY propose a duration in the request. The server SHALL include a duration in the response. If the client proposed a duration, the server SHALL assign to the subscription a duration less or equal to the proposed one. The client MAY propose a maximum number of notifications by including a count in the request. The subscription will expire at the end of its duration or after reaching the maximum number of notifications (if the OPTIONAL *Count* parameter is specified), whichever happens first.

The minimum interval between notifications MAY be negotiated between the client and the server. The client MAY propose a frequency in the request. This value specifies a minimum time between notifications. If the client proposed a frequency, the server SHALL assign to the subscription a frequency lower or equal to the proposed one, and include this value in the response. If a frequency is assigned to the subscription, the server SHALL wait the minimum time required before sending notifications. If multiple changes occur to the document during this waiting period, the server SHALL send the latest document version; and if no change occurs to the document during this waiting period, the server MAY send the latest document when it sends the next notification.

The *FullContentRequest* parameter in the *startDataChangeNotificationRequest*:

- SHALL contain a list of the MIME content types supported by the client, in order of preference, with the intention to use one of them on the *Document* parameter in the notifications;
- MAY contain a list of the types of encoding (i.e. compression) supported by the client, with the intention to use one of them on the *Document* parameter in the notifications.

If the *FullContentRequest* parameter is not present, the request asks the server to send notifications without the *Document* parameter. The client can retrieve the updated document with the *getDocumentRequest* operation. Otherwise if the *FullContentRequest* parameter is present, the request asks the server to append the whole updated document to the notification (within the *Document* parameter).

If the *FullContentRequest* parameter is present:

- when none of the content types is supported for the requested document, a fault (POL0011) SHALL be returned;
- when none of the content encodings (if requested by the client) is supported for the requested document, a fault (POL0011) SHALL be returned;
- if no content encoding was provided by the client, the server SHALL NOT encode the document.

#### 6.1.2.1.1.1. Input message: startDataChangeNotificationRequest

| Part name          | Part type              | Optional | Description   |
|--------------------|------------------------|----------|---|
| DocumentId         | xsd:anyURI             | No       | Identifier of the document.   |
| Reference          | common:SimpleReference | No       | Notification endpoint definition.   |
| Count              | xsd:decimal            | Yes      | Number of maximum notification. If not specified there's no limit to the number of notifications.   |
| Duration           | common:TimeMetric      | Yes      | Proposed duration of the subscription.  |
| Frequency          | common:TimeMetric      | Yes      | Proposed maximum frequency of notifications (can also be considered minimum time between notifications).  |
| FullContentRequest | ContentNegotiation     | Yes      | To request notifications containing the whole updated document, this element SHALL be present. It is used to negotiate the content type and possibly the content encoding (i.e. compression) of the <i>Document</i> parameter in the notifications.<br>To request notifications without the updated document, this element SHALL NOT be present |

#### 6.1.2.1.1.2. Output message: startDataChangeNotificationResponse

| Part name | Part type         | Optional | Description   |
|-----------|-------------------|----------|---|
| Duration  | common:TimeMetric | No       | Duration of the subscription as assigned by the server.   |
| Frequency | common:TimeMetric | Yes      | Maximum frequency of notifications as assigned by the server. If a <i>Frequency</i> value were proposed into the <i>startDataChangeNotificationRequest</i> , this parameter SHALL be specified. |

#### 6.1.2.1.1.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0005: Duplicate correlator.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.
- POL0009: Invalid frequency requested.
- POL0011: Media Type not supported.

#### 6.1.2.1.2 Operation: endDataChangeNotification

The invocation of the *endDataChangeNotification* operation allows to cancel a subscription created with the *startDataChangeNotification* operation.

Notifications will continue to be received until a response is received from this operation, or until the subscription expires (see duration and count explanations in Section 6.1.2.1.1).

