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**5G;**  
**Application layer support for Personal IoT Network (PINAPP);**  
**Personal IoT Network (PIN) server services**  
**(3GPP TS 29.583 version 18.0.0 Release 18)**



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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].

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# 2 References

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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".

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# 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].

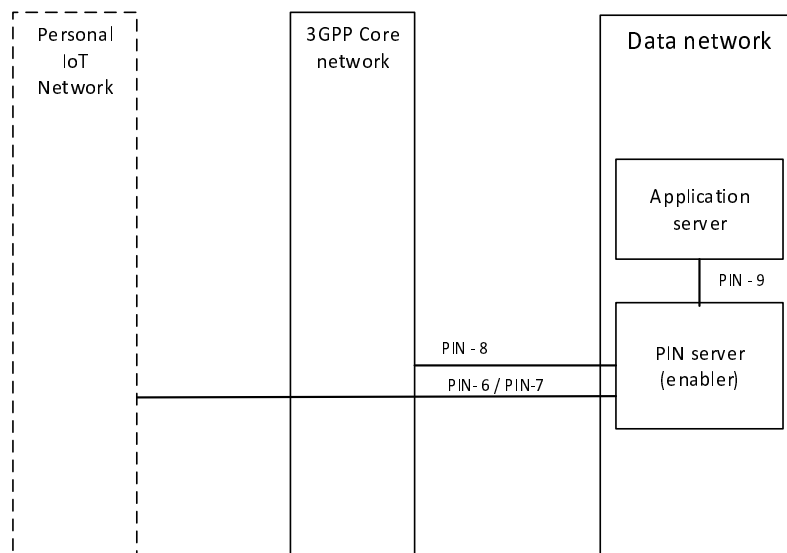
PAS	PIN Application Server
PEGC	PIN Element with Gateway Capability
PIN	Personal IoT Network
PINAPP	Personal IoT Network Application

## 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 application server registration management procedure;
- support application server service switch subscription procedure; and
- support application server service continuity subscription procedure.

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

Table 5.1-1: List of PIN server APIs

Service Name	Service Operations	Operation Semantics	Consumer(s)
PIN_ASRegistration	Request	Request/Response	e.g. PAS
	Update	Request/Response	e.g. PAS
	Deregister	Request/Response	e.g. PAS
PIN_ASServiceSwitch	Subscribe	Request/Response	e.g. PAS
	Notify	Request	e.g. PAS
	Update	Request/Response	e.g. PAS
	Delete	Request/Response	e.g. PAS
PIN_ASServiceContinuity	Subscribe	Request/Response	e.g. PAS
	Notify	Request	e.g. PAS
	Update	Request/Response	e.g. PAS
	Delete	Request/Response	e.g. PAS

Table 5.1-2 summarizes the corresponding PIN server APIs defined in this specification.

Table 5.1-2: 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 service producer (i.e. 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, as defined in 3GPP TS 23.542 [10], allows a PAS to register, update its registration and deregister at a given PIN server via PIN-9 interface.

#### 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**

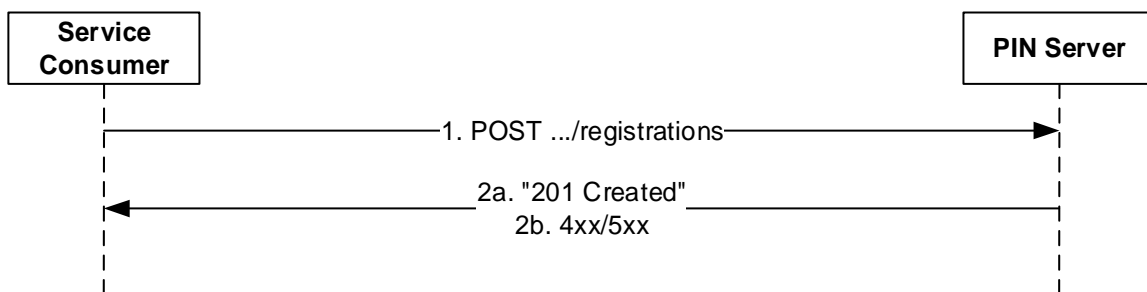
Service operation name	Description	Initiated by
PIN_ASRegistration_Request	This service operation is used by the service consumer to register to the PIN server.	e.g. PAS
PIN_ASRegistration_Update	This service operation is used by the service consumer to update the registration information to the PIN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

