

**Open Service Access (OSA);
Parlay X Web Services;
Part 17: Application-driven Quality of Service (QoS);
(Parlay X 3)**



Reference

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Keywords

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 17 of a multi-part deliverable covering Open Service Access (OSA); Parlay X 3 Web Services, as identified below:

- Part 1: "Common";
- Part 2: "Third Party Call";
- Part 3: "Call Notification";
- Part 4: "Short Messaging";
- Part 5: "Multimedia Messaging";
- Part 6: "Payment";
- Part 7: "Account Management";
- Part 8: "Terminal Status";
- Part 9: "Terminal Location";
- Part 10: "Call Handling";
- Part 11: "Audio Call";
- Part 12: "Multimedia Conference";
- Part 13: "Address List Management";
- Part 14: "Presence";
- Part 15: "Message Broadcast";
- Part 16: "Geocoding";
- Part 17: "Application-driven Quality of Service (QoS)";**
- Part 18: "Device Capabilities and Configuration";
- Part 19: "Multimedia Streaming Control";
- Part 20: "Multimedia Multicast Session Management".

The present document has been defined jointly between ETSI, The Parlay Group (<http://www.parlay.org>) and the 3GPP.

The present document forms part of the Parlay X 3.0 set of specifications.

The present document is equivalent to 3GPP TS 29.199-17 V7.0.2 (Release 7).

1 Scope

The present document is part 17 of the Stage 3 Parlay X 3 Web Services specification for Open Service Access (OSA).

The OSA specifications define an architecture that enables application developers to make use of network functionality through an open standardized interface, i.e. the OSA APIs.

The present document specifies the Application-driven Quality of Service (QoS) Web Service. The following are defined here:

- Name spaces.
- Sequence diagrams.
- Data definitions.
- Interface specification plus detailed method descriptions.
- Fault definitions.
- Service Policies.
- WSDL Description of the interfaces.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] W3C Recommendation (2 May 2001): "XML Schema Part 2: Datatypes".

NOTE: Available at <http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>.

- [2] ETSI ES 202 504-1: "Open Service Access (OSA); Parlay X Web Services; Part 1: Common (Parlay X 3)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 202 504-1 [2] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ES 202 504-1 [2] and the following apply:

ADQ	Application-Driven Quality of Service
QoS	Quality of Service

4 Detailed service description

'Application Driven QoS ' is a service which enables applications to dynamically change the quality of service (e.g. bandwidth) available on end user network connections. Changes in QoS may be applied on either a temporary basis (i.e. for a defined period of time), or as the default QoS to be applied for a user each time they connect to the network.

Applications will govern the quality of service available to the end user by requesting that pre-defined QoS Feature profiles are applied on the end user's connection. It is the responsibility of the Service Provider to define these QoS Features and share them beforehand with application providers, along with a clear indication as to which of these can be used as temporary QoS Features and which can be used to set the default QoS on an end user connection.

The following scenarios provide example business use-cases to further illustrate the difference between default and temporary QoS Features and when they may be applied by the application.

