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1 Scope

The present document specifies the stage 3 protocol and data model for PIN-9 interface between the PIN application server and PIN server. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the PIN server over PIN-9 interface. The stage 2 functional requirements are defined in 3GPP TS 23.542 [10].

2 References

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

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- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 29.122: "T8 reference point for Northbound Application Programming Interfaces (APIs)".
- [3] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [4] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.
- [5] 3GPP TR 21.900: "Technical Specification Group working methods".

- [6] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".
- [7] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".
- [8] 3GPP TS 33.122: "Security aspects of Common API Framework (CAPIF) for 3GPP northbound APIs".
- [9] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [10] 3GPP TS 23.542: "Application layer support for Personal IoT Network".
- [11] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [12] 3GPP TS 24.526: "User Equipment (UE) policies for 5G System (5GS); Stage 3".

3 Definitions and abbreviations

3.1 Definitions

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

Personal IoT Network (PIN): A configured and managed group of PIN Element(s) that are able to communicate with each other directly, communicate with each other via PIN Element(s) with Gateway Capability (i.e. PEGC(s)), or use a PEGC to communicate with devices or servers that are outside of the PIN via the 5G network. A PIN includes at least

one PEGC and is managed by PIN Element(s) with Management Capability (i.e. PEMC(s)) with the support by an AF if AF is deployed.

PIN Element with Gateway Capability (PEGC): A PIN Element with the ability to provide DN connectivity via the 5G network for other PIN Elements and/or is able to provide relay functionality for communication between PIN Elements. Only a UE is able to act as a PEGC.

3.2 Abbreviations

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

PAS	PIN Application Server
PEGC	PIN Element with Gateway Capability
PIN	Personal IoT Network
PINAPP	Personal IoT Network Application

4 Overview

The Personal IoT Network (PIN) Server forms part of the Application layer support for Personal IoT Networks defined in 3GPP TS 23.542 [10]. It is aimed to support the server-side functionalities required for managing the PIN. The PIN Server provides the following functionalities:

- support PAS registration management procedure (see clause 5.2);
- support PAS service switch subscription procedure (see clause 5.3); and
- support PAS service continuity subscription procedure (see clause 5.4).

Figure 4-1 shows the reference point representation of the architecture for Personal IoT Network Application.

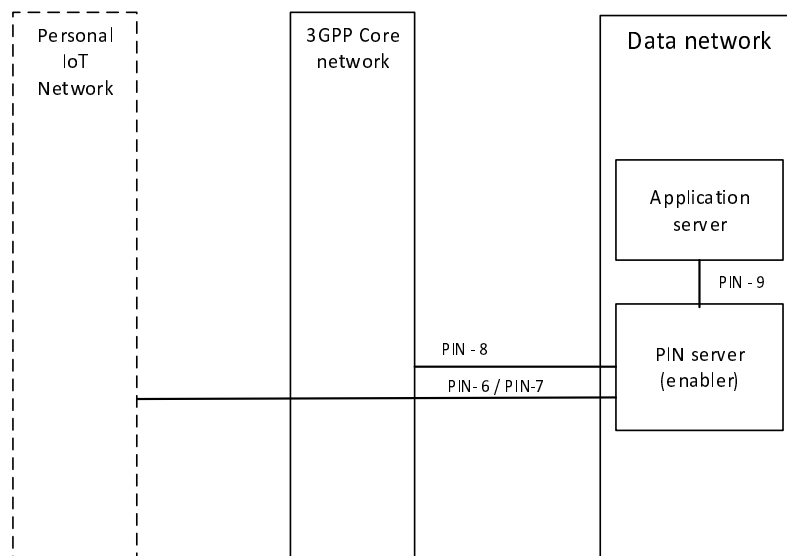


Figure 4-1: PINAPP architecture

PIN-9 reference point exists between the application server and PIN server for the interactions related to enabling PINAPP.

5 Services offered by PIN Server

5.1 Introduction

The PIN Server provides the following services:

- PIN_ASRegistration
- PIN_ASServiceSwitch
- PIN_ASServiceContinuity

Table 5.1-1 summarizes the corresponding APIs defined in this specification.

Table 5.1-1: PIN server API Descriptions

Service Name	Clause	Description	OpenAPI Specification File	API Name	Annex
PIN_ASRegistration	5.2	Service for AS registration	TS29583_PIN_ASRegistration.yaml	pin-as-registration	A.2
PIN_ASServiceSwitch	5.3	Service for reporting service switch	TS29583_PIN_ASServiceSwitch.yaml	pin-as-serviceswitch	A.3
PIN_ASServiceContinuity	5.4	Service for reporting service continuity	TS29583_PIN_ASServiceContinuity.yaml	pin-as-servicecontinuity	A.4

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the PIN Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

5.2 PIN_ASRegistration Service

5.2.1 Service Description

The PIN_ASRegistration API exposed by the PIN Server enables a service consumer to:

- create/update/delete a PAS Registration.

5.2.2 Service Operations

5.2.2.1 Introduction

The service operation defined for PIN_ASRegistration API is shown in the table 5.2.2.1-1.

Table 5.2.2.1-1: Operations of the PIN_ASRegistration API

Service operation name	Description	Initiated by
PIN_ASRegistration_Request	This service operation is used by the service consumer to register to the PIN server.	e.g. PAS
PIN_ASRegistration_Update	This service operation is used by the service consumer to update the registration information to the PIN server.	e.g. PAS
PIN_ASRegistration_Deregister	This service operation is used by the service consumer to deregister from the PIN server.	e.g. PAS

5.2.2.2 PIN_ASRegistration_Request

5.2.2.2.1 General

This service operation is used by the PAS to register to a PIN server.

5.2.2.2.2 PAS Registration Creation

Figure 5.2.2.2.2-1 depicts a scenario where a service consumer sends a request to the PIN Server to request the creation of the PAS Registration.

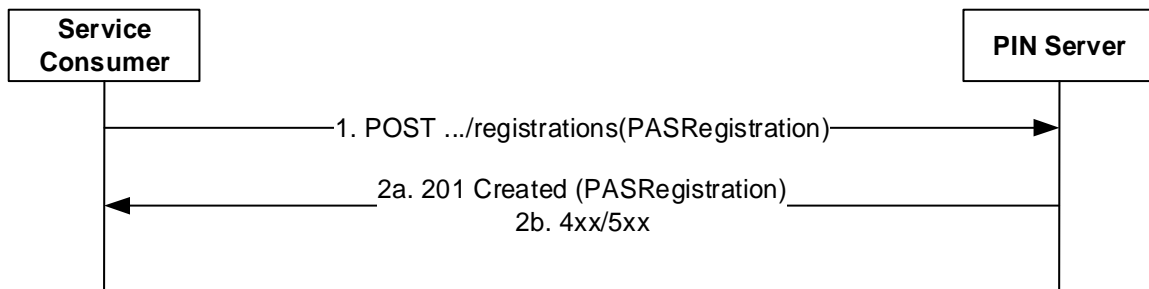


Figure 5.2.2.2.2-1: Procedure for PAS Registration Creation

1. In order to request the creation of the PAS Registration to the PIN server, the service consumer shall send the HTTP POST request request to the PIN Server targeting the URI of the "PAS Registrations" collection resource, with the request body including the PASRegistration data structure.
- 2a. Upon success, the PIN Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual PAS Registration" resource within the PASRegistration data structure.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

5.2.2.3 PIN_ASRegistration_Update

5.2.2.3.1 General

This service operation is used by the service consumer to update the registration information at a given PIN server.

5.2.2.3.2 Updating an existing Registration

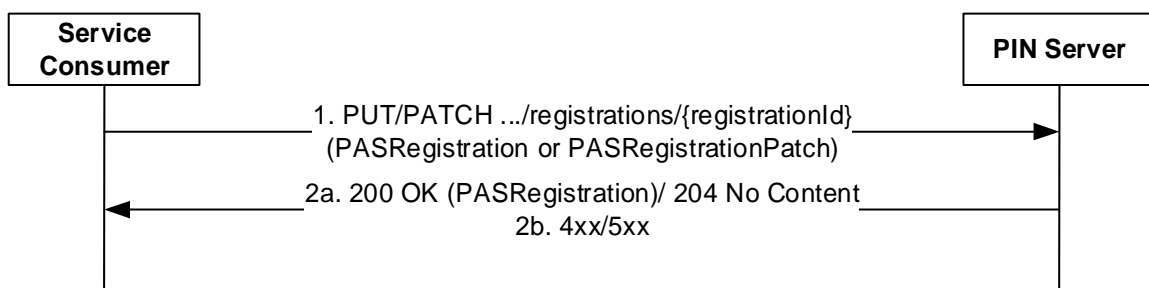


Figure 5.2.2.3.2-1: Procedure for update of a registration

1. In order to update an existing registration information, the service consumer shall send the HTTP PUT/PATCH request to the PIN server, targeting the URI of the corresponding "Individual PAS Registration" collection resource, with the request body either:

- the updated representation of the resource within the PASRegistration data structure, in case the HTTP PUT method is used; or
- the requested modifications to the resource within the PASRegistrationPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the PIN server shall updated the targeted "Individual PAS Registration" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual PAS Registration" resource within the PASRegistration data structure; or
- an HTTP "204 No Content" status code.

2b. On failure, the PIN server shall send the error response as specified in clause 6.1.7.

5.2.2.4 PIN_ASRegistration_Deregister

5.2.2.4.1 General

This service operation is used by the service consumer to deregister itself from a given PIN server.

5.2.2.4.2 Deregistering the Registration

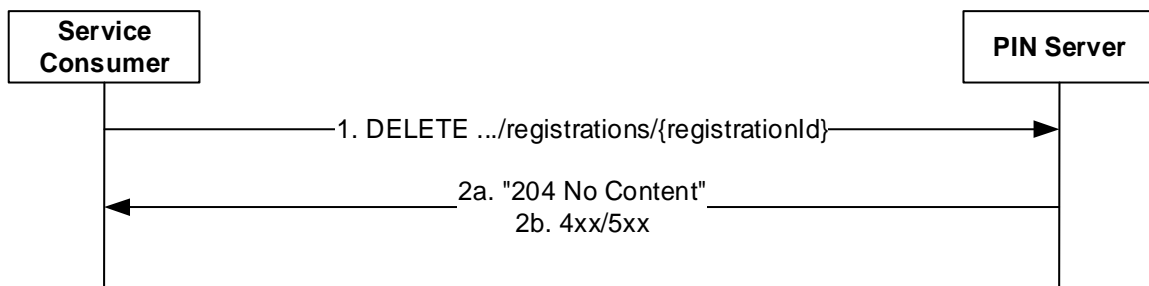


Figure 5.2.2.4.2-1: Procedure for Deregistering the Registration

1. In order to request the deletion of an existing PAS registration information, the service consumer shall send an HTTP DELETE request to the PIN server targeting the corresponding "Individual PAS Registration" resource.
- 2a. Upon success, the PIN server shall respond with an HTTP "204 No Content" status code.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.1.7.

5.3 PIN_ASServiceSwitch Service

5.3.1 Service Description

The PIN_ASServiceSwitch API exposed by the PIN Server enables a service consumer to:

- create/update/delete a Service Switch Information Subscription; and
- receive Service Switch Information Notifications;

5.3.2 Service Operations

5.3.2.1 Introduction

The service operation defined for PIN_ASServiceSwitch API is shown in the table 5.3.2.1-1.