#### 6.1.2.1.2.1. Input message: endDataChangeNotificationRequest

| Part name  | Part type  | Optional | Description                               |
|------------|------------|----------|---|
| Correlator | xsd:string | No       | Correlator of the subscription to cancel. |

#### 6.1.2.1.2.2. Output message: endDataChangeNotificationResponse

| Part name | Part type | Optional | Description |
|-----------|-----------|----------|-------------|
| None      |           |          |             |

#### 6.1.2.1.2.3. Referenced faults

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

## 6.1.2.2 Interface: DataChangeNotification

The *DataChangeNotification* interface allows receiving notifications about the update of a document.

### 6.1.2.2.1 Operation: dataChangeNotification

This operation allows receiving the notifications about the update of a document on the interface specified by the client in the *startDataChangeNotificationRequest*. The server SHALL send a request for this operation when the document has been modified or deleted. The request is sent to all clients with an active subscription for data change notifications related to the document, depending on count and frequency attributes (see section 6.1.2.1.1).

If the *FullContentRequest* parameter was not present in the *startDataChangeNotificationRequest*, the *Document* parameter SHALL NOT be specified.

If the *FullContentRequest* parameter was present in the *startDataChangeNotificationRequest*, the *Document* parameter SHALL be included. The *DocumentBody* parameter SHALL contain the whole updated document.

#### 6.1.2.2.1.1. Input message: dataChangeNotificationRequest

| Part name          | Part type  | Optional | Description   |
|--------------------|------------|----------|---|
| Correlator         | xsd:string | No       | Correlator provided in request to set up this subscription. |
| Document           | Document   | Yes      | The updated document.                                       |
| DocumentOldVersion | xsd:string | No       | The version of the document <i>before</i> the update.       |
| DocumentVersion    | xsd:string | No       | The version of the document <i>after</i> the update.        |

#### 6.1.2.2.1.2. Output message: dataChangeNotificationResponse

| Part name | Part type | Optional | Description |
|-----------|-----------|----------|-------------|
| None      |           |          |             |

#### 6.1.2.2.1.3. Referenced faults

None.

### 6.1.2.2.2 Operation: dataChangeNotificationError

This operation is used to indicate that a subscription has been cancelled by the server.

**6.1.2.2.2.1. Input message: dataChangeNotificationErrorRequest**

| Part name  | Part type           | Optional | Description   |
|------------|---------------------|----------|---|
| Correlator | xsd:string          | No       | Correlator provided in request to set up this subscription. |
| Reason     | common:ServiceError | No       | Reason the subscription has been cancelled.                 |

**6.1.2.2.2.2. Output message: dataChangeNotificationErrorResponse**

| Part name | Part type | Optional | Description |
|-----------|-----------|----------|-------------|
| None      |           |          |             |

**6.1.2.2.2.3. Referenced faults**

None.

## 7. NGSI-3 Interface: Technical Details

### 7.1 NGSI-3: Group Change Notification

#### 7.1.1 Service Description

The group handling functions of the NGSI-3 interface provides an extension to the service API related to group handling interface descriptions and operations is described in [3GPP TS 29.199-13].

The additional functions provided in NGSI-3 extend the functionality by extending the access permission data and by adding the additional interfaces *GroupNotificationManager* and *GroupNotification* to [3GPP TS 29.199-13].

#### 7.1.2 Data Type Definition

The group handling functions of the NGSI-3 interface uses the data type definition for group handling as defined in [3GPP TS 29.199-13] and [3GPP TS 29.199-1], and defines the additional parameter *NotifyPermission* for *AccessPermissions* structure in 3GPP TS 29.199-13].