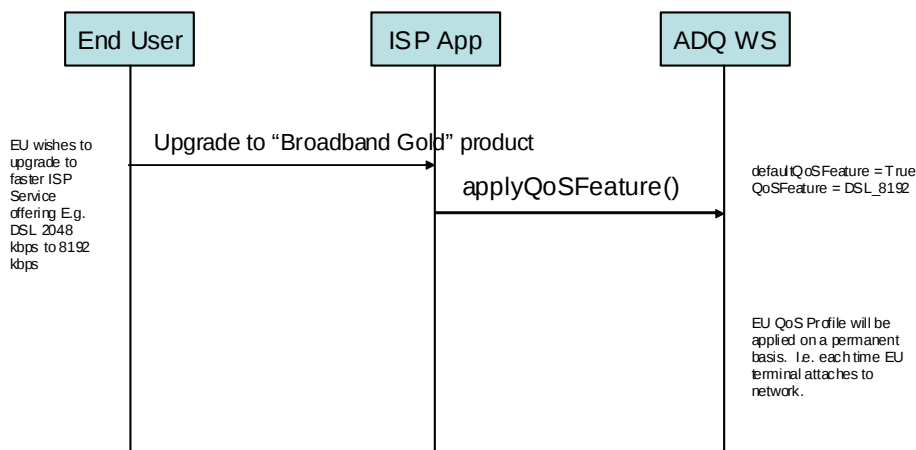


Figure 4.1: Example Default QoS Feature Use-Case

Figure 4.1 provides an example of where a default QoS Feature could be applied to an end user connection. The scenario given shows the end user of a DSL service requesting a permanent upgrade from their existing service offering (e.g. 2048 kbps) to a higher bandwidth service (e.g. 8192 kbps). The application subsequently makes a request to the ADQ web service to apply the pre-defined 'DSL_8192' QoS Feature to the end user connection on a permanent, or default, basis. Following successful completion of this use-case, each time the end user's terminal equipment attaches to their DSL service, the default QoS (in this case DSL_8192) will be applied.

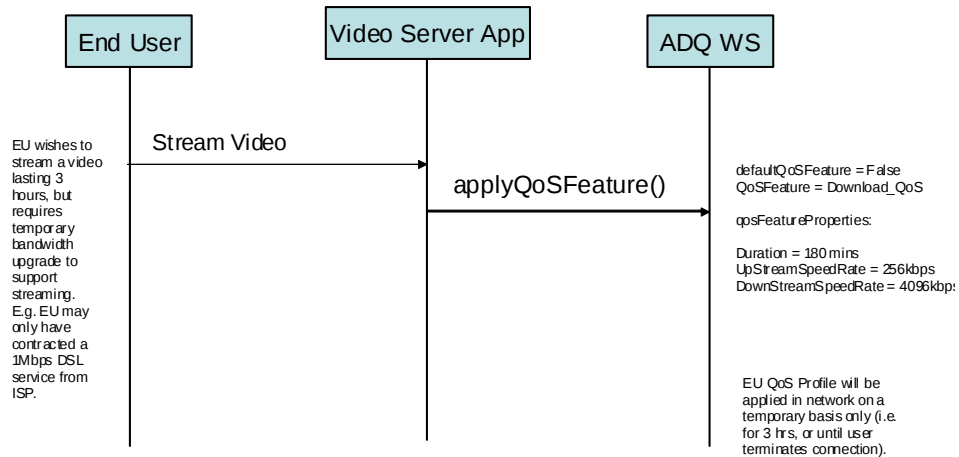


Figure 4.2: Example Temporary QoS Feature Use-Case

Figure 4.2 provides an example of where a temporary QoS Feature could be applied to an end user connection. The scenario given shows an end user of a DSL service who wishes to stream a piece of video content. Their current service offering (e.g. 1024 kbps DSL) however will not support video streaming and hence they require a temporary bandwidth upgrade for the duration of the video stream. The streaming application then makes a request to the ADQ web service to apply the pre-defined 'Download_QoS' QoS Feature to the end user connection, specifying the upstream and downstream bandwidth rate and the duration for which the temporary QoS Feature should be applied. Assuming that the network supports the requested bandwidth rate, the end user's bandwidth will be increased to the rate requested by the application for the specified duration. Once the requested duration has expired, the end user's service will resume to their original (in this example 1024 kbps bandwidth) QoS.