5.2.2.2.2 PAS Registration Creation



**Figure 5.2.2.2.2-1: Procedure for PAS Registration Creation**

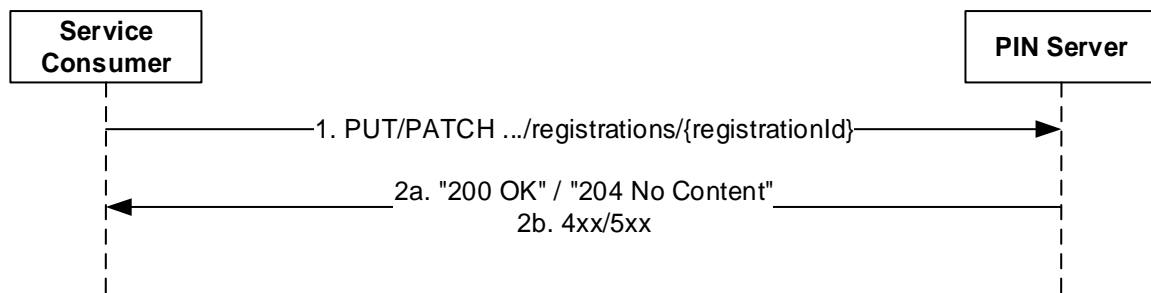
1. When the service consumer needs to register to the PIN server, the service consumer shall send the HTTP POST request message to the PIN Server targeting the "PAS Registrations" collection resource, with the request body including the PASRegistration data structure.
- 2a. Upon success, if the PAS is authorized, 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 PAS to update its 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**

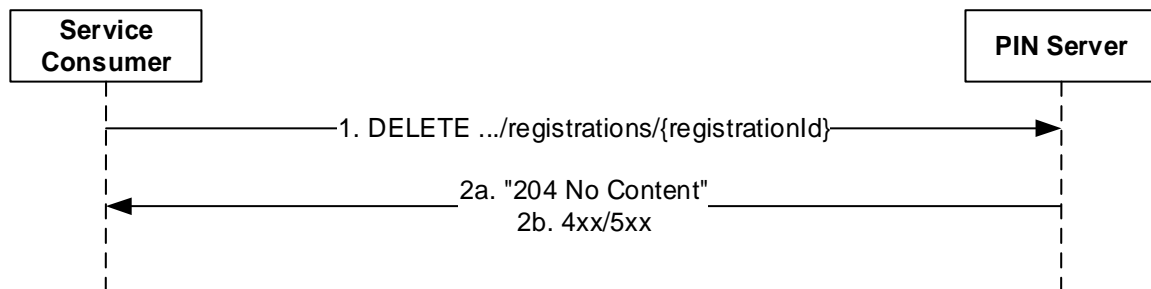
1. When the service consumer needs to update the registration information to the PIN server, the service consumer shall send the HTTP PUT/PATCH message to the PIN server targeting the "Individual PAS Registration" collection resource, with the request body including the PASRegistrationPatch data structure.
- 2a. Upon success, if the PAS is authorized, the PIN server shall respond with an HTTP PUT response including "200 OK" status code with the response body containing the fully updated PAS registration information of the resource within the PASRegistration data structure or HTTP PATCH response including "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 PAS 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. When the service consumer needs to deregister from the PIN server, the service consumer shall send an HTTP DELETE request to the PIN server targeting the corresponding "Individual PAS Registration" resource.
- 2a. Upon success, if the PAS is authorized, 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.

If the PIN server determines that the received HTTP DELETE request needs to be redirected, the PIN server may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative PIN server where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2].

## 5.3 PIN\_ASServiceSwitch Service

### 5.3.1 Service Description

The PIN\_ASServiceSwitch API, as defined in 3GPP TS 23.542 [10], allows a PAS to obtain the information about the service switch at a given PIN server via PIN-9 interface.

### 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**

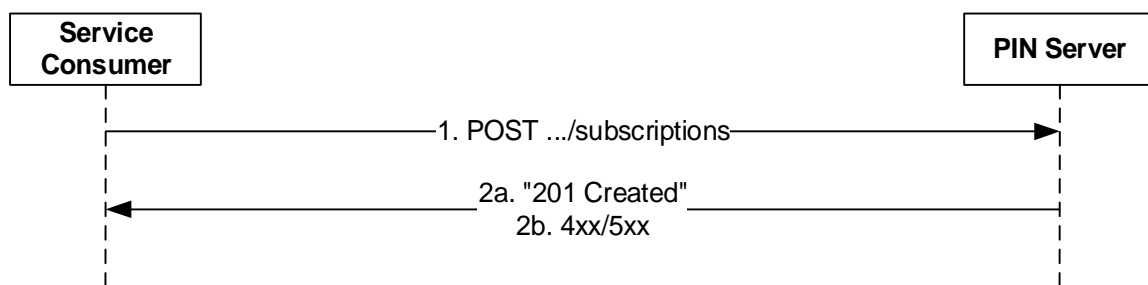
Service operation name	Description	Initiated by
PIN_ASServiceSwitch_Subscribe	This service operation is used by the PAS to subscribe to PIN server, for reporting of service switch information.	PAS
PIN_ASServiceSwitch_Notify	This service operation is used by the PIN server to notify the PAS about the service switch information.	PIN server
PIN_ASServiceSwitch_Update	This service operation is used by the PAS to update its subscription at PIN server, for reporting of service switch information.	PAS
PIN_ASServiceSwitch_Unsubscribe	This service operation is used by the PAS to remove its subscription at PIN server, for reporting of service switch information.	PAS

#### 5.3.2.2 PIN\_ASServiceSwitch\_Subscribe

##### 5.3.2.2.1 General

This service operation is used by the PAS to subscribe to PIN server, for reporting of 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. When the service consumer needs to subscribe to service switch information at the PIN server, the service consumer shall send the HTTP POST request message to the PIN Server targeting the "Service Switch Information Subscriptions" collection resource, with the request body including the ServiceSwitchInfo data structure.
- 2a. Upon success, if the PAS is authorized, 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.