##### 7.1.2.1 AccessPermissions structure

| Name             | Type        | Optional | Description  | New parameter          |
|------------------|-------------|----------|--|------------------------|
| AdminPermission  | xsd:boolean | No       | Requester has admin permission for the group   |                        |
| AddPermission    | xsd:boolean | No       | Requester can add members to a group   |                        |
| DeletePermission | xsd:boolean | No       | Requester can delete members from a group  |                        |
| QueryPermission  | xsd:boolean | No       | Requester can query members in a group   |                        |
| NotifyPermission | xsd:boolean | Yes      | Requester can start and stop the notification of addition/deletion of the members in a group, and also the notification of group deletion. | NGSI-3: Group Handling |

#### 7.1.3 Interface definition

The group handling functions of the NGSI-3 provide the additional interfaces *GroupNotificationManager* and *GroupNotification* to [3GPP TS 29.199-13].

##### 7.1.3.1 Interface: GroupNotificationManager

The *GroupNotificationManager* interface controls notification of a group membership change.

###### 7.1.3.1.1 Operation: startMembersAddedNotification

This operation issues the notification to the requester (e.g. application) to inform about adding of new members to a group.

The *Group* parameter specifies the URI of a group.

The *Correlator* field provided in the *Reference* parameter must be unique for the requestor at the time the notification is initiated, otherwise a fault (SVC0005) SHALL be returned.

**7.1.3.1.1.1. Input message: startMembersAddedNotificationRequest**

| Part name | Part type               | Optional | Description   | New Parameter          |
|-----------|-------------------------|----------|---|------------------------|
| Reference | common:Simple Reference | No       | Notification endpoint definition  | NGSI-3: Group Handling |
| Group     | xsd:anyURI              | No       | URI of Group  | NGSI-3: Group Handling |
| Requester | xsd:anyURI              | No       | User wishing to start the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.1.2. Output message: startMembersAddedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.1.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0005: Duplicate correlator

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

**7.1.3.1.2 Operation: stopMembersAddedListNotification**

The application may stop the notifications about adding new members using this operation.

**7.1.3.1.2.1. Input message: stopMembersAddedNotificationRequest**

| Part name  | Part type  | Optional | Description  | New Parameter          |
|------------|------------|----------|--|------------------------|
| Correlator | xsd:string | No       | Correlator of request to stop  | NGSI-3: Group Handling |
| Requester  | xsd:anyURI | No       | User wishing to stop the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.2.2. Output message: stopMembersAddedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.2.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from 3GPP TS 29.199-1 [6]:

- POL0001: Policy error.

**7.1.3.1.3 Operation: startMembersDeletedNotification**

This operation issues the notification about the deletion of members to the requester.

The parameter *Group* specifies the URI of a group.

The *Correlator* field provided in the parameter *Reference* must be unique at the time the notification is initiated, otherwise a fault (SVC0005) SHALL be returned.



**7.1.3.1.3.1. Input message: startMembersDeletedNotificationRequest**

| Part name | Part type               | Optional | Description   | New Parameter          |
|-----------|-------------------------|----------|---|------------------------|
| Reference | common:Simple Reference | No       | Notification endpoint definition  | NGSI-3: Group Handling |
| Group     | xsd:anyURI              | No       | URI of Group  | NGSI-3: Group Handling |
| Requester | xsd:anyURI              | No       | User wishing to start the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.3.2. Output message: startMembersDeletedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.3.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0005: Duplicate correlator

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

**7.1.3.1.4 Operation: stopMembersDeletedListNotification**

The requestor may stop the notification about deleted members using this operation.

**7.1.3.1.4.1. Input message: stopMembersDeletedNotificationRequest**

| Part name  | Part type  | Optional | Description  | New Parameter          |
|------------|------------|----------|--|------------------------|
| Correlator | xsd:string | No       | Correlator of request to stop  | NGSI-3: Group Handling |
| Requester  | xsd:anyURI | No       | User wishing to stop the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.4.2. Output message: stopMembersDeletedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.4.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

**7.1.3.1.5 Operation: startGroupDeletedNotification**

This operation issues the notification to the requester to inform about the deletion of the group.

The parameter *Group* specifies the URI of a group.

The *Correlator* field provided in the parameter *Reference* must be unique at the time the notification is initiated, otherwise a fault (SVC0005) SHALL be returned.