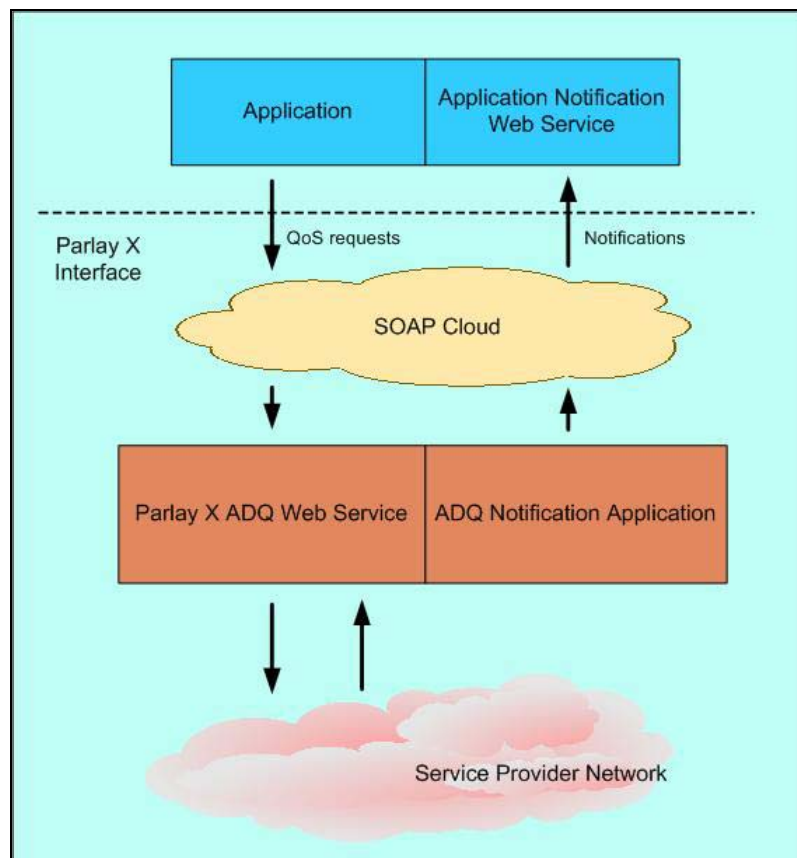


Figure 4.3: ADQ Web Service

The ADQ service is enabled as a Web Service interface, as depicted in figure 4.3, and will accept four logical kinds of requests from the Applications viz.:

- Requests to change the default quality of service available on the end user's connection,
- Requests to change the quality of service available on the end user's connection on a temporary basis,
- Requests to manage event registrations and
- Self-care requests.

Applications can register with the service for notifications about network events that affect the quality of service temporarily configured on the end user's connection. Whenever such events occur, the Service generates notifications to inform Applications about the impact that these events had on the temporary QoS features set up on the end user's connection.

Self-care requests enable Applications to view transaction history and current quality of service status.

5 Namespaces

The ApplicationQoS interface uses the namespace:

`http://www.csapi.org/wsdl/parlayx/adq/v3_0`

The ApplicationQoSImpactNotificationManager interface uses the namespace:

`http://www.csapi.org/wsdl/parlayx/adq/notification_manager/v3_0`

The ApplicationQoSImpactNotification uses the namespace:

`http://www.csapi.org/wsdl/parlayx/adq/notification/v3_0`

The data types are defined in the namespace:

`http://www.csapi.org/schema/parlayx/adq/v3_0`

The 'xsd' namespace is used in the present document to refer to the XML Schema data types defined in XML Schema [1]. The use of the name 'xsd' is not semantically significant.

6 Sequence diagrams

6.1 Interface Flow overview

The sequence diagrams show the interaction where the Application Provider has a Web Service compliant Application capable of sending requests to the service and receiving notifications from the service.

Every method defined in the interface is synchronous, in the sense, that the response to the request is instantaneous and contains the status of the request. There is no polling required on part of the Application to determine the status of a request.

Notifications are unsolicited. The Application will indicate their interest in receiving notifications by registering for events. When an event occurs in the network that merits a notification to be raised, interested Applications will receive a notification and its implications on the temporary QoS features active on the end user connection.

The sequence diagrams do not show the internal logic within the server implementing this service, which is required for processing the requests. It is assumed that such a server is capable of interacting with the network to service requests sent by the Application.