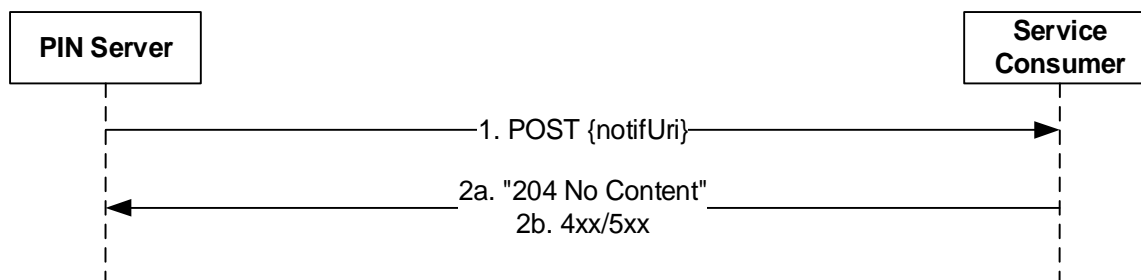
- 2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

### 5.3.2.3 PIN\_ASServiceSwitch\_Notify

#### 5.3.2.3.1 General

This service operation is used by the PIN server to notify the PAS about the service switch information.

#### 5.3.2.3.2 Service Switch Information Notification



**Figure 5.3.2.3.2-1: Procedure for Service Switch Information Notification**

1. When the service consumer needs to notify the service switch information at the PIN server, the service consumer shall send the HTTP POST request message to the PIN Server targeting the "Service Switch Information Subscriptions" collection resource, with the request body including the ServiceSwitchInfoNotification data structure.
- 2a. Upon success, if the PAS is authorized, the PAS shall process the Service Switch Information Notification and shall respond to the PIN server with "204 No Content" message.
- 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 PAS to update a service switch subscription with the PIN Server.

#### 5.3.2.4.2 Service Switch Information Update

To update service switch information reporting subscription at the PIN server, the PAS shall send a HTTP PATCH or PUT message to the PIN server on resource URI identifying the "Individual Service Switch Information Subscription" resource representation, as specified in clause 6.2.3.3.3.2 for HTTP PATCH message and in clause 6.2.3.3.3.3 for HTTP PUT message.

The HTTP PUT message shall replace all properties in the existing resource with the service switch information subscription in the request.

The HTTP PATCH message shall modify the properties in the existing resource with the service switch information subscription information in the request.

Upon receiving the HTTP PUT or HTTP PATCH message from the PAS, the PIN server shall process the request message and verify whether the PAS is authorized to modify the requested subscription resource or not:

- a) if the PAS is authorized to modify the requested subscription resource, the PIN server shall:
  - 1) update the resource identified by Resource URI of the PAS service switch information subscription with the updated information received in the HTTP PATCH or PUT request message;

- 2) upon successful update of PAS service switch information, return the updated PAS service switch information subscription in the "200 OK" response message or respond with the "204 No Content" message indicating to the PAS that the PAS service switch information subscription is updated successfully. In the response message, the PIN server may provide an updated expiration time to indicate to the PAS when the updated subscription will automatically expire.

b) if the PAS is not authorized to modify the requested subscription resource, the PIN server shall:

- 1) take proper error handling actions, as specified in clause 6.2.7; and
- 2) send an HTTP response message with an appropriate error status code.

If the PIN server determines that the received HTTP PATCH or PUT message needs to be redirected, the PIN server may respond with an HTTP "307 Temporary Redirect" status code or an HTTP "308 Permanent Redirect" status code including an HTTP "Location" header containing an alternative URI representing the end point of an alternative PIN server where the message should be sent. Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2].

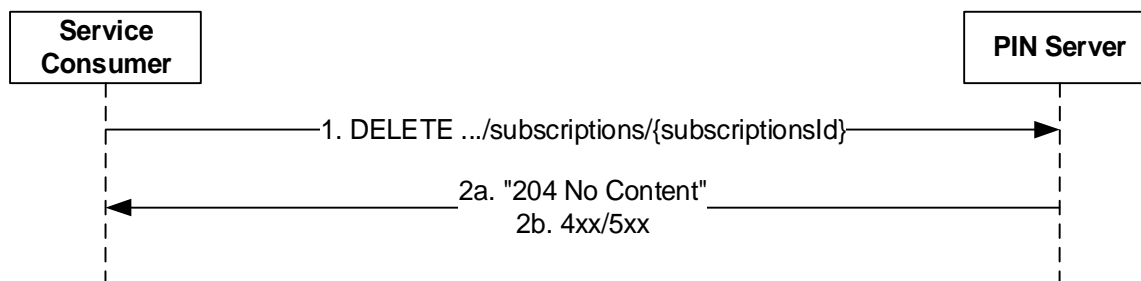
If the expiration time is provided, then to maintain the subscription, the PAS shall send an update subscription prior to subscription expiry time and the PIN server shall reset the expiration time in the PIN server. If the update subscription request is not sent before the expiry time, then the PIN server shall treat the PAS subscription as unsubscribed and remove the corresponding PAS service switch information subscription resource.