Table 5.3.2.1-1: Operations of the PIN_ASServiceSwitch API

Service operation name	Description	Initiated by
PIN_ASServiceSwitch_Subscribe	This service operation enables a service consumer to create/update/delete a Service Switch Information Subscription.	e.g., PAS
PIN_ASServiceSwitch_Notify	This service operation enables a service consumer to receive the Service Switch Information Notifications.	PIN server

5.3.2.2 PIN_ASServiceSwitch_Subscribe

5.3.2.2.1 General

This service operation is used by the service consumer to request the creation of a Service Switch information.

5.3.2.2.2 Service Switch Information Subscription Creation

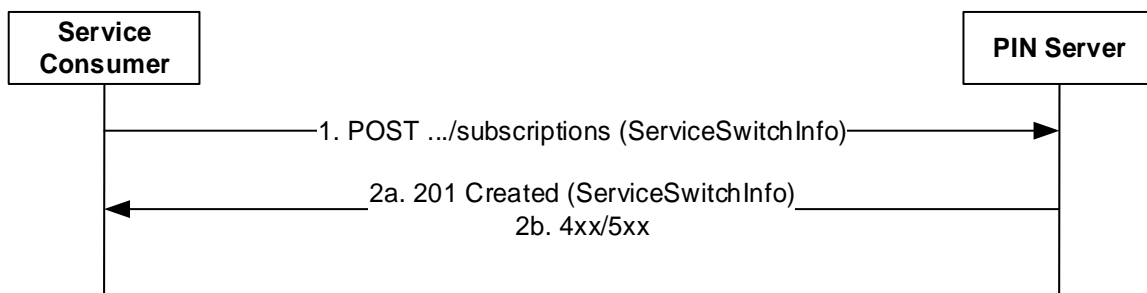


Figure 5.3.2.2.2-1: Procedure for PAS Subscription Creation

1. In order to subscribe to service switch information reporting, the service consumer shall send the HTTP POST request message to the PIN Server targeting the URI of the "Service Switch Information Subscriptions" collection resource, with the request body including the ServiceSwitchInfo data structure.
- 2a. Upon success, the PIN Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Service Switch Information Subscription" resource within the ServiceSwitchInfo data structure.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

5.3.2.3 PIN_ASServiceSwitch_Notify

5.3.2.3.1 General

This service operation is used by the PIN server to notify a previously subscribed service consumer on:

- the service switch information.

The following procedures are supported by the "PIN_ASServiceSwitch_Notify" service operation:

- Service Switch Information Notification.

5.3.2.3.2 Service Switch Information Notification

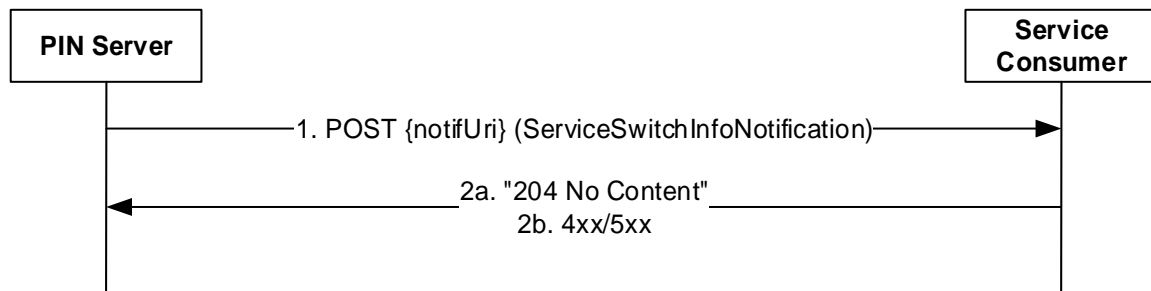


Figure 5.3.2.3.2-1: Procedure for Service Switch Information Notification

1. In order to notify a previously subscribed service consumer on the service switch information, the service consumer shall send the HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Service Switch Information Subscription using the procedures defined in clauses 5.3.2.2 and 5.3.2.4, with the request body including the ServiceSwitchInfoNotification data structure.
- 2a. Upon success, the service consumer shall respond to the PIN server with "204 No Content" status code to acknowledge the reception of the notification.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

5.3.2.4 PIN_ASServiceSwitch_Update

5.3.2.4.1 General

This service operation is used by the service consumer to update a service switch subscription with the PIN Server.

5.3.2.4.2 Service Switch Information Update

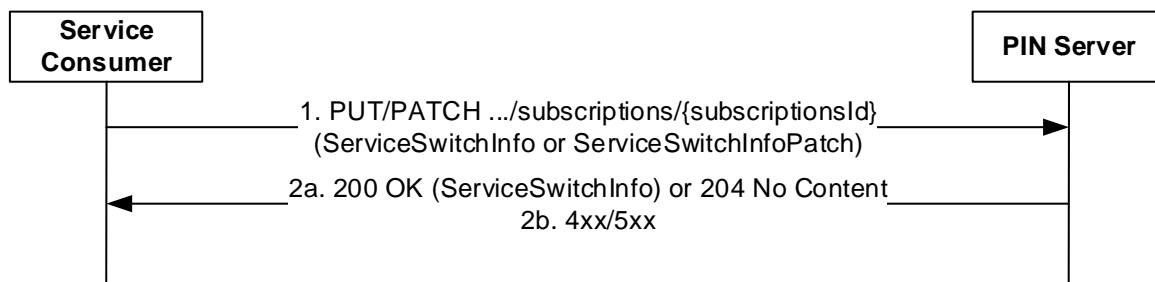


Figure 5.3.2.4.2-1: Procedure for the Service Switch Information Update

1. In order to update an existing service switch information subscription, the service consumer shall send an HTTP PUT/PATCH request to the PIN Server, targeting the URI of the corresponding "Individual Service Switch Information Subscription" resource, with the request body including:
 - the updated representation of the resource within the ServiceSwitchInfo data structure, in case the HTTP PUT method is used; or
 - the requested modifications to the resource within the ServiceSwitchInfoPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the PIN Server shall update the targeted "Individual Service Switch Information Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Service Switch Information Subscription" resource within the ServiceSwitchInfo data structure; or
- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

5.3.2.5 PIN_ASServiceSwitch_Unsubscribe

5.3.2.5.1 General

This service operation is used by the service consumer to remove its subscription at PIN server, for reporting of service switch information.

5.3.2.5.2 Unsubscribing the Service Switch Information

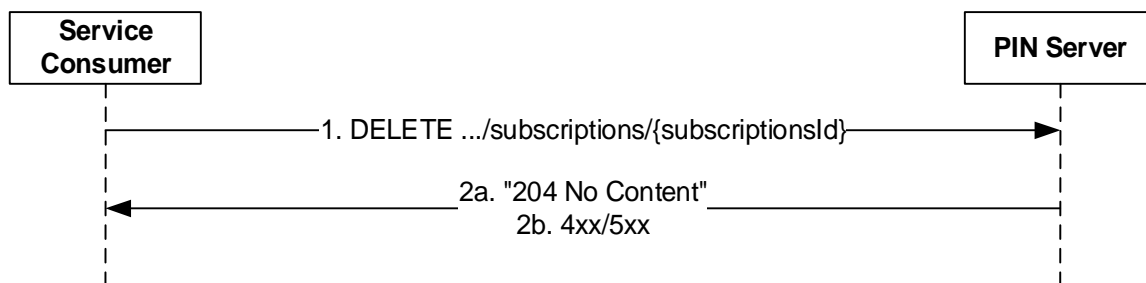


Figure 5.3.2.5.2-1: Procedure for Unsubscribing the Service Switch Information

1. In order to request the deletion of an existing service switch information subscription, the service consumer shall send the HTTP DELETE request message to the PIN Server targeting the "Individual Service Switch Information Subscription" collection resource.
- 2a. Upon success, the PIN Server shall respond with an HTTP "204 No content" status code.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

5.4 PIN_ASServiceContinuity Service

5.4.1 Service Description

The PIN_ASServiceContinuity service exposed by the PIN Server enables a service consumer to:

- create/update/delete a Service Continuity Information Subscription; and
- receive Service Continuity Information Notifications.

5.4.2 Service Operations

5.4.2.1 Introduction

The service operation defined for PIN_ASServiceContinuity API is shown in the table 5.4.2.1-1.

Table 5.4.2.1-1: Operations of the PIN_ASServiceContinuity API

Service operation name	Description	Initiated by
PIN_ASServiceContinuity_Subscribe	This service operation enables a service consumer to create/update/delete a Service Continuity Information Subscription.	e.g., PAS
PIN_ASServiceContinuity_Notify	This service operation enables a service consumer to receive Service Continuity Information Notifications..	PIN server

5.4.2.2 PIN_ASServiceContinuity_Subscribe

5.4.2.2.1 General

This service operation is used by the service consumer to subscribe to PIN server, for reporting of service continuity information.

5.4.2.2.2 Service Continuity Information Subscription Creation

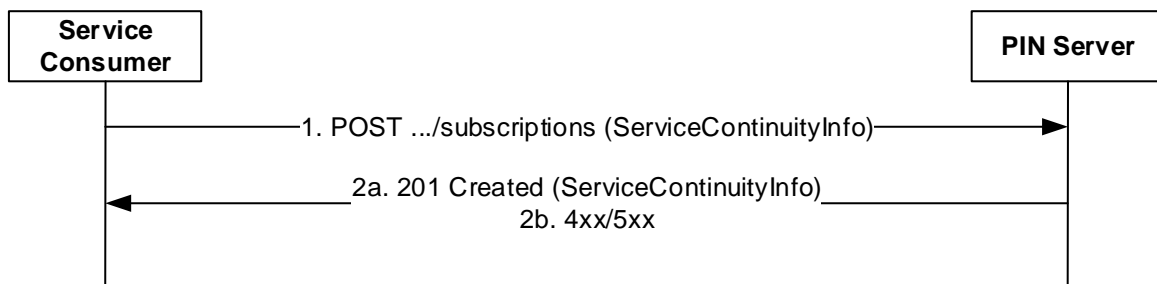


Figure 5.4.2.2.2-1: Procedure for Continuity Information Subscription Creation

1. In order to subscribe to service continuity information, the service consumer shall send the HTTP POST request to the PIN Server targeting the URI of the "Service Continuity Information Subscriptions" collection resource, with the request body including the ServiceContinuityInfo data structure.
- 2a. Upon success, the PIN Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Service Continuity Information Subscription" resource within the ServiceContinuityInfo data structure.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

5.4.2.3 PIN_ASServiceContinuity_Notify

5.4.2.3.1 General

This service operation is used by the PIN server to notify the service consumer about the service continuity information.

5.4.2.3.2 Service Continuity Information Notification

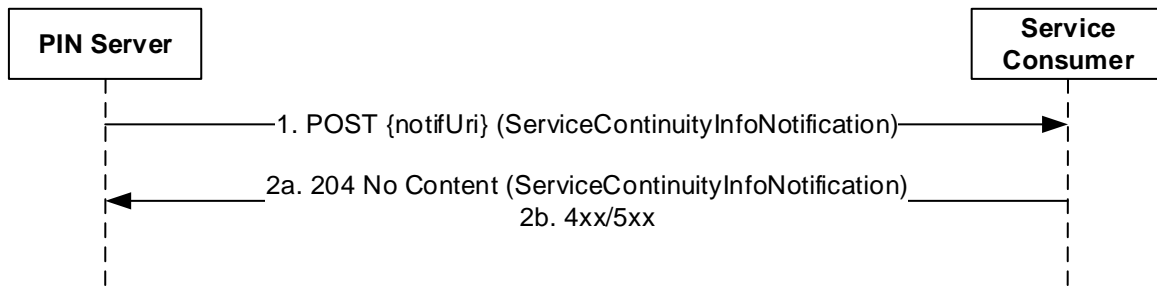


Figure 5.4.2.3.2-1: Procedure for Service Continuity Information Notification

1. In order to notify a previously subscribed service continuity information, the service consumer shall send the HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Service Continuity Information Subscription using the procedures defined in clauses 5.4.2.2 and 5.4.2.4, with the request body including the ServiceContinuityInfoNotification data structure.
- 2a. Upon success, the service consumer shall respond to the PIN server with "204 No Content" code to acknowledge the reception of the notification.
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

5.4.2.4 PIN_ASServiceContinuity_Update

5.4.2.4.1 General

This service operation is used by the service consumer to update a service continuity subscription with the PIN Server.

