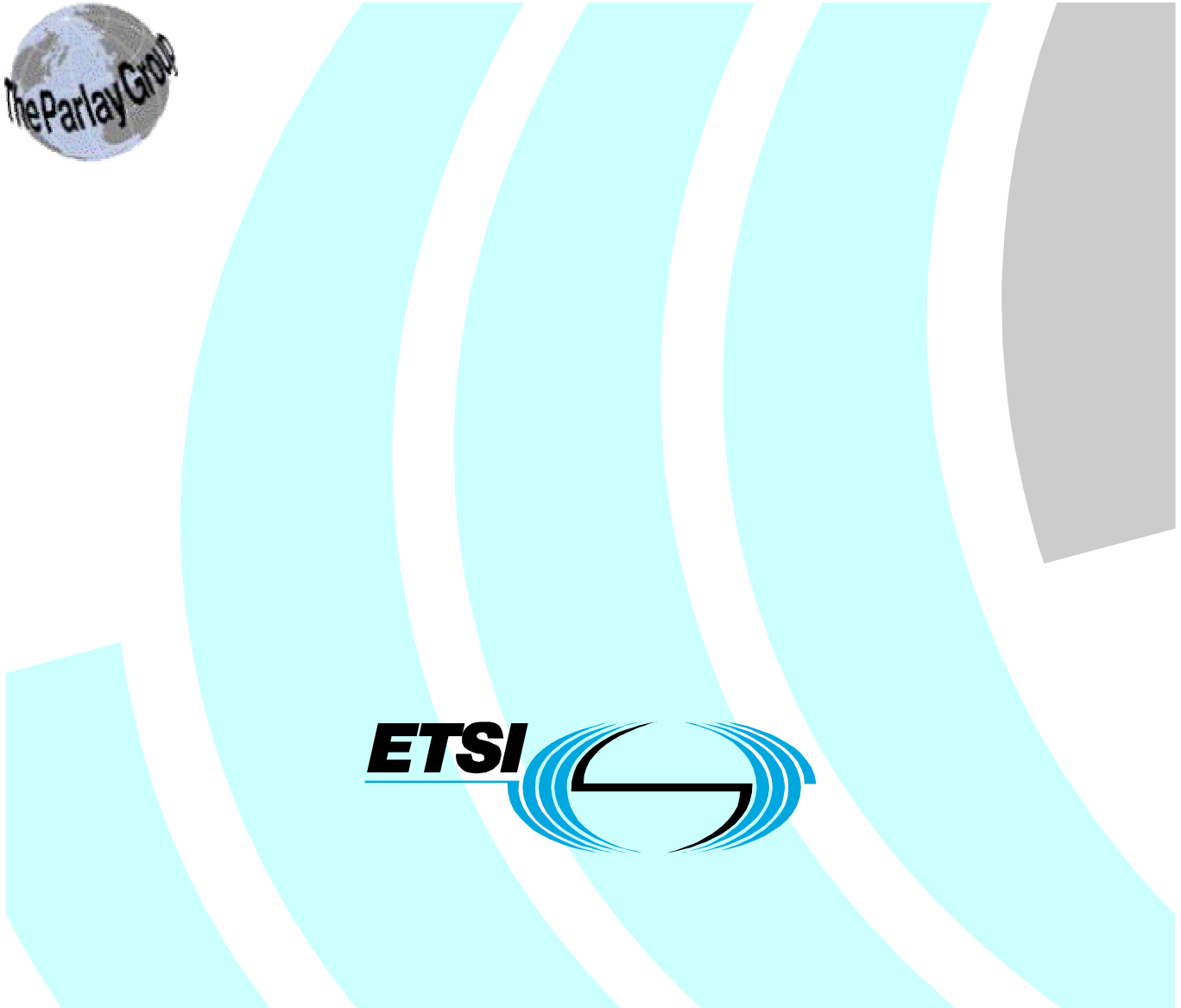
Final draft ETSI ES 202 915-14 V1.1.1 (2002-11)

ETSI Standard

Open Service Access (OSA);
Application Programming Interface (API);
Part 14: Presence and Availability Management SCF



Reference
DES/SPAN-120091-14

Keywords
API, IDL, OSA, UML

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, send your comment to:
editor@etsi.org

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 14 of a multi-part deliverable covering Open Service Access (OSA); Application Programming Interface (API), as identified below. The API specification (ES 202 915) is structured in the following parts:

Part 1: "Overview";

Part 2: "Common Data Definitions";

Part 3: "Framework";

Part 4: "Call Control";

Part 5: "User Interaction SCF";

Part 6: "Mobility SCF";

Part 7: "Terminal Capabilities SCF";

Part 8: "Data Session Control SCF";

Part 9: "Generic Messaging SCF";

Part 10: "Connectivity Manager SCF";

Part 11: "Account Management SCF";

Part 12: "Charging SCF";

Part 13: "Policy Management SCF";

Part 14: "Presence and Availability Management SCF".