### 5.3.2.5 PIN\_ASServiceSwitch\_Unsubscribe

#### 5.3.2.5.1 General

This service operation is used by the PAS 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. When the service consumer needs to unsubscribe its service switch information subscription from the PIN server, 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, if the PAS is authorized, the PIN Server shall respond with an HTTP "204 No content" status code to indicate the successful removal of the subscription information.
- 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 API, as defined in 3GPP TS 23.542 [10], allows a PAS to obtain the information about the service continuity at a given PIN server via PIN-9 interface.



## 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**

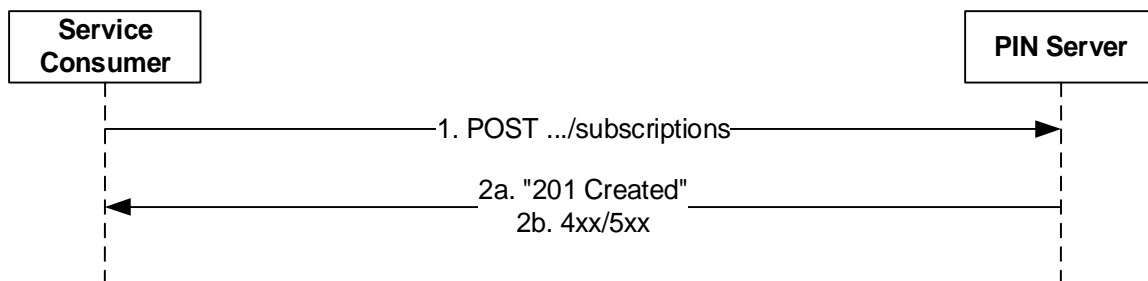
Service operation name	Description	Initiated by
PIN_ASServiceContinuity_Subscribe	This service operation is used by the PAS to subscribe to PIN server, for reporting of service continuity information.	PAS
PIN_ASServiceContinuity_Notify	This service operation is used by the PIN server to notify the PAS about the service continuity information.	PIN server
PIN_ASServiceContinuity_Update	This service operation is used by the PAS to update its subscription at PIN server, for reporting of service continuity information.	PAS
PIN_ASServiceContinuity_Unsubscribe	This service operation is used by the PAS to remove its subscription at PIN server, for reporting of service continuity information.	PAS

### 5.4.2.2 PIN\_ASServiceContinuity\_Subscribe

#### 5.4.2.2.1 General

This service operation is used by the PAS 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**

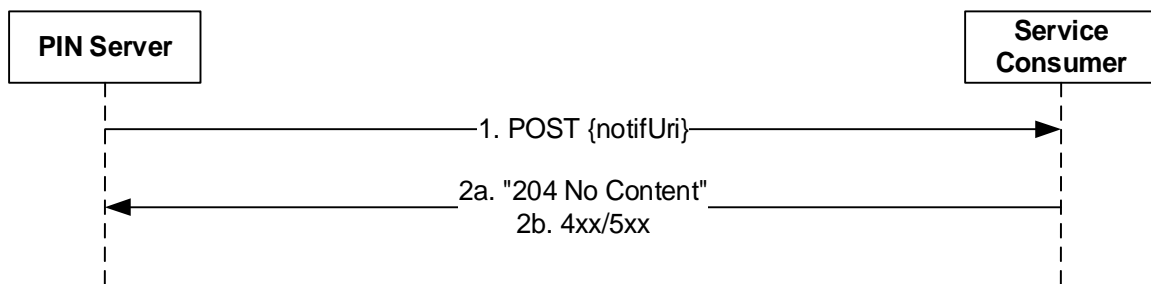
1. When the service consumer needs to subscribe to service continuity information at the PIN server, the service consumer shall send the HTTP POST request message to the PIN Server targeting the "Service Continuity Information Subscriptions" collection resource, with the request body including the ServiceContinuityInfo data structure.
- 2a. Upon success, if the PAS is authorized, 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 PAS 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**