5.4.2.4.2 Service Continuity Information Update

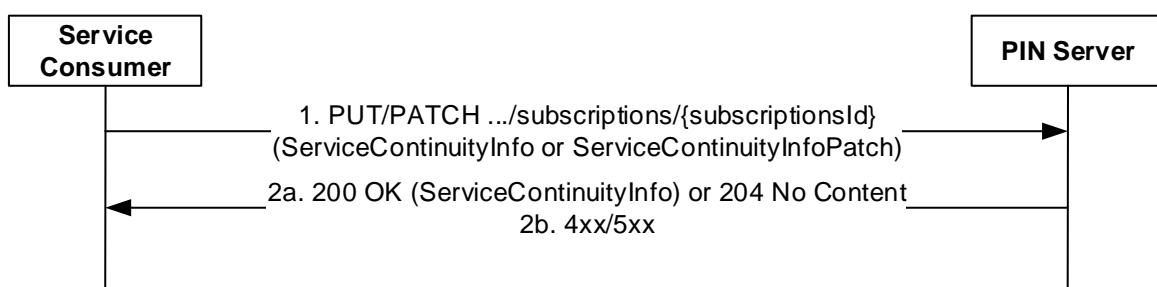


Figure 5.4.2.4.2-1: Procedure for the Service Continuity Information Update

1. In order to update an existing service continuity information subscription, the service consumer shall send an HTTP PUT/PATCH request to the PIN Server, targeting the URI of the corresponding "Individual Service Continuity Information Subscription" resource, with the request body including either:
 - the updated representation of the resource within the ServiceContinuityInfo data structure, in case the HTTP PUT method is used; or
 - the requested modifications to the resource within the ServiceContinuityInfoPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the PIN Server shall updated the targeted "Individual Service Continuity Information Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Service Continuity Information Subscription" resource within the ServiceContinuityInfo data structure; or
- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

5.4.2.5 PIN_ASServiceContinuity_Unsubscribe

5.4.2.5.1 General

This service operation is used by the service consumer to remove its subscription at PIN server, for reporting of service continuity information.

5.4.2.5.2 Unsubscribing the Service Continuity Information

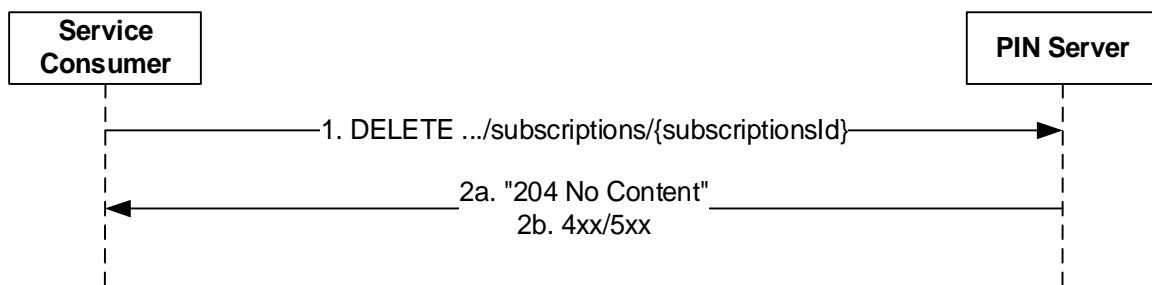


Figure 5.4.2.5.2-1: Procedure for Unsubscribing the Service Continuity Information

1. In order to request the deletion of an existing service continuity information subscription, the service consumer shall send the HTTP DELETE request to the PIN Server targeting the corresponding "Individual Service Continuity Information Subscription" resource.

2a. Upon success, the PIN Server shall respond with an HTTP "204 No content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

6 API Definitions

6.1 PIN_ASRegistration Service API

6.1.1 Introduction

The PIN_ASRegistration service shall use the PIN_ASRegistration service API.

The API URI of the PIN_ASRegistration service API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].
- The <apiName> shall be "pin-as-registration".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the service producer (i.e. PIN Server) takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

6.1.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the PIN_ASRegistration API.

6.1.3 Resources

6.1.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.1.3.1-1 depicts the resource URIs structure for the PIN_ASRegistration API.

{apiRoot}/pin-as-registration/<apiVersion>

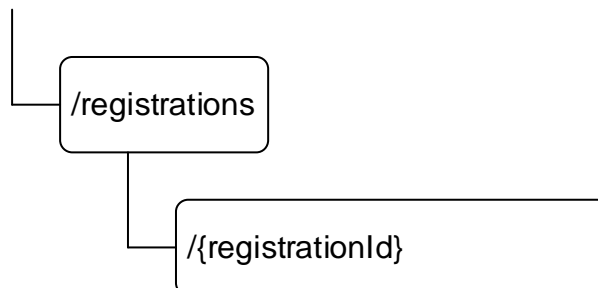


Figure 6.1.3.1-1: Resource URI structure of the PIN_ASRegistration API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
PAS Registrations	/registrations	POST	Request the creation of a new PAS Registration.
Individual PAS Registration	/registrations/{registrationId}	GET	Retrieve an individual PAS registration resource.
		PUT	Request the update of an existing Individual PAS Registration resource.
		PATCH	Request the modification of an existing Individual PAS Registration resource.
		DELETE	Request the deletion of an existing Individual PAS Registration resource.

6.1.3.2 Resource: PAS Registrations

6.1.3.2.1 Description

This resource represents all the PAS that are registered to the PIN server.

6.1.3.2.2 Resource Definition

Resource URI: {apiRoot}/pin-as-registration/<apiVersion>/registrations

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

Name	Data type	Definition
apiRoot	string	See clause 6.1.1.

6.1.3.2.3 Resource Standard Methods

6.1.3.2.3.1 POST

The POST method allows an service consumer to request the creation of a new PAS Registration.

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the POST Request Body on this resource

Name	Data type	P	Cardinality	Description	Applicability
n/a					

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
PASRegistration	M	1	PAS registration request information.

Table 6.1.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
PASRegistration	M	1	201 Created	Successful case. The PAS Registration is successfully created and a representation of the created "Individual PAS Registration " resource is returned. . The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status code for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.				

Table 6.1.3.2.3.1-4: Headers supported by the 201 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains the URI of the newly created resource, according to the structure: {apiRoot}/pin-as-registration/<apiVersion>/registrations/{registrationId}

6.1.3.2.4 Resource Custom Operations

None.

6.1.3.3 Resource: Individual PAS Registration

6.1.3.3.1 Description

This resource represents an "Individual PAS Registration" managed by the PIN server.

6.1.3.3.2 Resource Definition

Resource URI: {apiRoot}/pin-as-registration/<apiVersion>/registrations/{registrationId}

This resource shall support the resource URI variables defined in the table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 6.1.1.
registrationId	string	Represents the identifier of the "Individual PAS Registration" resource.

6.1.3.3.3 Resource Standard Methods

6.1.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual PAS Registration" resource at the PIN server.

This method shall support the URI query parameters specified in table 6.1.3.3.3.1-1.

Table 6.1.3.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.3.3.1-2 and the response data structures and response codes specified in table 6.1.3.3.3.1-3.

Table 6.1.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.1.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
PASRegistration	M	1	200 OK	Successful case. The requested "Individual PAS Registration" resource is returned.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.1.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.1.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.1.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual PAS Registration" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.1.3.3.3.2-1.

Table 6.1.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.3.3.2-2 and the response data structures and response codes specified in table 6.1.3.3.3.2-3.

Table 6.1.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
PASRegistration	M	1	Represents the updated representation of the existing "Individual PAS Registration" resource.

Table 6.1.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
PASRegistration	M	1	200 OK	Successful case. The "Individual PAS Registration" resource is successfully updated and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual PAS Registration" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.1.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.1.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.1.3.3.3.3 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual PAS Registration" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.1.3.3.3.3-1.

Table 6.1.3.3.3.3-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.3.3.3-2 and the response data structures and response codes specified in table 6.1.3.3.3.3-3.

Table 6.1.3.3.3.3-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.1.3.3.3.3-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The targeted "Individual PAS Registration" resource is successfully deleted.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.1.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.1.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.1.3.3.3.4 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual PAS Registration" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.1.3.3.3.4-1.

Table 6.1.3.3.3.4-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.1.3.3.3.4-2 and the response data structures and response codes specified in table 6.1.3.3.3.4-3.

Table 6.1.3.3.3.4-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
PASRegistrationPatch	M	1	Represents the parameters to request the modification of an existing "Individual PAS Registration" resource.

Table 6.1.3.3.3.4-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
PASRegistration	M	1	200 OK	Successful case. The "Individual PAS Registration" resource is successfully modified and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual PAS Registration" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [6].
NOTE: The mandatory HTTP error status code for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.1.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.1.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.1.3.3.4 Resource Custom Operations

None.

6.1.4 Custom Operations without associated resources

None.

6.1.5 Notifications

None.

6.1.6 Data Model

6.1.6.1 General

This clause specifies the application data model supported by the PIN_ASRegistration API.

Table 6.1.6.1-1 specifies the data types defined for the PIN_ASRegistration API.

Table 6.1.6.1-1: PIN_ASRegistration API specific Data Types

Data type	Section defined	Description	Applicability
ConnectivityInfo	6.1.6.2.3	Contains the connectivity information used to communicate with the PAS.	
PASRegistration	6.1.6.2.2	Represents the PAS registration information.	
PASRegistrationPatch	6.1.6.2.4	Represents the requested modifications to the PAS registration information.	

Table 6.1.6.1-2 specifies data types re-used by the PIN_ASRegistration API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the PIN_ASRegistration API.

Table 6.1.6.1-2: PIN_ASRegistration API re-used Data Types

Data type	Reference	Comments	Applicability
DateTime	3GPP TS 29.122 [2]	Used to capture the expiration time of PAS registration.	
DateTimeRm	3GPP TS 29.571 [11]	Used to capture the expiration time of PAS registration patch.	
Fqdn	3GPP TS 29.571 [11]	Used to express the Fully Qualified Domain Name of PAS end point.	
Ipv4Addr	3GPP TS 29.122 [2]	Identifies the IPv4 address of the PAS.	
Ipv6Addr	3GPP TS 29.122 [2]	Identifies the IPv6 address of the PAS.	
SupportedFeatures	3GPP TS 29.571 [11]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	
Uri	3GPP TS 29.122 [2]	Represents a URI.	

6.1.6.2 Structured data types

6.1.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

6.1.6.2.2 Type: PASRegistration

Table 6.1.6.2.2-1: Definition of type PASRegistration

Attribute name	Data type	P	Cardinality	Description	Applicability
conInfo	ConnectivityInfo	M	1	Contains the connectivity information used to communicate with the PAS.	
passId	string	M	1	Identifies the PIN service that provided by the PAS.	
expTime	DateTime	O	0..1	Identifies the expiration time for the PAS registration. To maintain an active registration status, a registration update is required before the expiration time. If the expiration time is not present, then it indicates that the registration of PAS never expires.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 6.1.8. This attribute shall be present only when feature negotiation needs to take place.	