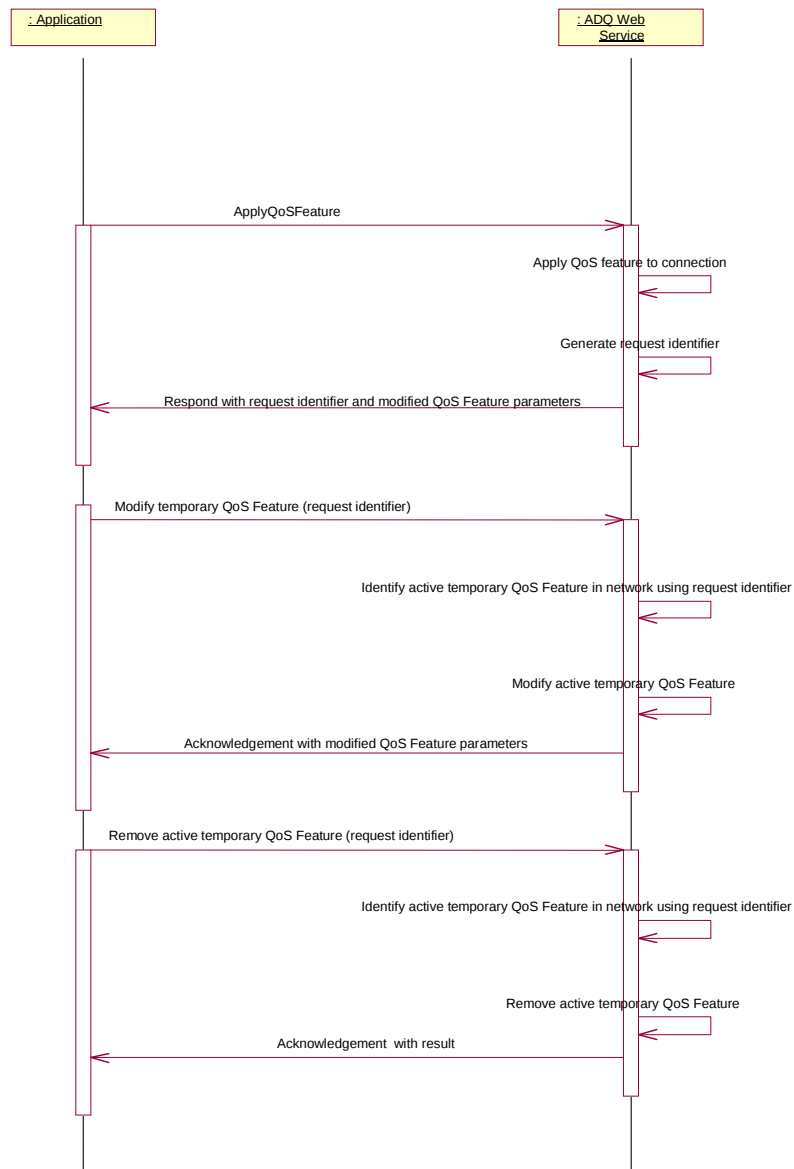


Figure 6.1.1

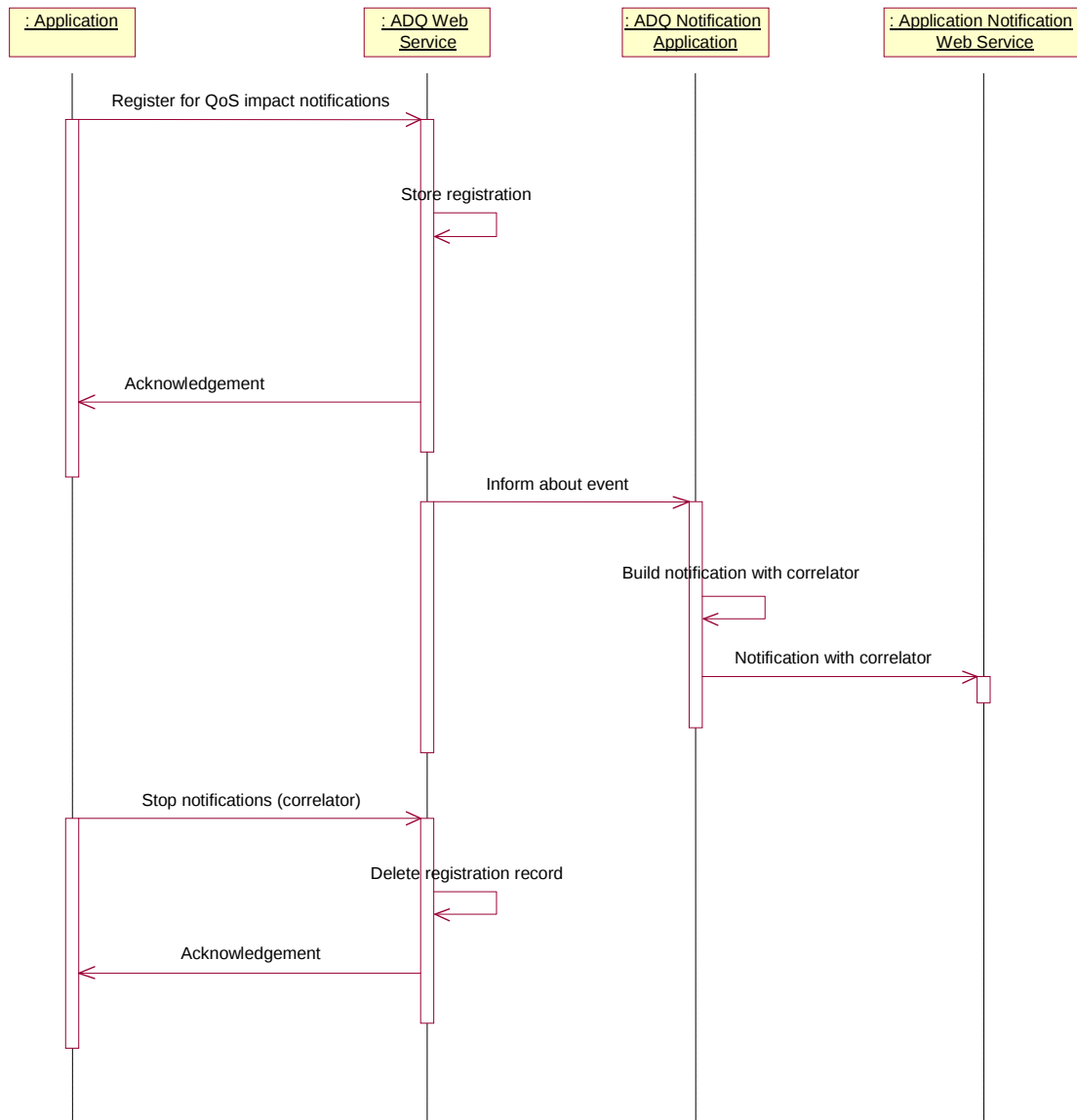


Figure 6.1.2

7 XML Schema data type definition

7.1 QoSFeatureProperties structure

Element name	Element type	Optional	Description
duration	common:TimeMetric	Yes	e.g. "15 minutes"
upStreamSpeedRate	xsd:string	Yes	e.g. "256 kbps"
downStreamSpeedRate	xsd:string	Yes	e.g. "1.5 Mbps".
otherProperties	Property [0..unbounded]	Yes	Additional configurable properties relating to the QoS Feature which may be specified by the service provider and hence not defined in this specification.

7.2 Property structure

Property with a name and value. May be used to specify service configurable QoSFeatureProperties or additional search criteria for filtering QoS history transactions.

Element name	Type	Optional	Description
name	xsd:string	No	Name of property
value	xsd:string	No	Value of property

7.3 QoSFeatureData structure

Uniquely identifies the temporary QoS feature instance that is currently active on the end user connection, and any additional parameter values.

Element name	Element type	Optional	Description
requestID	xsd:string	No	Contains a unique request identifier generated by the Web Service, which can be used by the application to identify this specific invocation to the applyQoSFeature operation.
qoSFeatureIdentifier	xsd:string	No	Uniquely identifies the QoS feature that was applied on a temporary basis to the end user connection
actualProperties	QoSFeatureProperties	Yes	Contains the current value of the configurable service attributes. Note: Values may be altered by the service from those stated in the original applyQoSFeature request if they do not fit the service definition of the QoS Feature.