**7.1.3.1.5.1. Input message: startGroupDeletedNotificationRequest**

| Part name | Part type               | Optional | Description   | New Parameter          |
|-----------|-------------------------|----------|---|------------------------|
| Reference | common:Simple Reference | No       | Notification endpoint definition  | NGSI-3: Group Handling |
| Group     | xsd:anyURI              | No       | URI of Group  | NGSI-3: Group Handling |
| Requester | xsd:anyURI              | No       | User wishing to start the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.5.2. Output message: startGroupDeletedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.5.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0005: Duplicate correlator

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

**7.1.3.1.6 Operation: stopGroupDeletedListNotification**

The requestor may stop the notification about deletion of the group using this operation.

**7.1.3.1.6.1. Input message: stopGroupDeletedNotificationRequest**

| Part name  | Part type  | Optional | Description  | New Parameter          |
|------------|------------|----------|--|------------------------|
| Correlator | xsd:string | No       | Correlator of request to stop  | NGSI-3: Group Handling |
| Requester  | xsd:anyURI | No       | User wishing to stop the notification.<br>Normally this is the group / list owner. | NGSI-3: Group Handling |

**7.1.3.1.6.2. Output message: stopGroupDeletedNotificationResponse**

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

**7.1.3.1.6.3. Referenced faults**

ServiceException from [3GPP TS 29.199-1]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from [3GPP TS 29.199-1]:

- POL0001: Policy error.

**7.1.3.2 Interface: GroupNotification**

The *GroupNotification* allows a requester to receive a group member change notification. Three operations are defined:

- The operation *notifyMembersAddedReception* enables to receive a group member addition notification.
- The operation *notifyMembersDeletedReception* enables to receive a group member deletion notification.
  - The operation *notifyGroupDeletedReception* enables to receive a group deletion notification.

### 7.1.3.2.1 Operation notifyMembersAddedReception

A group member addition notification issued by the operation *startMembersAddedNotification* of the *GroupNotificationManager* interface is received by the *notifyMembersAddedReception*.

If nested group support is provided, a member URI may be a reference to the list.

#### 7.1.3.2.1.1. Input message: notifyMembersAddedReceptionRequest

| Part name  | Part type                     | Optional | Description   | New Parameter          |
|------------|-------------------------------|----------|---|------------------------|
| Correlator | xsd:string                    | No       | Correlator provided in request to set up this notification. | NGSI-3: Group Handling |
| Members    | xsd:anyURI<br>[1...unbounded] | No       | Added group members   | NGSI-3: Group Handling |

#### 7.1.3.2.1.2. Output message: notifyMembersAddedReceptionResponse

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

#### 7.1.3.2.1.3. Referenced faults

None.

### 7.1.3.2.2 Operation notifyMembersDeletedReception

A group member deletion notification started by *startMembersDeletedNotification* of the *GroupNotificationManager* interface is received by the operation *notifyMembersDeletedReception*.

If nested group support is provided, a member URI may be a reference to the list.

#### 7.1.3.2.2.1. Input message: notifyMembersDeletedReceptionRequest

| Part name  | Part type                     | Optional | Description   | New Parameter          |
|------------|-------------------------------|----------|---|------------------------|
| Correlator | xsd:string                    | No       | Correlator provided in request to set up this notification. | NGSI-3: Group Handling |
| Members    | xsd:anyURI<br>[1...unbounded] | No       | Deleted group members                                       | NGSI-3: Group Handling |

#### 7.1.3.2.2.2. Output message: notifyMembersDeletedReceptionResponse

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

#### 7.1.3.2.2.3. Referenced faults

None.

### 7.1.3.2.3 Operation notifyGroupDeletedReception

A group deletion notification started by *startGroupDeletedNotification* of the *GroupNotificationManager* interface is received by the operation *notifyGroupDeletedReception*.