6.1.6.2.3 Type: ConnectivityInfo

Table 6.1.6.2.3-1: Definition of type ConnectivityInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
fqdn	Fqdn	O	0..1	Fully Qualified Domain Name of the PAS.	
ipv4Addr	Ipv4Addr	O	0..1	IPv4 address of the PAS.	
ipv6Addr	Ipv6Addr	O	0..1	IPv6 address of the PAS.	
uri	Uri	O	0..1	URI information of the PAS.	
NOTE: At least one of the attributes shall be provided.					

6.1.6.2.4 Type: PASRegistrationPatch

Table 6.1.6.2.4-1: Definition of type PASRegistrationPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
passId	string	O	0..1	Identifies the PIN service that provided by the PAS.	
conInfo	ConnectivityInfo	O	0..1	Contains the connectivity information used to communicate with the PAS.	
expTime	DateTimeRm	O	0..1	Identifies the expiration time for the PAS registration. If the expiration time is not present, then it indicates that the registration of PAS never expires.	
NOTE: At least one of the attributes shall be provided.					

6.1.6.3 Simple data types and enumerations

6.1.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

Type Name	Type Definition	Description	Applicability
n/a			

6.1.7 Error Handling

6.1.7.1 General

For the PIN_ASRegistration API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the PIN_ASRegistration API.

6.1.7.2 Protocol Errors

No specific procedures for the PIN_ASRegistration API are specified.

6.1.7.3 Application Errors

The application errors defined for the PIN_ASRegistration API are listed in Table 6.1.7.3-1.

Table 6.1.7.3-1: Application errors

Application Error	HTTP status code	Description
n/a		

6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the PIN_ASRegistration API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.1.8-1: Supported Features

Feature number	Feature Name	Description
n/a		

6.1.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the PIN_ASRegistration API.

6.2 PIN_ASServiceSwitch API

6.2.1 Introduction

The PIN_ASServiceSwitch service shall use the PIN_ASServiceSwitch API.

The API URI of the PIN_ASServiceSwitch API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].
- The <apiName> shall be "pin-as-serviceswitch".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the service producer (i.e. PIN Server) takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

6.2.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the PIN_ASServiceSwitch API.

6.2.3 Resources

6.2.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.2.3.1-1 depicts the resource URIs structure for the PIN_ASServiceSwitch API.

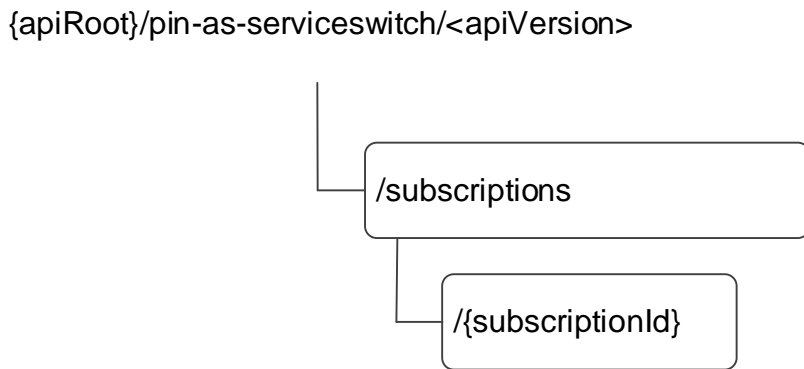


Figure 6.2.3.1-1: Resource URI structure of the PIN_ASServiceSwitch API

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.2.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Service Switch Information Subscriptions	/subscriptions	POST	Request the creation of a Service Switch Information Subscription.
Individual Service Switch Information Subscription	/subscriptions/{subscriptionId}	GET	Retrieve an existing "Individual Service Switch Information Subscription" resource.
		PUT	Request the update of an existing "Individual Service Switch Information Subscription" resource.
		PATCH	Request the modification of an existing "Individual Service Switch Information Subscription" resource.
		DELETE	Request the deletion of an existing "Individual Service Switch Information Subscription" resource.

6.2.3.2 Resource: Service Switch Information Subscriptions

6.2.3.2.1 Description

This resource represents the collection of Service Switch Information Subscriptions managed by the PIN server.

6.2.3.2.2 Resource Definition

Resource URI: **{apiRoot}/pin-as-serviceswitch/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 6.2.1.

6.2.3.2.3 Resource Standard Methods

6.2.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of the Service Switch Information Subscription at the PIN server.

This method shall support the URI query parameters specified in the table 6.2.3.2.3.1-1.

Table 6.2.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.2.3.1-2 and the response data structures and response codes specified in table 6.2.3.2.3.1-3.

Table 6.2.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServiceSwitchInfo	M	1	Represents the parameters to request the creation of a Service Switch Information Subscription.

Table 6.2.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	201 Created	Successful case. The Service Switch Information Subscription is successfully created and a representation of the created "Individual Service Switch Information Subscription" resource shall be returned. The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.				

Table 6.2.3.2.3.1-4: Headers supported by the 201 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains the URI of the newly created resource, according to the structure: {apiRoot}/pin-as-serviceswitch/<apiVersion>/subscriptions/{subscriptionId}

6.2.3.2.4 Resource Custom Operations

None.

6.2.3.3 Resource: Individual Service Switch Information Subscription

6.2.3.3.1 Description

This resource represents the "Individual Service Switch Information Subscription" managed by the PIN server.

6.2.3.3.2 Resource Definition

Resource URI: {apiRoot}/pin-as-serviceswitch/<apiVersion>/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in the table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 6.2.1.
subscriptionId	string	Represents the identifier of the "Individual Service Switch Information Subscription" resource.

6.2.3.3.3 Resource Standard Methods

6.2.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Service Switch Information Subscription" resource at PIN server.

This method shall support the URI query parameters specified in the table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

Table 6.2.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.2.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	200 OK	Successful case. The requested "Individual Service Switch Information Subscription" resource shall be returned.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.2.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.2.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.2.3.3.3.2 PATCH

The HTTP PUT method partially allows a service consumer to request the modification of an existing "Individual Service Switch Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.2.3.3.3.2-1.

Table 6.2.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3.2-2 and the response data structures and response codes specified in table 6.2.3.3.3.2-3.

Table 6.2.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
ServiceSwitchInfoPatch	M	1	Request to parameters to request the modification of the "Individual Service Switch Information Subscription" resource.

Table 6.2.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	200 OK	Successful case. The "Individual Service Switch Information Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual Service Switch Information Subscription" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.2.3.3.3.3 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Service Switch Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.2.3.3.3-1.

Table 6.2.3.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3-2 and the response data structures and response codes specified in table 6.2.3.3.3-3.

Table 6.2.3.3.3-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
ServiceSwitchInfo	M	1	Represents the updated representation of the "Individual Service Switch Information Subscription" resource.

Table 6.2.3.3.3-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	200 OK	Successful case. The "Individual Service Switch Information Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual Service Switch Information Subscription" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.2.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Service Switch Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.2.3.3.3.4-1.

Table 6.2.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.2.3.3.3.4-2 and the response data structures and response codes specified in table 6.2.3.3.3.4-3.

Table 6.2.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.2.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The targeted "Individual Service Switch Information Subscription" resource is successfully deleted.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.				

Table 6.2.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.2.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.2.3.3.4 Resource Custom Operations

None.

6.2.4 Custom Operations without associated resources

None.

6.2.5 Notifications

6.2.5.0 General

Table 6.2.5.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
Service Switch Information Notification	{notificationAddr}	POST	This service operation enables to notify a previously subscribed service consumer on Service Switch Information.

6.2.5.1 Service Switch Information Notification

6.2.5.1.1 Description

The Service Switch Information Notification is used by the PIN server to notify a previously subscribed service consumer on Service Switch Information.

6.2.5.1.2 Target URI

The Callback URI {**notificationAddr**} shall be used with the callback URI variables defined in table 6.2.5.1.2-1.

Table 6.2.5.1.2-1: Callback URI variables

Name	Data type	Definition
notificationAddr	Uri	Represents the callback URI encoded as a string formatted as a URI.

6.2.5.1.3 Standard Methods

6.2.5.1.3.1 POST

This method shall support the request data structures specified in table 6.2.5.1.3.1-1 and the response data structures and response codes specified in table 6.2.5.1.3.1-2.

Table 6.2.5.1.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServiceSwitchInfoNotification	M	1	Represents a Service Switch Information Notification.

Table 6.2.5.1.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The Service Switch Information Notification is successfully received and acknowledged.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].

NOTE: The mandatory HTTP error status code for the POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.

Table 6.2.5.1.3.1-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI representing the end point of an alternative PAS towards which the notification should be redirected.

Table 6.2.5.1.3.1-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI representing the end point of an alternative PAS towards which the notification should be redirected.

6.2.6 Data Model

6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the PIN_ASServiceSwitch API.

Table 6.2.6.1-1: PIN_ASServiceSwitch API specific Data Types

Data type	Section defined	Description	Applicability
EventType	6.2.6.3.2	Represents the event type for service switch information subscription.	
ServiceSwitchInfo	6.2.6.2.2	Represents the service switch information subscription.	
ServiceSwitchInfoPatch	6.2.6.2.3	Used to request the partial update of service switch information subscription.	
ServiceSwitchInfoNotification	6.2.6.2.4	Service switch information for notification	
ServiceSwitchReportInfo	6.2.6.2.5	List of notifications that include the information of the service switch.	

Table 6.2.6.1-2 specifies data types re-used by the PIN_ASServiceSwitch API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the PIN_ASServiceSwitch API.

Table 6.2.6.1-2: PIN_ASServiceSwitch API re-used Data Types

Data type	Reference	Comments	Applicability
DateTime	3GPP TS 29.122 [2]	Used to capture the expiration time of PAS subscription for service switch information reporting.	
FlowInfo	3GPP TS 29.122 [2]	Represents IP flow information.	
SupportedFeatures	3GPP TS 29.571 [11]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	
Uri	3GPP TS 29.122 [2]	Represents a URI.	

6.2.6.2 Structured data types

6.2.6.2.1 Introduction

6.2.6.2.2 Type: ServiceSwitchInfo

Table 6.2.6.2.2-1: Definition of type ServiceSwitchInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
subsEvent	EventType	M	1	Identifies the event type for which the subscriber is to be notified.	
notificationAddr	Uri	M	1	URI where the notification should be delivered to. This attribute shall be present in HTTP POST message to PIN server and maybe present in HTTP PUT request.	
pinId	string	M	1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
expTime	DateTime	O	0..1	Indicates the expiration time of the subscription. To maintain an active registration status, a registration update is required before the expiration time. If the expiration time is not present, then it indicates that the PAS subscription never expires.	
suppFeat	Supported Features	C	0..1	Contains the list of supported features among the ones defined in clause 6.2.8. This attribute shall be present only when feature negotiation needs to take place.	

6.2.6.2.3 Type: ServiceSwitchInfoPatch

Table 6.2.6.2.3-1: Definition of type ServiceSwitchInfoPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
expTime	DateTime	O	0..1	Indicates the proposed expiration time of the subscription.	
notificationAddr	Uri	O	0..1	Updated URI where the service switch information notification should be delivered to.	
pinId	string	O	0..1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
subsEvent	EventType	O	0..1	Updated event type for which the subscriber is to be notified.	