7.4 QoSStatus structure

The status of an end user connection, including information about the temporary QoS features that are currently activated

Element name	Element type	Optional	Description
userIsConnected	xsd:boolean	No	Specifies whether the user is connected (i.e. online) or not connected (i.e. offline)
defaultQoSFeatureIdentifier	xsd:string	Yes	The default QoS feature that is currently applied to the end user connection. Do not specify if no default feature is applied.
trafficClasses	TrafficClass [0..unbounded]	Yes	The traffic classes supported in this end user connection including the speed rates that these traffic classes support.
qosFeatureStatuses	QoSFeatureData [0..unbounded]	Yes	The array containing status of every temporary QoS feature that is currently active on the end user connection

7.5 TrafficClass structure

Information about the traffic class supported on an end user connection

Element name	Element type	Optional	Description
trafficClassName	xsd:string	No	Name of the traffic class
maxUpstreamRate	xsd:int	No	The applicable maximum speed rate in the upstream direction for this traffic class
maxDownstreamRate	xsd:int	No	The applicable maximum speed rate in the downstream direction for this traffic class

7.6 QoSHistory structure

Information about individual transactions retrieved as part of the historical QoS FeatureData

Element name	Element type	Optional	Description
transactionDateTime	xsd:dateTime	No	Identifies when the transaction occurred
transactionDetails	xsd:string	No	The details of the transaction

7.7 QoSEvent enumeration

Specifies the events that may occur on any active QoS features on the end user connection(s).

Enumeration Value	Description
AbnormalConnectionTermination	End user connection(s) terminated abnormally because of a fault in the network causing all the temporary QoS features that were active on the connection(s) to be released as well.
NormalConnectionTermination	End user connection(s) terminated normally – e.g. user(s) have logged off – causing all temporary QoS features active on the connection(s) to be automatically released.
TemporaryQoSFeatureReleased	A temporary QoS feature that was active on an end user connection has been released because the threshold set by one of the service attributes (e.g. elapsed duration) has been reached.

8 Web Service interface definition

8.1 Interface: ApplicationQoS

This interface provides methods for:

- Applying a new QoS feature to an end user connection. Either:
 - rapidly provisioning a re-grade, which results in a permanent change in the class of service provided over the end user connection.
 - dynamically controlling temporary QoS features in the network which will be active for a specified period of time.
- Modifying an active temporary QoS Feature on an end user connection.
- Self-care like operations.

8.1.1 Operation: applyQoSFeature

This method is used by an Application to request either a temporary or a default QoS feature to be set up on the end user connection.

The **defaultQoSFeature** parameter identifies if the requested QoS Feature is to be applied to the end user connection as the default (i.e. long-lived) QoS Feature or, if this parameter is set to false, the requested QoS Feature shall be applied on a temporary basis only.

Note that there is no session associated with a default QoS Feature, as it is the permanent default QoS Feature associated with the connection until it is replaced. A default QoS feature governs the traffic flow on the end user connection whenever there are no temporary QoS features active on the connection. If a default QoS Feature is replaced by an Application, it can potentially affect other Applications, which may require a certain level of QoS to be available on the connection when there are no active temporary QoS Features. To achieve this, the service implementation should allow only a Super Application (e.g. Service Provider owned) to change the default QoS Feature of a connection. The authorization scheme required for allowing this facility is service implementation specific and is not covered in the scope of this specification.

For default QoS Feature requests, the value of the **modifyExistingSession** parameter should be taken into account before applying the default QoS Feature to the end user connection. Default QoS Features will not have any configurable parameters.

8.1.1.1 Input message: applyQoSFeatureRequest

Part name	Part type	Optional	Description
endUserIdentifier	xsd:anyURI	No	Identifies the end user in the network
qoSFeatureIdentifier	xsd:string	No	Identifies the QoS feature that is applied to the end user connection - e.g. "Gold724"
defaultQoSFeature	xsd:boolean	No	Specifies whether the requested QoS Feature is to be applied as the default QoS Feature on an end users connection.
modifyExistingSession	xsd:boolean	Yes	Only required where defaultQoSFeature = TRUE. Specifies whether the default QoS feature should be applied to the ongoing connection of the end user or to the subsequent connection when the end user next comes online.
qoSFeatureProperties	QoSFeatureProperties	Yes	Not required for a default QoS Feature request – i.e. where defaultQoSFeature = True. Optional for a temporary QoS Feature request. Specifies values for the configurable service attributes that govern the temporary QoS feature (e.g. Duration)

8.1.1.2 Output message: applyQoSFeatureResponse

Part name	Part type	Optional	Description
result	QoSFeatureData	Yes	Only returned for a temporary QoS Feature request – i.e. where defaultQoSFeature = FALSE Returns the result of the request to add the temporary QoS feature.