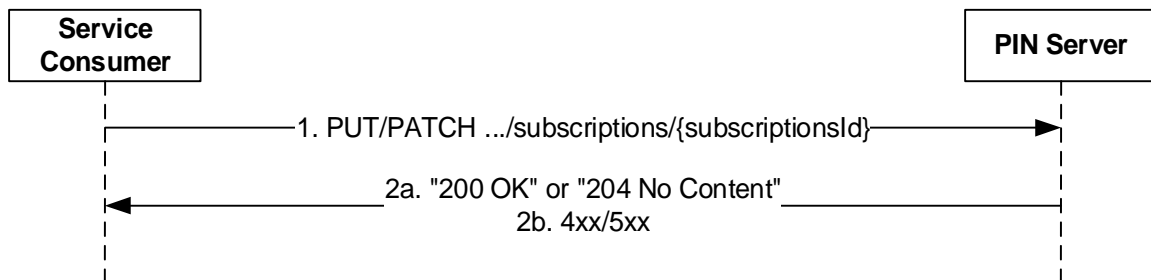
1. When the service consumer needs to notify the service continuity information at the PIN server, the service consumer shall send the HTTP POST request message to the PIN Server targeting the "Service Continuity Information Subscriptions" collection resource, with the request body including the ServiceContinuityInfoNotification data structure.
- 2a. Upon success, if the PAS is authorized, the PAS shall process the Service Continuity Information Notification and shall respond to the PIN server with "204 No Content" message.
- 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 PAS to update a service continuity subscription with the PIN Server.

#### 5.5.2.4.2 Service Continuity Information Update



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

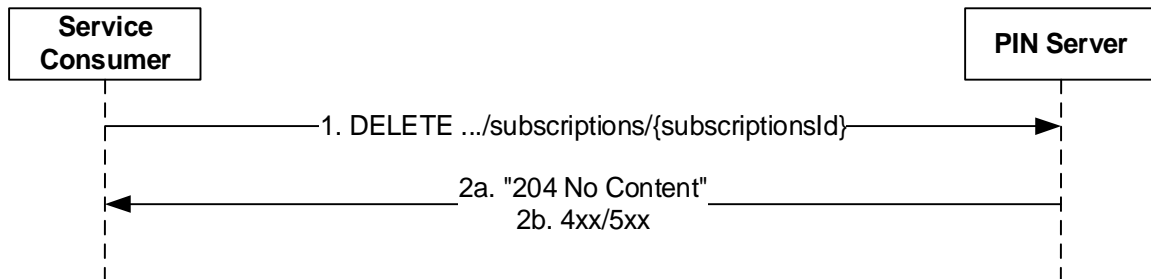
1. When the service consumer needs to update service continuity information reporting subscription at the PIN server, the service consumer shall send the HTTP PATCH or HTTP PUT request message to the PIN Server targeting the "Individual Service Continuity Information Subscription" collection resource, with the request body including the ServiceContinuityInfo data structure.
- 2a. Upon success, if the PAS is authorized, the PIN Server shall respond with an HTTP "204 No content" or an HTTP "200 OK" status code with the response body containing a representation of the created "Individual Service Continuity Information Subscription" resource within the ServiceContinuityInfoPatch 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.

## 5.4.2.5 PIN\_ASServiceContinuity\_Unsubscribe

### 5.4.2.5.1 General

This service operation is used by the PAS 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. When the service consumer needs to unsubscribe its service continuity information subscription from the PIN server, the service consumer shall send the HTTP DELETE request message to the PIN Server targeting the "Individual Service Continuity Information Subscription" collection resource.
- 2a. Upon success, if the PAS is authorized, the PIN Server shall respond with an HTTP "204 No content" status code to indicate the successful removal of the subscription information.
- 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

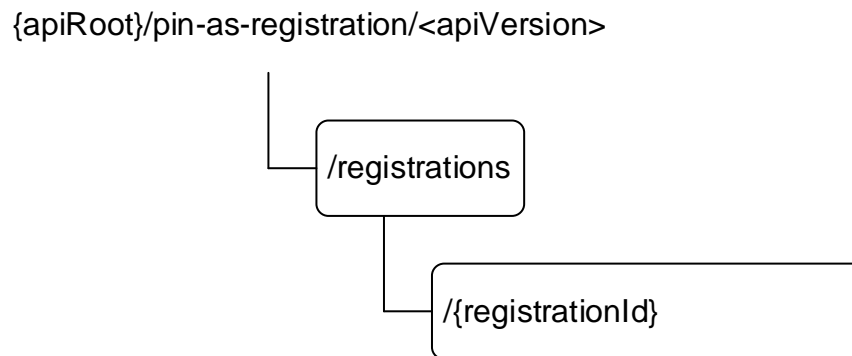
The provisions of clause 5.2.2 of 3GPP TS 29.122 [2] shall apply for the PIN\_ASRegistration API.

### 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.



**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 purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
PAS Registrations	/registrations	POST	Register a new PAS at the PIN server.
Individual PAS Registration	/registrations/{registrationId}	GET	Fetch an individual PAS registration resource.
		PUT	Fully replace an individual PAS registration resource.
		PATCH	Partially modify an individual PAS registration resource.
		DELETE	Remove an 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

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	PAS information is successfully registered to the PIN server. 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 POST method on this resource**

Name	Data type	P	Cardinality	Description
n/a				

**Table 6.1.3.2.3.1-5: 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}

**Table 6.1.3.2.3.1-6: Links supported by the 200 Response Code on this endpoint**

Name	Resource name	HTTP method or custom operation	Link parameter(s)	Description
n/a				

#### 6.1.3.2.4 Resource Custom Operations

None.