6.2.6.2.4 Type: ServiceSwitchInfoNotification

Table 6.2.6.2.4-1: Definition of type ServiceSwitchInfoNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
subsid	string	M	1	Contains the identifier of the subscription to which Service Switch Information Notification is related.	
replInfo	ServiceSwitchReportInfo	M	1	Contains the report of the service switch information.	

6.2.6.2.5 Type: ServiceSwitchReportInfo

Table 6.2.6.2.5-1: Definition of type ServiceSwitchReportInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
acld	string	M	1	Identifies an application client identifier.	
pinId	string	M	1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
sessionId	string	M	1	Identifies an application session.	
targetPinId	string	M	1	Identifies the target PINE that the service is switched to.	
sessionDes	FlowInfo	O	0..1	Identifies the descriptor of application traffic flows	

6.2.6.3 Simple data types and enumerations

6.2.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

6.2.6.3.2 Enumeration: EventType

The enumeration EventType represents the supported event type of service switch.

Table 6.2.6.3.2-1: Enumeration EventType

Enumeration value	Description	Applicability
SERVICE_SWITCH_INFO	Service switch happens in the PIN	

6.2.7 Error Handling

6.2.7.1 General

For the PIN_ASServiceSwitch API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the PIN_ASServiceSwitch API.

6.2.7.2 Protocol Errors

No specific protocol errors for the PIN_ASServiceSwitch API are specified.

6.2.7.3 Application Errors

The application errors defined for the PIN_ASServiceSwitch API are listed in Table 6.2.7.3-1.

Table 6.2.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

6.2.8 Feature negotiation

The optional features in table 6.2.8-1 are defined for the PIN_ASServiceSwitch API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.2.8-1: Supported Features

Feature number	Feature Name	Description
n/a		

6.2.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the PIN_ASServiceSwitch API.

6.3 PIN_ASServiceContinuity API

6.3.1 Introduction

The PIN_ASServiceContinuity service shall use the PIN_ASServiceContinuity API.

The API URI of the PIN_ASServiceContinuity API shall be:

{apiRoot}/<apiName>/<apiVersion>

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [2], i.e.:

{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>

with the following components:

- The {apiRoot} shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].
- The <apiName> shall be "pin-as-servicecontinuity".
- The <apiVersion> shall be "v1".
- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [2].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the service producer (i.e. PIN Server) takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

6.3.2 Usage of HTTP

The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the PIN_ASServiceContinuity API.

6.3.3 Resources

6.3.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.3.3.1-1 depicts the resource URIs structure for the PIN_ASServiceContinuity API.

{apiRoot}/pin-as-servicecontinuity/<apiVersion>

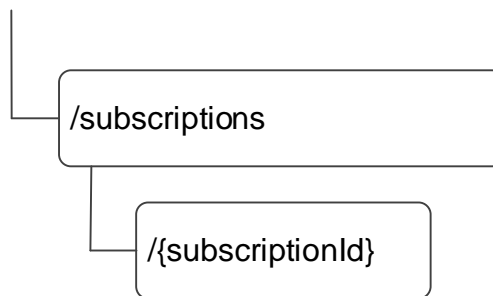


Figure 6.3.3.1-1: Resource URI structure of the PIN_ASServiceContinuity API

Table 6.3.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.3.3.1-1: Resources and methods overview

Resource name	Resource URI	HTTP method or custom operation	Description
Service Continuity Information Subscriptions	/subscriptions	POST	Request the creation of a Service Continuity Information Subscription.
Individual Service Continuity Information Subscription	/subscriptions/{subscriptionId}	GET	Retrieve the Individual service continuity information subscription information identified by subscriptionId.
		PUT	Fully replace the individual service continuity information subscription identified by subscriptionId.
		PATCH	Partially update the individual service continuity information subscription identified by subscriptionId.
		DELETE	Remove the individual service continuity information subscription identified by subscriptionId.

6.3.3.2 Resource: Service Continuity Information Subscriptions

6.3.3.2.1 Description

This resource represents the collection of Service Continuity Information Subscriptions managed by the PIN server.

6.3.3.2.2 Resource Definition

Resource URI: **{apiRoot}/pin-as-servicecontinuity/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.3.3.2.2-1.

Table 6.3.3.2.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 6.3.1.

6.3.3.2.3 Resource Standard Methods

6.3.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Service Continuity Information Subscription at the PIN server.

This method shall support the URI query parameters specified in the table 6.3.3.2.3.1-1.

Table 6.3.3.2.3.1-1: URI query parameters supported by the POST method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.2.3.1-2 and the response data structures and response codes specified in table 6.3.3.2.3.1-3.

Table 6.3.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServiceContinuityInfo	M	1	Represents the parameters to request the creation of a new Service Continuity Information Subscription.

Table 6.3.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceContinuityInfo	M	1	201 Created	Successful case. The Service Continuity Information Subscription is successfully created and a representation of the created "Individual Service Continuity Information Subscription" resource shall be returned. The URI of the created resource shall be returned in the "Location" HTTP header.
NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.3.3.2.3.1-4: Headers supported by the 201 response code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	Contains the URI of the newly created resource, according to the structure: {apiRoot}/pin-as-servicecontinuity/<apiVersion>/subscriptions/{subscriptionId}

6.3.3.2.4 Resource Custom Operations

None.

6.3.3.3 Resource: Individual Service Continuity Information Subscription

6.3.3.3.1 Description

This resource represents an Individual Service Continuity Information Subscription managed by the PIN server.

6.3.3.3.2 Resource Definition

Resource URI: **{apiRoot}/pin-as-servicecontinuity/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in the table 6.3.3.3.2-1.

Table 6.3.3.3.2-1: Resource URI variables for this resource

Name	Data Type	Definition
apiRoot	string	See clause 6.3.1.
subscriptionId	string	Represents the identifier of the "Individual Service Continuity Information Subscription" resource.

6.3.3.3.3 Resource Standard Methods

6.3.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Service Continuity Information Subscription" resource at PIN server.

This method shall support the URI query parameters specified in the table 6.3.3.3.3.1-1.

Table 6.3.3.3.3.1-1: URI query parameters supported by the GET method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.3.3.1-2 and the response data structures and response codes specified in table 6.3.3.3.3.1-3.

Table 6.3.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceContinuityInfo	M	1	200 OK	Successful case. The requested "Individual Service Continuity Information Subscription" resource shall be returned.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.3.3.3.2 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Service Continuity Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.3.3.3.2-1.

Table 6.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.3.2-2 and the response data structures and response codes specified in table 6.3.3.3.2-3.

Table 6.3.3.3.2-2: Data structures supported by the PATCH Request Body on this resource

Data type	P	Cardinality	Description
ServiceContinuityInfoPatch	M	1	Represents the parameters to request the modification of the "Individual Service Continuity Information Subscription" resource.

Table 6.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceContinuityInfo	M	1	200 OK	Successful case. The "Individual Service Continuity Information Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual Service Continuity Information Subscription" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.3.3.3.3 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Service Continuity Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.3.3.3.3-1.

Table 6.3.3.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.3.3-2 and the response data structures and response codes specified in table 6.3.3.3.3-3.

Table 6.3.3.3.3-2: Data structures supported by the PUT Request Body on this resource

Data type	P	Cardinality	Description
ServiceContinuityInfo	M	1	Represents the updated representation of the "Individual Service Continuity Information Subscription" resource.

Table 6.3.3.3.3-3: Data structures supported by the PUT Response Body on this resource

Data type	P	Cardinality	Response codes	Description
ServiceContinuityInfo	M	1	200 OK	Successful case. The "Individual Service Continuity Information Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body.
n/a			204 No Content	Successful case. The "Individual Service Continuity Information Subscription" resource is successfully updated and no content is returned in the response body.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Service Continuity Information Subscription" resource at the PIN server.

This method shall support the URI query parameters specified in the table 6.3.3.3.4-1.

Table 6.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

Name	Data type	P	Cardinality	Description
n/a				

This method shall support the request data structures specified in table 6.3.3.3.4-2 and the response data structures and response codes specified in table 6.3.3.3.4-3.

Table 6.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

Data type	P	Cardinality	Description
n/a			

Table 6.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The targeted "Individual Service Continuity Information Subscription" resource is successfully deleted.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PIN server. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.				

Table 6.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

Table 6.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI of the resource located in an alternative PIN server.

6.3.3.3.4 Resource Custom Operations

None.

6.3.4 Custom Operations without associated resources

None.

6.3.5 Notifications

6.3.5.0 General

Table 6.3.5.1-1: Notifications overview

Notification	Callback URI	HTTP method or custom operation	Description (service operation)
Service Continuity Information Notification	{notificationAddr}	POST	This service operation enables to notify a previously subscribed service consumer on service continuity information.

6.3.5.1 Service Continuity Information Notification

6.3.5.1.1 Description

The Service Continuity Information Notification is used by the PIN server to notify a previously subscribed service consumer on service continuity information.

6.3.5.1.2 Target URI

The callback URI **{notificationAddr}** shall be used with the callback URI variables defined in table 6.3.5.1.2-1.

Table 6.3.5.1.2-1: Callback URI variables

Name	Data type	Definition
notificationAddr	Uri	Represents the callback URI encoded as a string formatted as a URI.

6.3.5.1.3 Standard Methods

6.3.5.1.3.1 POST

This method shall support the request data structures specified in table 6.3.5.1.3.1-1 and the response data structures and response codes specified in table 6.3.5.1.3.1-2.

Table 6.3.5.1.3.1-1: Data structures supported by the POST Request Body on this resource

Data type	P	Cardinality	Description
ServiceContinuityInfoNotification	M	1	Represents a Service Continuity Information Notification.

Table 6.3.5.1.3.1-2: Data structures supported by the POST Response Body on this resource

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	Successful case. The Service Continuity Information Notification is successfully received and acknowledged.
n/a			307 Temporary Redirect	Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].
n/a			308 Permanent Redirect	Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative EAS where the notification should be sent. Redirection handling is described in clause 5.2.10 of TS 29.122 [2].

NOTE: The mandatory HTTP error status codeS for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.

Table 6.3.5.1.3.1-3: Headers supported by the 307 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI representing the end point of an alternative PAS towards which the notification should be redirected.

Table 6.3.5.1.3.1-4: Headers supported by the 308 Response Code on this resource

Name	Data type	P	Cardinality	Description
Location	string	M	1	An alternative URI representing the end point of an alternative PAS towards which the notification should be redirected.

6.3.6 Data Model

6.3.6.1 General

This clause specifies the application data model supported by the API.

Table 6.3.6.1-1 specifies the data types defined for the PIN_ASServiceContinuity API.

Table 6.3.6.1-1: PIN_ASServiceContinuity API specific Data Types

Data type	Section defined	Description	Applicability
EventType	6.3.6.3.2	Represents the event type for service continuity information subscription.	
ServiceContinuityInfo	6.3.6.2.2	Represents the service continuity information subscription.	
ServiceContinuityInfoPatch	6.3.6.2.3	Used to request the partial update of service continuity information subscription.	
ServiceContinuityInfoNotification	6.3.6.2.4	Service continuity information for notification	
ServiceContinuityReportInfo	6.3.6.2.5	List of notifications that include the information of the service continuity.	

Table 6.3.6.1-2 specifies data types re-used by the PIN_ASServiceContinuity API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the PIN_ASServiceContinuity API.