8.1.1.3 Referenced faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value
- SVC0340: Insufficient connection resources
- SVC0341: Unknown QoS feature identifier
- SVC0342: End User is not online
- SVC0343: Specified and existing temporary QoS features conflict
- SVC0344: QoS Feature cannot be applied as default

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.1.2 Operation: modifyQoSFeature

This method will be used to alter the configurable service attributes (e.g. duration) of an active temporary QoS feature instance.

8.1.2.1 Input message: modifyQoSFeatureRequest

Part name	Part type	Optional	Description
requestID	xsd:string	No	Contains the unique request identifier generated by the Web Service, in response to the invocation of the original applyQoSFeature operation
requestProperties	QoSFeatureProperties	No	Specifies new values for the service attributes that govern the temporary QoS feature instance (e.g. Duration). The values of other service attributes, i.e. which are not specified in this request message, remain unchanged.

8.1.2.2 Output message: modifyQoSFeatureResponse

Part name	Part type	Optional	Description
result	QoSFeatureProperties	No	Returns the modified values of the configurable service attributes

8.1.2.3 Referenced faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value
- SVC0340: Insufficient connection resources
- SVC0341: Unknown QoS feature identifier
- SVC0342: End User is not online

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.1.3 Operation: removeQoSFeature

This method will be used by the Applications to release a temporary QoS Feature, which is currently active on the end user connection.

8.1.3.1 Input message: removeQoSFeatureRequest

Part name	Part type	Optional	Description
requestID	xsd:string	No	Contains the unique request identifier generated by the Web Service, in response to the invocation of the original applyQoSFeature operation.

8.1.3.2 Output message: removeQoSFeatureResponse

Part name	Part type	Optional	Description
result	xsd:boolean	No	Boolean flag indicating whether the QoS Feature was successfully removed (True) or not (False) from the end user connection.

8.1.3.3 Referenced faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value
- SVC0342: End User is not online

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.1.4 Operation: getQoSStatus

This method falls in the category of a self-care and will be used to retrieve the status of an end user connection. The response to this method will contain information about the characteristics of the end user connection including information about the temporary QoS features that are currently active on the end user connection.

8.1.4.1 Input message: getQoSStatusRequest

Part name	Part type	Optional	Description
endUserIdentifier	xsd:anyURI	No	Identifies the end user in the network

8.1.4.2 Output message: getQoSStatusResponse

Part name	Part type	Optional	Description
result	QoSStatus	No	Returns the status of an end user connection, including information about the temporary QoS features that are currently activated

8.1.4.3 Referenced Faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.1.5 Operation: getQoSHistory

This method will return an historical list of all QoS transactions previously requested against an end user's connection. The transactions to be returned may be filtered by specifying a QoS Feature identifier, a maximum number of transactions, a date / time limit, or additional filter criteria defined by the service provider.

8.1.5.1 Input message: getQoSHistoryRequest

Part name	Part type	Optional	Description
endUserIdentifier	xsd:anyURI	No	Identifies the end user in the network
qosFeatureIdentifier	xsd:string	Yes	Allows the transaction history to be filtered by QoS Feature Identifier
date	xsd:dateTime	Yes	This part specifies the date and time from which the transaction history should be returned. If this part is not present, the current date and time will be used as defined by the service policy
maxEntries	xsd:int	Yes	This part indicates the maximum number of entries that shall be returned. If this part is not present, or a value of zero is specified, then the maximum is determined according to the web service's policy
additionalCriteria	Property [0..unbounded]	Yes	Allows additional criteria/filters to be applied, as specified by the service provider

8.1.5.2 Output message: getQoSHistoryResponse

Part name	Part type	Optional	Description
result	QoSHistory [0..unbounded]	Yes	Returns the historical list (filtered by the supplied search criteria) of QoS transactions applied to a specified end user connection.