#### 6.1.3.3 Resource: Individual PAS Registration

##### 6.1.3.3.1 Description

This Individual PAS Registration resource represents an individual PAS registered at a given 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	Identifies a PAS registration.

#### 6.1.3.3.3 Resource Standard Methods

##### 6.1.3.3.3.1 GET

This method retrieves the PAS information registered 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	The PAS registration information at the PIN server.
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 GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method updates the PAS registration information at the PIN server by completely replacing the existing registration data. 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	Details of the PAS registration information to be updated.

**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	The Individual PAS registration information updated successfully and the updated PAS registration information is returned in the response.
n/a			204 No Content	The Individual PAS registration information updated successfully.
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 PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method deregisters a PAS registration from 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: Data structures supported by the DELETE Response Body on this resource**

Data type	P	Cardinality	Response codes	Description
n/a			204 No Content	The individual PAS registration information matching the registrationId is 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 6.1.3.3.3-4: 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 6.1.3.3.3-5: 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

This method partially updates the PAS registration information 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	Details of the PAS registration information to be updated

**Table 6.1.3.3.4-3: Data structures supported by the PATCH Response Body on this resource**

Data type	P	Cardinality	Response codes	Description
PASRegistration	M	1	200 OK	The Individual PAS registration information was updated successfully and the updated PAS registration information is returned in the response.
n/a			204 No Content	The Individual PAS registration information was updated successfully.
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 PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.				

**Table 6.1.3.3.4-4: 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 6.1.3.3.4-5: 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 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.	
supFeat	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.

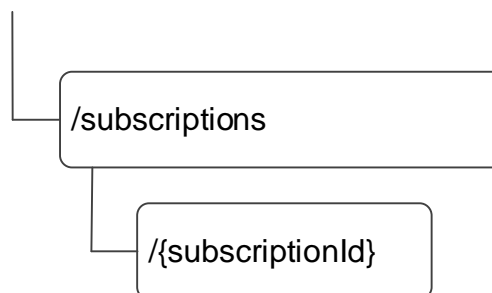
## 6.2.3 Resources

### 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.

**{apiRoot}/pin-as-serviceswitch/<apiVersion>**



**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 purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
Service Switch Information Subscriptions	/subscriptions	POST	Create a subscription for reporting of service switch information to the PAS.
Individual Service Switch Information Subscription	/subscriptions/{subscriptionId}	GET	Retrieve the Individual service switch information subscription identified by subscriptionId.
		PUT	Fully replace the individual service switch information subscription identified by subscriptionId.
		PATCH	Partially update the individual service switch information subscription identified by subscriptionId.
		DELETE	Remove the individual service switch information subscription identified by subscriptionId.

## 6.2.3.2 Resource: Service Switch Information Subscriptions

### 6.2.3.2.1 Description

This resource represents all service switch information subscriptions at a given 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

This method creates the service switch information subscription at the PIN server for reporting of the service switch information. 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	Create a new 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	The individual service switch information subscription resource created successfully. The information about the confirmed subscription at the PIN server is provided in the response body.  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}

**Table 6.2.3.2.3.1-5: Links supported by the 200 Response Code on this endpoint**

Name	Resource name	HTTP method or custom operation	Link parameter(s)	Description
n/a				

#### 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 of a PAS at a given 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	Identifies an individual service switch information subscription.

#### 6.2.3.3.3 Resource Standard Methods

##### 6.2.3.3.3.1 GET

This method retrieves the service switch information subscription information 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	The service switch information subscription information is returned by the PIN server.
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 GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method partially updates the individual service switch information subscription information 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
ServiceSwitchInfo Patch	M	1	Request to partially update the individual service information subscription matching the subscriptionId at the PIN server.

**Table 6.2.3.3.3.2-3: Data structures supported by the PATCH Response Body on this resource**

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	200 OK	The individual service switch information subscription matching the subscriptionId was modified successfully and the updated service switch information subscription information is returned in the response.
n/a			204 No Content	The individual service switch information subscription matching the subscriptionId was modified successfully.
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 PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.				

**Table 6.2.3.3.3.2-4: 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 6.2.3.3.3.2-5: 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.

### 6.2.3.3.3.3 PUT

This method updates the service switch information subscription information at the PIN server by completely replacing the existing subscription data. This method shall support the URI query parameters specified in the table 6.2.3.3.3.3-1.

**Table 6.2.3.3.3.3-1: 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 6.2.3.3.3.3-2 and the response data structures and response codes specified in table 6.2.3.3.3.3-3.