Table 6.3.6.1-2: PIN_ASServiceContinuity API re-used Data Types

Data type	Reference	Comments	Applicability
DateTime	3GPP TS 29.122 [2]	Used to capture the expiration time of PAS subscription for service continuity information reporting.	
FlowInfo	3GPP TS 29.122 [2]	Represents IP flow information.	
SupportedFeatures	3GPP TS 29.571 [11]	Represents the list of supported feature(s) and used to negotiate the applicability of the optional features.	
Uri	3GPP TS 29.122 [2]	Represents a URI.	

6.3.6.2 Structured data types

6.3.6.2.1 Introduction

6.3.6.2.2 Type: ServiceContinuityInfo

Table 6.3.6.2.2-1: Definition of type ServiceContinuityInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
subsEvent	EventType	M	1	Identifies the event type for which the subscriber is to be notified.	
notificationAddr	Uri	M	1	URI where the notification should be delivered to. This attribute shall be present in HTTP POST to PIN server and maybe present in HTTP PUT request.	
pinId	string	M	1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
expTime	DateTime	O	0..1	Indicates the expiration time of the subscription. To maintain an active registration status, a registration update is required before the expiration time. If the expiration time is not present, then it indicates that the PAS subscription never expires.	
suppFeat	SupportedFeatures	C	0..1	Contains the list of supported features among the ones defined in clause 6.3.8. This attribute shall be present only when feature negotiation needs to take place.	

6.3.6.2.3 Type: ServiceContinuityInfoPatch

Table 6.3.6.2.3-1: Definition of type ServiceContinuityInfoPatch

Attribute name	Data type	P	Cardinality	Description	Applicability
expTime	DateTime	O	0..1	Indicates the proposed expiration time of the subscription.	
notificationAddr	Uri	O	0..1	Updated URI where the service continuity information notification should be delivered to.	
pinId	string	O	0..1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
subsEvent	EventType	O	0..1	Updated event type for which the subscriber is to be notified.	

6.3.6.2.4 Type: ServiceContinuityInfoNotification

Table 6.3.6.2.4-1: Definition of type ServiceContinuityInfoNotification

Attribute name	Data type	P	Cardinality	Description	Applicability
subslid	string	M	1	Identifies the individual service continuity information subscription for which the service continuity information notification is delivered.	
replInfo	ServiceContinuityReportInfo	M	1	List of service continuity report information applicable to the subscription identifier.	

6.3.6.2.5 Type: ServiceContinuityReportInfo

Table 6.3.6.2.5-1: Definition of type ServiceContinuityReportInfo

Attribute name	Data type	P	Cardinality	Description	Applicability
acld	string	M	1	Identifies an application client identifier.	
pegcld	string	M	1	Identifies a PEGC.	
pinId	string	M	1	Identifies a PIN. (see 3GPP TS 23.542 [10]). Its encoding shall comply with the UE policy part type URSP as defined in clause 5.2 of 3GPP TS 24.526 [12].	
serviceld	string	M	1	Identifies a PIN service.	
sessionId	string	M	1	Identifies an application session.	
targetPineld	string	M	1	Identifies the target PINE.	
sessionDes	FlowInfo	O	0..1	Identifies the descriptor of application traffic flows	

6.3.6.3 Simple data types and enumerations

6.3.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

6.3.6.3.2 Enumeration: EventType

The enumeration EventType represents the supported event type of service continuity.

Table 6.3.6.3.2-1: Enumeration EventType

Enumeration value	Description	Applicability
SERVICE_CONTINUITY_INFO	Service continuity happens in the PIN	

6.3.7 Error Handling

6.3.7.1 General

For the PIN_ASServiceContinuity API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [2]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [2] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [2].

In addition, the requirements in the following clauses are applicable for the PIN_ASServiceContinuity API.

6.3.7.2 Protocol Errors

No specific protocol errors for the PIN_ASServiceContinuity API are specified.

6.3.7.3 Application Errors

The application errors defined for the PIN_ASServiceContinuity API are listed in Table 6.3.7.3-1.

Table 6.3.7.3-1: Application errors

Application Error	HTTP status code	Description	Applicability

6.3.8 Feature negotiation

The optional features in table 6.3.8-1 are defined for the PIN_ASServiceContinuity API. They shall be negotiated using the extensibility mechanism defined in clause 5.2.7 of 3GPP TS 29.122 [2].

Table 6.3.8-1: Supported Features

Feature number	Feature Name	Description
n/a		

6.3.9 Security

The provisions of clause 6 of 3GPP TS 29.122 [2] shall apply for the PIN_ASServiceContinuity API.

7 Using Common API Framework

7.1 General

When CAPIF is used with a PIN Server service, the PIN Server shall support the following functionalities as defined in 3GPP TS 29.222 [7]:

- the API exposing function and the related APIs over CAPIF-2/2e and CAPIF-3/3e reference points;
- the API publishing function and the related APIs over CAPIF-4/4e reference point;
- the API management function and the related APIs over CAPIF-5/5e reference point; and
- at least one of the security methods for authentication and authorization, and the related security mechanisms.

In a centralized deployment as defined in 3GPP TS 23.222 [6], where the CAPIF core function and the API provider domain functions are co-located, the interactions between the CAPIF core function and the API provider domain functions may be independent of the CAPIF-3/3e, CAPIF-4/4e and CAPIF-5/5e reference points.

When CAPIF is used with a PIN Server service, the PIN Server shall register all the northbound APIs features in the CAPIF Core Function.

7.2 Security

When CAPIF is used for external exposure, before invoking an API exposed by the PIN Server, the service API consumer acting as an API invoker shall negotiate the security method (PKI, TLS-PSK or OAuth 2.0) with the CAPIF core function and ensure that the PIN Server has enough credentials to authenticate the service API consumer, as defined in clauses 5.6.2.2 and 6.2.2.2 of 3GPP TS 29.222 [7].

If PKI or TLS-PSK is selected as the security method to be used between the service API consumer and the PIN Server, upon API invocation, the PIN Server shall retrieve the authorization information from the CAPIF core function as described in clause 5.6.2.4 of 3GPP TS 29.222 [7].

As indicated in 3GPP TS 33.122 [8], the access to the PIN Server APIs may be authorized by means of the OAuth 2.0 protocol (see IETF RFC 6749 [9]), using the "Client Credentials" authorization grant, where the CAPIF core function (see 3GPP TS 29.222 [7]) plays the role of the authorization server.

NOTE 1: In this release, only "Client Credentials" authorization grant is supported.

If OAuth 2.0 is selected as the security method to be used between the service API consumer and the PIN Server, the service API consumer shall, prior to consuming the services offered by the PIN Server APIs, obtain a "token" from the authorization server, by invoking the Obtain_Authorization service operation as described in clause 5.6.2.3.2 of 3GPP TS 29.222 [7].

The PIN Server APIs do not define any scopes for OAuth 2.0 authorization. It is the PIN Server responsibility to check whether the service API consumer is authorized to use an API based on the provided "token". Once the PIN Server verifies the "token", it shall check whether the PIN Server identifier in the "token" matches its own published identifier, and whether the API name in the "token" matches its own published API name. If those checks are passed, the service API consumer has full authority to access any resource or operation provided by the invoked API.

NOTE 2: For the aforementioned security methods, the PIN Server needs to apply admission control according to access control policies after performing the authorization checks.

Annex A (normative): OpenAPI specification

A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5.3.1 of 3GPP TS 29.501 [5] and clause 5B of 3GPP TR 21.900 [7]).

A.2 PIN_ASRegistration API

openapi: 3.0.0

info:

```
title: PIN Server PAS Registration Service
version: 1.0.0
description: |
  PIN Server PAS Registration Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.583 V18.1.0; Application layer support for Personal IoT Network (PINAPP);
  Personal IoT Network (PIN) Server Services; Stage 3.
url: http://www.3gpp.org/ftp/Specs/archive/29_series/29.583/
```

servers:

```
- url: '{apiRoot}/pin-as-registration/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 6.1 of 3GPP TS 29.583.
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

paths:

```
/registrations:
  post:
    summary: Create a new PAS Registration
    operationId: CreatePASRegistration
    tags:
      - PAS Registrations (Collection)
    description: Register a new PAS at the PIN Server.
    requestBody:
      required: true
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/PASRegistration'
    responses:
      '201':
        description: PAS information is registered successfully at PIN server.
        content:
          application/json:
```

```

    schema:
      $ref: '#/components/schemas/PASRegistration'
  headers:
    Location:
      description: 'Contains the URI of the newly created resource'
      required: true
      schema:
        type: string
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '411':
    $ref: 'TS29122_CommonData.yaml#/components/responses/411'
  '413':
    $ref: 'TS29122_CommonData.yaml#/components/responses/413'
  '415':
    $ref: 'TS29122_CommonData.yaml#/components/responses/415'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

/registrations/{registrationId}:
  parameters:
    - name: registrationId
      in: path
      description: Registration Id.
      required: true
      schema:
        type: string

  get:
    summary: Get an Individual PAS Registration
    operationId: GetIndPASReg
    tags:
      - Individual PAS Registration (Document)
    description: Retrieve an Individual PAS registration resource.
    responses:
      '200':
        description: OK (The PAS registration information at the PIN Server).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/PASRegistration'
      '307':
        $ref: 'TS29122_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29122_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '406':
        $ref: 'TS29122_CommonData.yaml#/components/responses/406'
      '429':
        $ref: 'TS29122_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29122_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29122_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  put:
    summary: Fully update an Individual PAS Registration

```



```

operationId: UpdateIndPASReg
tags:
  - Individual PAS Registration (Document)
requestBody:
  required: true
  content:
    application/json:
      schema:
        $ref: '#/components/schemas/PASRegistration'
responses:
  '200':
    description: OK (The PAS registration information is updated successfully).
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/PASRegistration'
  '204':
    description: No Content. The PAS registration information is updated successfully.
  '307':
    $ref: 'TS29122_CommonData.yaml#/components/responses/307'
  '308':
    $ref: 'TS29122_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '411':
    $ref: 'TS29122_CommonData.yaml#/components/responses/411'
  '413':
    $ref: 'TS29122_CommonData.yaml#/components/responses/413'
  '415':
    $ref: 'TS29122_CommonData.yaml#/components/responses/415'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

patch:
summary: Modify an Individual PAS Registration
operationId: ModifyIndPASReg
tags:
  - Individual PAS Registration (Document)
requestBody:
  description: Partial update an existing PAS registration resource.
  required: true
  content:
    application/merge-patch+json:
      schema:
        $ref: '#/components/schemas/PASRegistrationPatch'
responses:
  '200':
    description: >
      The Individual PAS registration is successfully modified and
      the updated registration information is returned in the response.
    content:
      application/json:
        schema:
          $ref: '#/components/schemas/PASRegistration'
  '204':
    description: No Content. The Individual PAS registration is successfully modified.
  '307':
    $ref: 'TS29122_CommonData.yaml#/components/responses/307'
  '308':
    $ref: 'TS29122_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'

```

```

'404':
  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
'411':
  $ref: 'TS29122_CommonData.yaml#/components/responses/411'
'413':
  $ref: 'TS29122_CommonData.yaml#/components/responses/413'
'415':
  $ref: 'TS29122_CommonData.yaml#/components/responses/415'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

delete:

summary: Delete an Individual PAS Registration
 operationId: DeleteIndPASReg

tags:

- Individual PAS Registration (Document)

responses:

```

'204':
  description: The individual PAS registration is deleted.
'307':
  $ref: 'TS29122_CommonData.yaml#/components/responses/307'
'308':
  $ref: 'TS29122_CommonData.yaml#/components/responses/308'
'400':
  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
'401':
  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
'403':
  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
'404':
  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

components:

```

securitySchemes:
  oAuth2ClientCredentials:
    type: oauth2
    flows:
      clientCredentials:
        tokenUrl: '{tokenUrl}'
        scopes: {}

```

schemas:

```

#
# STRUCTURED DATA TYPES
#

```

PASRegistration:

```

type: object
description: Represents an PAS registration information.
properties:
  conInfo:
    $ref: '#/components/schemas/ConnectivityInfo'
  expTime:
    $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
  passId:
    type: string
    description: Identifies a PIN service
  suppFeat:
    $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
required:
  - conInfo
  - passId

```

```
ConnectivityInfo:
  type: object
  description: Represents a connection information of PAS.
  properties:
    fqdn:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/Fqdn'
    ipv4Addr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv4Addr'
    ipv6Addr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Ipv6Addr'
    uri:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
  anyOf:
    - required: [uri]
    - required: [fqdn]
    - required: [ipv4Addr]
    - required: [ipv6Addr]

PASRegistrationPatch:
  type: object
  description: Represents partial update request of individual PAS registration information.
  properties:
    conInfo:
      $ref: '#/components/schemas/ConnectivityInfo'
    expTime:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/DateTimeRm'
    passId:
      type: string
      description: Identifies a PIN service provided by PAS.
  anyOf:
    - required: [conInfo]
    - required: [expTime]
    - required: [passId]
```

A.3 PIN_ASServiceSwitch API

openapi: 3.0.0

info:

```
title: PIN Server Service Switch Information Service
version: 1.0.0
description: |
  PIN Server Service Switch Information Service.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.583 V18.1.0; Application layer support for Personal IoT Network (PINAPP);
  Personal IoT Network (PIN) Server Services; Stage 3.
url: http://www.3gpp.org/ftp/Specs/archive/29_series/29.583/
```

servers:

```
- url: '{apiRoot}/pin-as-serviceswitch/v1'
  variables:
    apiRoot:
      default: https://example.com
      description: apiRoot as defined in clause 6.2 of 3GPP TS 29.583.
```

security:

```
- {}
- oAuth2ClientCredentials: []
```

paths:

```
/subscriptions:
  post:
    summary: Creates a new Individual Service Switch Information Subscriptions resource
    operationId: CreateServiceSwitchInfo
    tags:
      - Service Switch Information Subscriptions (Collection)
    description: Create a Subscription for reporting service switch information to PAS.
    requestBody:
      required: true
    content:
      application/json:
```

```

    schema:
      $ref: '#/components/schemas/ServiceSwitchInfo'
  responses:
    '201':
      description: >
        Created. The Individual Service Switch Information Subscription resource is created
        successfully
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServiceSwitchInfo'
      headers:
        Location:
          description: >
            Contains the URI of the created Individual Service Switch Information
            Subscription resource.
          required: true
          schema:
            type: string
    '400':
      $ref: 'TS29122_CommonData.yaml#/components/responses/400'
    '401':
      $ref: 'TS29122_CommonData.yaml#/components/responses/401'
    '403':
      $ref: 'TS29122_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29122_CommonData.yaml#/components/responses/404'
    '411':
      $ref: 'TS29122_CommonData.yaml#/components/responses/411'
    '413':
      $ref: 'TS29122_CommonData.yaml#/components/responses/413'
    '415':
      $ref: 'TS29122_CommonData.yaml#/components/responses/415'
    '429':
      $ref: 'TS29122_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'
  callbacks:
    ServiceSwitchInfoNotification:
      '{$request.body#/notificationAddr}':
        post:
          requestBody:
            required: true
            content:
              application/json:
                schema:
                  $ref: '#/components/schemas/ServiceSwitchInfoNotification'
          responses:
            '204':
              description: No Content (successful notification)
            '307':
              $ref: 'TS29122_CommonData.yaml#/components/responses/307'
            '308':
              $ref: 'TS29122_CommonData.yaml#/components/responses/308'
            '400':
              $ref: 'TS29122_CommonData.yaml#/components/responses/400'
            '401':
              $ref: 'TS29122_CommonData.yaml#/components/responses/401'
            '403':
              $ref: 'TS29122_CommonData.yaml#/components/responses/403'
            '404':
              $ref: 'TS29122_CommonData.yaml#/components/responses/404'
            '411':
              $ref: 'TS29122_CommonData.yaml#/components/responses/411'
            '413':
              $ref: 'TS29122_CommonData.yaml#/components/responses/413'
            '415':
              $ref: 'TS29122_CommonData.yaml#/components/responses/415'
            '429':
              $ref: 'TS29122_CommonData.yaml#/components/responses/429'
            '500':
              $ref: 'TS29122_CommonData.yaml#/components/responses/500'
            '503':
              $ref: 'TS29122_CommonData.yaml#/components/responses/503'

```

```

        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string

  get:
    summary: Read an Individual Service Switch Information Subscriptions resource
    operationId: ReadIndServiceSwitchInfo
    tags:
      - Individual Service Switch Information Subscription (Document)
    responses:
      '200':
        description: OK (Successfully get the Service Switch information subscription).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServiceSwitchInfo'
      '307':
        $ref: 'TS29122_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29122_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '406':
        $ref: 'TS29122_CommonData.yaml#/components/responses/406'
      '429':
        $ref: 'TS29122_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29122_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29122_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  put:
    summary: Request the fullyupdate an Individual Service Switch Information Subscriptions
    resource.
    operationId: UpdateIndServiceSwitchInfo
    tags:
      - Individual Service Switch Information Subscription (Document)
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServiceSwitchInfo'
    responses:
      '200':
        description: OK (Successfully modified The individual Service Switch information).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServiceSwitchInfo'
      '204':
        description: No Content.
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '411':
        $ref: 'TS29122_CommonData.yaml#/components/responses/411'

```

```

'413':
  $ref: 'TS29122_CommonData.yaml#/components/responses/413'
'415':
  $ref: 'TS29122_CommonData.yaml#/components/responses/415'
'429':
  $ref: 'TS29122_CommonData.yaml#/components/responses/429'
'500':
  $ref: 'TS29122_CommonData.yaml#/components/responses/500'
'503':
  $ref: 'TS29122_CommonData.yaml#/components/responses/503'
default:
  $ref: 'TS29122_CommonData.yaml#/components/responses/default'

patch:
  summary: Modify an Individual Service Switch Information Subscriptions resource
  operationId: ModifyIndServiceSwitchInfo
  tags:
    - Individual Service Switch Information Subscription (Document)
  requestBody:
    description: Partial update an existing Individual ServiceSwitch information.
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/ServiceSwitchInfoPatch'
  responses:
    '200':
      description: >
        OK (The Individual ServiceSwitch information Subscription is successfully modified
        and the updated subscription information is returned in the response).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServiceSwitchInfo'
    '204':
      description: >
        No Content (The individual Service Switch information subscription was modified
        successfully).
    '307':
      $ref: 'TS29122_CommonData.yaml#/components/responses/307'
    '308':
      $ref: 'TS29122_CommonData.yaml#/components/responses/308'
    '400':
      $ref: 'TS29122_CommonData.yaml#/components/responses/400'
    '401':
      $ref: 'TS29122_CommonData.yaml#/components/responses/401'
    '403':
      $ref: 'TS29122_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29122_CommonData.yaml#/components/responses/404'
    '411':
      $ref: 'TS29122_CommonData.yaml#/components/responses/411'
    '413':
      $ref: 'TS29122_CommonData.yaml#/components/responses/413'
    '415':
      $ref: 'TS29122_CommonData.yaml#/components/responses/415'
    '429':
      $ref: 'TS29122_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29122_CommonData.yaml#/components/responses/default'

delete:
  summary: Delete an Individual Service Switch Information Subscriptions resource.
  operationId: DeleteIndServiceSwitchInfo
  tags:
    - Individual Service Switch Information Subscription (Document)
  responses:
    '204':
      description: The individual subscription is deleted.
    '307':
      $ref: 'TS29122_CommonData.yaml#/components/responses/307'
    '308':
      $ref: 'TS29122_CommonData.yaml#/components/responses/308'
    '400':

```

```

    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

```

Components

```

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

```

schemas:

```

#
# STRUCTURED DATA TYPES
#

```

```

ServiceSwitchInfo:
  type: object
  description: Represents an Individual Service Switch Information Subscription.
  properties:
    subsEvent:
      $ref: '#/components/schemas/EventType'
    notificationAddr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    pinId:
      type: string
      description: Identifies a PIN.
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
    suppFeat:
      $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
  required:
    - subsEvent
    - notificationAddr
    - pinId

```

```

ServiceSwitchInfoPatch:
  type: object
  description: Represents the partial update of Individual Service Switch Information.
  properties:
    subsEvent:
      $ref: '#/components/schemas/EventType'
    notificationAddr:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
    pinId:
      type: string
      description: Identifies a PIN.
    expTime:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'

```

```

ServiceSwitchInfoNotification:
  type: object
  description: Represent the service switch information for notification.
  properties:
    subsId:
      type: string
      description: >
        Identifies the individual service switch information subscription for which
        the service switch information notification is delivered.
    repInfo:
      $ref: '#/components/schemas/ServiceSwitchReportInfo'

```

```

required:
  - subsId
  - repInfo

ServiceSwitchReportInfo:
  type: object
  description: List of notifications that include the information of the service switch.
  properties:
    acId:
      type: string
      description: Identifies an application client identifier.
    pinId:
      type: string
      description: Identifies a PIN.
    sessionId:
      type: string
      description: Identifies an application session.
    targetPineId:
      type: string
      description: Identifies the PINE that the service is switched to.
    sessionDes:
      $ref: 'TS29122_CommonData.yaml#/components/schemas/FlowInfo'
  required:
    - acId
    - pinId
    - sessionId
    - targetPineId

```

```

#
# ENUMERATIONS
#

```

```

EventType:
  anyOf:
    - type: string
      enum:
        - SERVICE_SWITCH_INFO
    - type: string
      description: >
        This string provides forward-compatibility with future extensions to the enumeration
        and is not used to encode content defined in the present version of this API.
  description: |
    Indicates service switch type.
    Possible values are:
    - SERVICE_SWITCH_INFO: Indicates service switch type(s).

```

A.4 PIN_ASServiceContinuity API

openapi: 3.0.0

```

info:
  title: PIN Server Service Continuity Service
  version: 1.0.0
  description: |
    PIN Server Service Continuity Information Service.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.

externalDocs:
  description: >
    3GPP TS 29.583 V18.1.0; Application layer support for Personal IoT Network (PINAPP);
    Personal IoT Network (PIN) Server Services; Stage 3.
  url: http://www.3gpp.org/ftp/Specs/archive/29_series/29.583

servers:
  - url: '{apiRoot}/pin-as-servicecontinuity/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 6.3.1 of 3GPP TS 29.583.