8.1.5.3 Referenced Faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.2 Interface: ApplicationQoSNotificationManager

This interface is used by the Applications to manage their registration for notifications.

8.2.1 Operation: startQoSNotification

This method will be used by the Application to register their interest in receiving notifications of a specific event type(s) in context of specific end users.

The correlator provided in the reference must be unique for this Web Service at the time the notification is initiated, otherwise a ServiceException (SVC0005) will be returned to the application.

8.2.1.1 Input message: startQoSNotificationRequest

Part name	Part type	Optional	Description
reference	common:SimpleReference	No	Notification end point definition at which the Application wishes to receive the event notification
endUserIdentities	xsd:anyURI [1..unbounded]	No	The end user(s) in the network to monitor for events
events	QoSEvent [1..unbounded]	No	The events to be monitored

8.2.1.2 Output message: startQoSNotificationResponse

Part name	Part type	Optional	Description
None			

8.2.1.3 Referenced faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value
- SVC0005: Duplicate Correlator
- SVC0008: Overlapping Criteria

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.2.2 Operation: stopQoSNotification

This method will be used by the Applications to stop receiving notifications by cancelling an existing registration.

8.2.2.1 Input message: stopQoSNotificationRequest

Part name	Part type	Optional	Description
correlator	xsd:string	No	Correlator identifying the original registration

8.2.2.2 Output message: stopQoSNotificationResponse

Part name	Part type	Optional	Description
None			

8.2.2.3 Referenced faults

ServiceException from ES 202 504-1 [2]:

- SVC0001: Service error
- SVC0002: Invalid input value

PolicyException from ES 202 504-1 [2]:

- POL0001: Policy error

8.3 Interface: ApplicationQoSNotification

This interface provides the methods for notifying the Application about the impact of certain events on QoS features that were active on the end user connection when these events occurred.

8.3.1 Operation: notifyQoSEvent

This notification will report a network event that has occurred against end user(s) active QoS features.

8.3.1.1 Input message: notifyQoSEventRequest

Part name	Part type	Optional	Description
correlator	xsd:string	No	Correlator identifying the original registration
endUserIdentities	xsd:anyURI [1..unbounded]	No	The end user(s) in the network associated with the event
eventType	QoSEvent	No	The event that is being reported

8.3.1.2 Output message: notifyQoSEventResponse

Part name	Part type	Optional	Description
None			

8.3.1.3 Referenced faults

None.

9 Fault definitions

The following faults are defined for this service.

9.1 ServiceException

9.1.1 SVC0340: Insufficient Connection Resources

Name	Description
messageld	SVC0340
text	Insufficient connection resources to fulfil the request
variables	None

9.1.2 SVC0341: Unknown QoS Feature Identifier

Name	Description
messageld	SVC0341
text	Unknown QoS Feature Identifier
variables	None

9.1.3 SVC0342: End User Is Not Online

Name	Description
messageld	SVC0342
text	End user is not online
variables	None

9.1.4 SVC0343: Specified And Existing Temporary QoS Features Conflict

Name	Description
messageld	SVC0343
text	Specified and existing temporary QoS features conflict
variables	None

9.1.5 SVC0344: QoS Feature Cannot Be Applied As Default

Name	Description
messageId	SVC0344
text	Specified QoS Feature cannot be applied as a default QoS Feature
variables	None

10 Service policies

Service policies for this service.

Name	Type	Description
DefaultTransactionHistoryTime	xsd:dateTime	Default time to be used when a date / time is not supplied in the getQoSHistory request
MaxHistoricalTransactions	xsd:int	Maximum number of historical QoS transactions to be returned by the getQoSHistory request.

Annex A (normative): WSDL for Application-driven QoS

The document/literal WSDL representation of this interface specification is compliant to ES 202 504-1 [2] and is contained in text files (contained in archive es_20250417v010101p0.zip) which accompany the present document.

Annex B (informative): Bibliography

ETSI TR 121 905: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Vocabulary for 3GPP Specifications (3GPP TR 21.905)".

History

Document history		
V1.1.1	February 2008	Membership Approval Procedure MV 20080425: 2008-02-26 to 2008-04-25
V1.1.1	May 2008	Publication