**Table 6.2.3.3.3.3-2: Data structures supported by the PUT Request Body on this resource**

Data type	P	Cardinality	Description
ServiceSwitchInfo	M	1	Details of individual service switch information subscription matching the subscriptionId to be updated at the PIN server.

**Table 6.2.3.3.3.3-3: Data structures supported by the PUT Response Body on this resource**

Data type	P	Cardinality	Response codes	Description
ServiceSwitchInfo	M	1	200 OK	The individual service switch information subscription matching the subscriptionId was modified successfully and the updated service switch subscription information is returned in the response.
n/a			204 No Content	The individual service switch information subscription matching the subscriptionId was modified successfully.
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 PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] also apply.

**Table 6.2.3.3.3.3-4: 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 6.2.3.3.3.3-5: 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.

#### 6.2.3.3.3.4 DELETE

This method removes the service switch information subscription information from 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	M	1	204 No Content	The individual service switch information subscription matching the subscriptionId is 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.

### 6.2.3.3.3 Resource Custom Operations

None.

### 6.2.4 Custom Operations without associated resources

None.

## 6.2.5 Notifications

### 6.2.5.1 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	Notifies the subscriber PAS the service switch information.

### 6.2.5.1 Service Switch Information Notification

#### 6.2.5.1.1 Description

Service Switch Information Notification is used by the PIN server to notify a PAS with service switch information matching the filter criteria.

#### 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	Callback reference provided by the PAS during service switch information subscription creation or update procedure.

#### 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	Notification of service switch information.

**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	The receipt of the Notification is 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 6.1.6.1-1 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
subslId	string	M	1	Identifies the individual service switch information subscription for which the service switch information notification is delivered.	
replInfo	ServiceSwitchReportInfo	M	1	List of service switch report information applicable to the subscription identifier.	

## 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
acId	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

No specific application errors for the PIN\_ASServiceSwitch API are specified.

## 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.

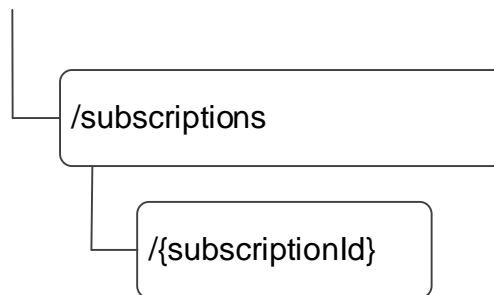
### 6.3.3 Resources

#### 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 purpose/name	Resource URI (relative path after API URI)	HTTP method or custom operation	Description (service operation)
Service Continuity Information Subscriptions	/subscriptions	POST	Create a subscription for reporting of service continuity information to the PAS.
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 all service continuity information subscriptions at a given 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

This method creates the service continuity information subscription at the PIN server for reporting of the service continuity information. 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	Create 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	The individual service continuity information subscription resource created successfully. The information about the confirmed subscription at the PIN server is provided in the response body.  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 6.3.3.2.3.1-4: 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}

**Table 6.3.3.2.3.1-5: Links supported by the 200 Response Code on this endpoint**

Name	Resource name	HTTP method or custom operation	Link parameter(s)	Description
n/a				

#### 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 the individual service continuity information subscription of a PAS at a given 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	Identifies an individual service continuity information subscription.

#### 6.3.3.3.3 Resource Standard Methods

##### 6.3.3.3.3.1 GET

This method retrieves the service continuity information subscription information 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	The service continuity information subscription information is returned by the PIN server.
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 GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method partially updates the individual service continuity information subscription information 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	Request to partially update the individual service information subscription matching the subscriptionId at the PIN server.

**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	The individual service continuity information subscription matching the subscriptionId was modified successfully and the updated service continuity information subscription information is returned in the response.
n/a			204 No Content	The individual service continuity information subscription matching the subscriptionId was modified successfully.
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 PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method updates the service continuity information subscription information at the PIN server by completely replacing the existing subscription data. 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	Details of individual service continuity information subscription matching the subscriptionId to be updated at the PIN server.

**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	The individual service continuity information subscription matching the subscriptionId was modified successfully and the updated service continuity subscription information is returned in the response.
n/a			204 No Content	The individual service continuity information subscription matching the subscriptionId was modified successfully.
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 PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] 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

This method removes the service continuity information subscription information from 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	M	1	204 No Content	The individual service continuity information subscription matching the subscriptionId is 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 6.3.3.3.4-4: 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.

### 6.3.3.3.3 Resource Custom Operations

None.

### 6.3.4 Custom Operations without associated resources

None.

### 6.3.5 Notifications

#### 6.3.5.1 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	Notifies the subscriber PAS the service continuity information.



## 6.3.5.1 Service Continuity Information Notification

### 6.3.5.1.1 Description

Service Continuity Information Notification is used by the PIN server to notify a PAS with service continuity information matching the filter criteria.

### 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	Callback reference provided by the PAS during service continuity information subscription creation or update procedure.