#### 7.1.3.2.3.1. Input message: notifyGroupDeletedReceptionRequest

| Part name  | Part type  | Optional | Description   | New Parameter          |
|------------|------------|----------|---|------------------------|
| Correlator | xsd:string | No       | Correlator provided in request to set up this notification. | NGSI-3: Group Handling |

#### 7.1.3.2.3.2. Output message: notifyGroupDeletedReceptionResponse

| Part Name | Part Type | Optional | Description | New Parameter          |
|-----------|-----------|----------|-------------|------------------------|
| None      |           |          |             | NGSI-3: Group Handling |

#### 7.1.3.2.3.3. Referenced faults

None.

## 8. Data Structure definitions

This section describes the data structures for the NGSI Data Configuration and Management part.

### 8.1 ContentNegotiation structure

For operations that may need a negotiation of the requested content, in terms of content type and content encoding, the information required by the negotiation is provided in this data structure.

| Part name       | Part type                     | Optional | Description  |
|-----------------|-------------------------------|----------|--|
| ContentType     | xsd:string<br>[1...unbounded] | No       | This parameter indicates the MIME content types supported by the client, in order of preference, for the DocumentBody. |
| ContentEncoding | xsd:string<br>[0...unbounded] | Yes      | This parameter indicates the types of encoding supported by the client that could be used on the DocumentBody.         |

### 8.2 Document structure

| Part name               | Part type    | Optional | Description   |
|-------------------------|--------------|----------|---|
| ContentType             | xsd:string   | No       | The MIME content type of the DocumentBody.  |
| ContentEncoding         | xsd:string   | Yes      | The type of encoding used on the DocumentBody. If the DocumentBody is encoded (i.e. compressed), this parameter SHALL be specified.   |
| ContentTransferEncoding | xsd:string   | Yes      | Signals the OPTIONAL content transfer encoding (e.g. base64) applied to the DocumentBody.<br><b>Note 1:</b> Note that this parameter is only relevant in those bindings that are not capable of transmitting arbitrary byte sequences.<br><b>Note 2:</b> In those bindings, the type of the used transfer encoding needs to be normatively specified. |
| DocumentBody            | DocumentBody | No       | Document representation according to the ContentType parameter, OPTIONALLY encoded according to the ContentEncoding and ContentTransferEncoding parameters, if present.   |

### 8.3 DocumentBody type

The data type “DocumentBody” denotes a sequence of bytes that represents the result of serializing a document in accordance with a particular MIME content type type which MAY have OPTIONALLY undergone additional encoding steps.

## 9. Fault definitions

New fault definitions for NGSI-1 and NGSI-2.

### 9.1 Fault: Service Exception

#### 9.1.1 SVC0440: Old document version

| Name       | Description  |
|------------|--|
| Message Id | SVC0440  |
| Text       | Requested version does not indicate the latest version of the document on the server, current version is %1. |
| Variables  | %1 – current document version on the server.   |

### 9.2 Fault: Policy Exception

#### 9.2.1 SVC0460: Unknown document type

| Name       | Description                               |
|------------|---|
| Message Id | SVC0460                                   |
| Text       | The server cannot infer the DocumentType. |
| Variables  | None.                                     |

## Appendix A. Change History

(Informative)

### A.1 Approved Version History

| Reference   | Date        | Description  |
|---|-------------|--|
| OMA-TS-NGSI_Data_Configuration_and_Management-V1_0-20120529-A | 29 May 2012 | Status changed to Approved by TP<br>Ref TP Doc # OMA-TP-2012-0203-INP_NGSI_V1_0_ERP_for_final_Approval |

## Appendix B. Static Conformance Requirements (Normative)

As NGSI v1.0 specifies the level of abstract interfaces, no testing of those is applicable. Therefore, the Static Conformance Requirements (SCR) tables are not defined. Those are subject for definitions in the related technical specification defining the bindings.

The notation used in this appendix is specified in [SCRRULES].

### B.1 SCR for XYZ Client

None.

### B.2 SCR for XYZ Server

None.