security:
  - {}
  - oAuth2ClientCredentials: []

```



```

paths:
  /subscriptions:
    post:
      summary: Creates a new Individual Service Continuity Information Subscriptions resource
      operationId: CreateServiceContinuityInfo
      tags:
        - Service Continuity Information Subscriptions (Collection)
      description: Create a Subscription for reporting service continuity information to PAS.
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServiceContinuityInfo'
      responses:
        '201':
          description: >
            Created. The individual Service Continuity information subscription resource is
            created successfully.
          content:
            application/json:
              schema:
                $ref: '#/components/schemas/ServiceContinuityInfo'
          headers:
            Location:
              description: 'Contains the URI of the newly created resource'
              required: true
              schema:
                type: string
        '400':
          $ref: 'TS29122_CommonData.yaml#/components/responses/400'
        '401':
          $ref: 'TS29122_CommonData.yaml#/components/responses/401'
        '403':
          $ref: 'TS29122_CommonData.yaml#/components/responses/403'
        '404':
          $ref: 'TS29122_CommonData.yaml#/components/responses/404'
        '411':
          $ref: 'TS29122_CommonData.yaml#/components/responses/411'
        '413':
          $ref: 'TS29122_CommonData.yaml#/components/responses/413'
        '415':
          $ref: 'TS29122_CommonData.yaml#/components/responses/415'
        '429':
          $ref: 'TS29122_CommonData.yaml#/components/responses/429'
        '500':
          $ref: 'TS29122_CommonData.yaml#/components/responses/500'
        '503':
          $ref: 'TS29122_CommonData.yaml#/components/responses/503'
        default:
          $ref: 'TS29122_CommonData.yaml#/components/responses/default'
      callbacks:
        ServiceContinuityInfoNotification:
          '{$request.body#/notificationAddr}':
            post:
              requestBody:
                required: true
                content:
                  application/json:
                    schema:
                      $ref: '#/components/schemas/ServiceContinuityInfoNotification'
              responses:
                '204':
                  description: No Content (successful notification)
                '307':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/307'
                '308':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/308'
                '400':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/400'
                '401':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/401'
                '403':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/403'
                '404':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/404'
                '411':
                  $ref: 'TS29122_CommonData.yaml#/components/responses/411'

```

```

    '413':
      $ref: 'TS29122_CommonData.yaml#/components/responses/413'
    '415':
      $ref: 'TS29122_CommonData.yaml#/components/responses/415'
    '429':
      $ref: 'TS29122_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string

  get:
    summary: Read an Individual Service Continuity Information Subscriptions resource
    operationId: ReadIndServiceContinuityInfo
    tags:
      - Individual Service Continuity Information Subscription (Document)
    responses:
      '200':
        description: OK (Successfully get the Service Continuity information subscription).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServiceContinuityInfo'
      '307':
        $ref: 'TS29122_CommonData.yaml#/components/responses/307'
      '308':
        $ref: 'TS29122_CommonData.yaml#/components/responses/308'
      '400':
        $ref: 'TS29122_CommonData.yaml#/components/responses/400'
      '401':
        $ref: 'TS29122_CommonData.yaml#/components/responses/401'
      '403':
        $ref: 'TS29122_CommonData.yaml#/components/responses/403'
      '404':
        $ref: 'TS29122_CommonData.yaml#/components/responses/404'
      '406':
        $ref: 'TS29122_CommonData.yaml#/components/responses/406'
      '429':
        $ref: 'TS29122_CommonData.yaml#/components/responses/429'
      '500':
        $ref: 'TS29122_CommonData.yaml#/components/responses/500'
      '503':
        $ref: 'TS29122_CommonData.yaml#/components/responses/503'
      default:
        $ref: 'TS29122_CommonData.yaml#/components/responses/default'

  put:
    summary: Update an Individual Service Continuity Information Subscriptions resource
    operationId: UpdateIndServiceContinuityInfo
    tags:
      - Individual Service Continuity Information Subscription (Document)
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServiceContinuityInfo'
    responses:
      '200':
        description: OK (Successfully modified The individual Service Continuity information).
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/ServiceContinuityInfo'
      '204':
        description: No Content.
      '400':

```

```

    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '411':
    $ref: 'TS29122_CommonData.yaml#/components/responses/411'
  '413':
    $ref: 'TS29122_CommonData.yaml#/components/responses/413'
  '415':
    $ref: 'TS29122_CommonData.yaml#/components/responses/415'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

patch:
  summary: Modify an Individual Service Continuity Information Subscriptions resource
  operationId: ModifyIndServiceContinuityInfo
  tags:
    - Individual Service Continuity Information Subscription (Document)
  requestBody:
    description: Partial update an existing Individual ServiceContinuity information.
    required: true
    content:
      application/merge-patch+json:
        schema:
          $ref: '#/components/schemas/ServiceContinuityInfoPatch'
  responses:
    '200':
      description: >
        OK (The Individual ServiceContinuity information Subscription is successfully modified
        and the updated subscription information is returned in the response).
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/ServiceContinuityInfo'
    '204':
      description: >
        No Content (The individual Service Continuity information subscription was modified
        successfully).
    '307':
      $ref: 'TS29122_CommonData.yaml#/components/responses/307'
    '308':
      $ref: 'TS29122_CommonData.yaml#/components/responses/308'
    '400':
      $ref: 'TS29122_CommonData.yaml#/components/responses/400'
    '401':
      $ref: 'TS29122_CommonData.yaml#/components/responses/401'
    '403':
      $ref: 'TS29122_CommonData.yaml#/components/responses/403'
    '404':
      $ref: 'TS29122_CommonData.yaml#/components/responses/404'
    '411':
      $ref: 'TS29122_CommonData.yaml#/components/responses/411'
    '413':
      $ref: 'TS29122_CommonData.yaml#/components/responses/413'
    '415':
      $ref: 'TS29122_CommonData.yaml#/components/responses/415'
    '429':
      $ref: 'TS29122_CommonData.yaml#/components/responses/429'
    '500':
      $ref: 'TS29122_CommonData.yaml#/components/responses/500'
    '503':
      $ref: 'TS29122_CommonData.yaml#/components/responses/503'
    default:
      $ref: 'TS29122_CommonData.yaml#/components/responses/default'

delete:
  summary: Delete an Individual Service Continuity Information Subscriptions resource
  operationId: DeleteIndServiceContinuityInfo
  tags:

```

```

- Individual Service Continuity Information Subscription (Document)
responses:
  '204':
    description: The individual subscription is deleted.
  '307':
    $ref: 'TS29122_CommonData.yaml#/components/responses/307'
  '308':
    $ref: 'TS29122_CommonData.yaml#/components/responses/308'
  '400':
    $ref: 'TS29122_CommonData.yaml#/components/responses/400'
  '401':
    $ref: 'TS29122_CommonData.yaml#/components/responses/401'
  '403':
    $ref: 'TS29122_CommonData.yaml#/components/responses/403'
  '404':
    $ref: 'TS29122_CommonData.yaml#/components/responses/404'
  '429':
    $ref: 'TS29122_CommonData.yaml#/components/responses/429'
  '500':
    $ref: 'TS29122_CommonData.yaml#/components/responses/500'
  '503':
    $ref: 'TS29122_CommonData.yaml#/components/responses/503'
  default:
    $ref: 'TS29122_CommonData.yaml#/components/responses/default'

# Components

components:
  securitySchemes:
    oAuth2ClientCredentials:
      type: oauth2
      flows:
        clientCredentials:
          tokenUrl: '{tokenUrl}'
          scopes: {}

schemas:
  ServiceContinuityInfo:
    type: object
    description: Represents an Individual Service Continuity Information Subscription.
    properties:
      subsEvent:
        $ref: '#/components/schemas/EventType'
      notificationAddr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      pinId:
        type: string
        description: Identifies a PIN.
      expTime:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'
      suppFeat:
        $ref: 'TS29571_CommonData.yaml#/components/schemas/SupportedFeatures'
    required:
      - subsEvent
      - notificationAddr
      - pinId

  ServiceContinuityInfoPatch:
    type: object
    description: Represents the partial update of Individual Service Continuity Information.
    properties:
      subsEvent:
        $ref: '#/components/schemas/EventType'
      notificationAddr:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/Uri'
      pinId:
        type: string
        description: Identifies a PIN.
      expTime:
        $ref: 'TS29122_CommonData.yaml#/components/schemas/DateTime'

  ServiceContinuityInfoNotification:
    type: object
    description: Represent the service continuity information for notification.
    properties:
      subsId:
        type: string
        description: >

```

Identifies the individual service continuity information subscription for which the service continuity information notification is delivered.

repInfo:
 \$ref: '#/components/schemas/ServiceContinuityReportInfo'
required:
 - subsId
 - repInfo

ServiceContinuityReportInfo:
type: object
description: List of notifications that include the information of the service continuity.
properties:
 acId:
 type: string
 description: Identifies an application client identifier.
 pinId:
 type: string
 description: Identifies a PIN.
 pegcId:
 type: string
 description: Identifies a PEGC.
 serviceId:
 type: string
 description: Identifies a PIN service.
 sessionId:
 type: string
 description: Identifies an application session.
 targetPineId:
 type: string
 description: Identifies the PINE.
 sessionDes:
 \$ref: 'TS29122_CommonData.yaml#/components/schemas/FlowInfo'
required:
 - acId
 - pinId
 - pegcId
 - serviceId
 - sessionId
 - targetPineId

ENUMERATIONS
#

EventType:
 anyOf:
 - type: string
 enum:
 - SERVICE_CONTINUITY_INFO
 - type: string
 description: >
 This string provides forward-compatibility with future extensions to the enumeration and is not used to encode content defined in the present version of this API.
 description: |
 Indicates service continuity happens in a PIN.
 Possible values are:
 - SERVICE_CONTINUITY_INFO: Indicates service continuity happens in a PIN.

Annex B (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2023-03	CT3#126					TS skeleton for Application layer support for Personal IoT Network (PINAPP); Personal IoT Network (PIN) Server Services.	0.0.0
2023-04	CT3#127e	C3-231511				Inclusion of C3-231265	0.1.0
2023-09	CT3#129	C3-233739				Inclusion of C3-233576, C3-233688, C3-233689, C3-233690 Editorial correction from the rapporteur.	0.2.0
2023-10	CT3#130	C3-234662				Inclusion of C3-234511, C3-234512, C3-234514, C3-234602, C3-234603 Editorial correction from the rapporteur.	0.3.0
2023-11	CT3#131	C3-235465				Inclusion of C3-235521, C3-235522, C3-235546, C3-235552 Editorial correction from the rapporteur.	0.4.0
2023-12	CT#102	CP-233291				Presentation to TSG CT for information.	1.0.0
2024-03	CT3#133	C3-241655				Inclusion of C3-241545, C3-241546, C3-241547, C3-241575, C3-241592 Editorial correction from the rapporteur.	1.1.0
2024-03	CT#103	CP-240216				Presentation to TSG CT for approval.	2.0.0
2024-03	CT#103	CP-240216				Approved by TSG CT.	18.0.0
2024-06	CT#104	CP-241110	0001	1	F	Clarification on procedure name in overview clause	18.1.0
2024-06	CT#104	CP-241110	0002	3	F	Correction on Service Switch Information Update	18.1.0
2024-06	CT#104	CP-241110	0003	1	F	Several OpenAPI Corrections	18.1.0
2024-06	CT#104	CP-241110	0004	-	F	Corrections to the data structures in the response body.	18.1.0
2024-06	CT#104	CP-241110	0005	2	F	Corrections to PIN_ASRegistration data model and open API	18.1.0
2024-06	CT#104	CP-241110	0006	1	F	Corrections on PIN_ASRegistration API	18.1.0
2024-06	CT#104	CP-241110	0007	1	F	Corrections on PIN_ASServiceContinuity API	18.1.0
2024-06	CT#104	CP-241110	0008	1	F	Corrections on PIN_ASServiceSwitch API	18.1.0
2024-06	CT#104	CP-241086	0009	-	F	Update of info and externalDocs fields	18.1.0
2024-07	CT#104					Correction to fix OpenAPI parsing errors	18.1.1

History

Document history		
V18.0.0	May 2024	Publication
V18.1.1	August 2024	Publication