### 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	Notification of service continuity information.

**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	The receipt of the Notification is 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 6.3.5.1.3.1-3: 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 6.1.6.1-1 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	6.3.6.3.2	Represents the service continuity information subscription.	
ServiceContinuityInfoPatch	6.3.6.3.3	Used to request the partial update of service continuity information subscription.	
ServiceContinuityInfoNotification	6.3.6.3.4	Service continuity information for notification	
ServiceContinuityReportInfo	6.3.6.3.5	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 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.	
supFeat	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.	

## 6.3.6.2.3 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

No specific application errors for the PIN\_ASServiceContinuity API are specified.

## 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: PINServer PAS Registration_API
  version: 1.0.0-alpha.7
  description: |
    API for PAS registration to PIN server.
    © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
    All rights reserved.
```

```
externalDocs:
```

```
  description: >
    3GPP TS 29.583 V18.0.0; 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/'
```

```
security:
```

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

```
servers:
```

```
  - url: '{apiRoot}/pin-as-registration/v1'
    variables:
      apiRoot:
        default: https://example.com
        description: apiRoot as defined in clause 6.3 of 3GPP TS 29.583.
```

```
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}:
  get:
    summary: Get an Individual PAS Registration
    operationId: GetIndPASReg
    tags:
      - Individual PAS Registration (Document)
    description: Retrieve an Individual PAS registration resource.
    parameters:
      - name: registrationId
        in: path
        description: Registration Id.
        required: true
        schema:
          type: string
    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: Update an Individual PAS Registration
    operationId: UpdateIndPASReg

```



```

tags:
  - Individual PAS Registration (Document)
description: Fully replace an existing PAS Registration resource.
parameters:
  - name: registrationId
    in: path
    description: PAS Registration Id.
    required: true
    schema:
      type: string
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)
  description: Partially update an existing PAS Registration resource.
  parameters:
    - name: registrationId
      in: path
      description: PAS registration Id.
      required: true
      schema:
        type: string
  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)
description: Delete an existing PAS registration at PIN server.
parameters:
  - name: registrationId
    in: path
    description: Registration Id.
    required: true
    schema:
      type: string
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:
  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: PINServer Service Switch Information_API
version: 1.0.0-alpha.6
description: |
  API for PINServer Service Switch Information Reporting.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.

```

externalDocs:

```

description: >
  3GPP TS 29.583 V18.0.0; 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/'

```

security:

```

- {}
- oAuth2ClientCredentials: []

```

servers:

```

- url: '{apiRoot}/pin-as-serviceswitch/v1'

```

```

variables:
  apiRoot:
    default: https://example.com
    description: apiRoot as defined in clause 6.2.1 of 3GPP TS 29.583.

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 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:
        ServiceSwitchInfoNotification:
          '{request.body#/notificationAddr}':
            post:
              requestBody: # contents of the callback message
                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}:
  get:
    summary: Read an Individual Service Switch Information Subscriptions resource
    operationId: ReadIndServiceSwitchInfo
    tags:
      - Individual Service Switch Information Subscription (Document)
    description: Retrieve an Individual Service Switch information subscription information.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    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: Update an Individual Service Switch Information Subscriptions resource
    operationId: UpdateIndServiceSwitchInfo
    tags:
      - Individual Service Switch Information Subscription (Document)
    description: Fully replace an existing Individual Service Switch information Subscription.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    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)
  description: Partially update an existing Individual ServiceSwitch information.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  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)
description: Delete an existing Individual ServiceSwitchinformation Subscription.
parameters:
- name: subscriptionId
  in: path
  description: Subscription Id.
  required: true
  schema:
    type: string

```

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:

```

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

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 happens in a PIN.
    Possible values are:
    - SERVICE_SWITCH_INFO: Indicates service switch happens in a PIN.

```



## A.4 PIN\_ASServiceContinuity API

openapi: 3.0.0

info:

```
title: PINServer Service Continuity Information_API
version: 1.0.0-alpha.6
description: |
  API for PINServer Service Continuity Information Reporting.
  © 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).
  All rights reserved.
```

externalDocs:

```
description: >
  3GPP TS 29.583 V18.0.0; 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/'
```

security:

```
- {}
- OAuth2ClientCredentials: []
```

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.
```

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: # contents of the callback message
            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}:
  get:
    summary: Read an Individual Service Continuity Information Subscriptions resource
    operationId: ReadIndServiceContinuityInfo
    tags:
      - Individual Service Continuity Information Subscription (Document)
    description: Retrieve an Individual Service Continuity information subscription information.
    parameters:
      - name: subscriptionId
        in: path
        description: Subscription Id.
        required: true
        schema:
          type: string
    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)
  description: Fully replace an existing Individual Service Continuity information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  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)
  description: Partially update an existing Individual ServiceContinuity information.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  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)
  description: Delete an existing Individual Service Continuity information Subscription.
  parameters:
    - name: subscriptionId
      in: path
      description: Subscription Id.
      required: true
      schema:
        type: string
  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:
```

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    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

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

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# History

<b>Document history</b>		
V18.0.0	May 2024	Publication