The present document has been defined jointly between ETSI, The Parlay Group (http://www.parlay.org) and the 3GPP, in co-operation with a number of JAIN™ Community (http://www.java.sun.com/products/jain) member companies.

The present document forms part of the Parlay 4 set of specifications.

A subset of the present document is in 3GPP TS 29.198-14 V5.1.0 (Release 5).

1 Scope

The present document is part 14 of the Stage 3 specification for an Application Programming Interface (API) for Open Service Access (OSA).

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

The present document specifies the Presence and Availability Management Service Capability Feature (SCF) aspects of the interface. All aspects of the Presence and Availability Management SCF are defined here, these being:

- Sequence Diagrams
- Class Diagrams
- Interface specification plus detailed method descriptions
- State Transition diagrams
- Data Definitions
- IDL Description of the interfaces

The process by which this task is accomplished is through the use of object modelling techniques described by the Unified Modelling Language (UML).

2 References

The references listed in clause 2 of ES 202 915-1 contain provisions which, through reference in this text, constitute provisions of the present document.

ETSI ES 202 915-1: "Open Service Access (OSA); Application Programming Interface (API); Part 1: Overview".

ETSI ES 202 915-2: "Open Service Access (OSA); Application Programming Interface (API); Part 2: Common Data Definitions".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 202 915-1 apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ES 202 915-1 apply.

4 Presence and Availability Management SCF

4.1 Introduction

The goal of these interfaces is to establish a standard for maintaining, retrieving and publishing information about

- Digital identities,
- Characteristics and presence status of agents (representing capabilities for communication, content delivery, etc.),
- Capabilities and state of entities, and
- Presence and Availability of entities for various forms of communication and the contexts in which they are available.

Establishing such a standard in the industry will facilitate creation of many inter-operable services over multiple network technologies and, in addition, allow end users greater flexibility in managing their services and communication capabilities while addressing their privacy concerns.

4.2 Motivation

Consider the following simple but desirable scenario for a communication service: An end-user wishes to receive instant messages from her management at any time on her mobile phone, from co-workers only on her desktop computer, and in certain cases for the messages to be forwarded to e-mail or even a fax machine/printer. The senders may know her availability for various forms of communication in the way she chooses to reveal it or alternatively the senders may never know how she will be receiving their messages. This scenario spans over multiple services and protocols and can only be solved currently by a proprietary solution that maintains the required information in an ad-hoc fashion within the application.

PAM is not a replacement for the protocols being standardized for various communication and network services. PAM attempts to standardize the management and sharing of presence and availability information across multiple services and networks.

The PAM specification is motivated by the observations that

- The notions of Identity, Presence and Availability are common to but independent of the various communication technologies, protocols and applications that provide services using these technologies.
- Presence does not necessarily imply availability. End-users or organizations require greater control over making themselves available through various communication devices.
- Presence based services need to address privacy concerns on who can access presence information and under what conditions.

Management of availability will span over multiple communication services and service providers.

4.3 Goals

The main goal of Presence and Availability Management is to facilitate the development of a rich set of applications and services that span over multiple communication systems (instant messaging, e-mail, fax, telephony, etc.) and to provide the end user greater flexibility and control in managing their communications. A standardized platform allows software developers to create communication management applications that are independent of the underlying technologies and protocols.

As the next step in the evolution of directory and database enabled applications and services, separation of the management of identities and availability of users or organizations from specific applications enables uniform and centralized administration of data and creates the potential to bring control over communication services to the user's desktops.

The purpose of the present document is to adopt the first release of a Presence and Availability Management interface specification created by an industry consortium, PAMforum, established for this purpose harmonized with the IETF model for presence (RFC 2778). The present document is also consistent with the ongoing work in 3GPP for defining the requirements and architecture for a standard presence service in the network.

With a desired goal of rapid acceptance and usage, the specification has been deliberately designed to be as simple as possible with an attempt to include a minimal set of functionality that is sufficient for use in non-trivial applications. Often, this has been at the cost of some useful features, which would have made the specification baroque and cumbersome if not controversial.

4.4 Concepts

This clause briefly describes the various concepts involved in the present document to serve as the context for the rest of the document.

4.4.1 Identity

Identity, for purposes of the PAM specification, is a limited electronic representation of an entity (i.e., an individual or an organization) that participates in PAM-enabled applications and services. This concept corresponds to the concept of Presentity as described in the IETF Common Presence and Instant Messaging Model (RFC 2778).

The main characteristic of an entity that is central to PAM specifications is the name (or handle) by which entities are identified by applications and services. Entities may have multiple names, login ids, account names, etc., by which they are identified. As PAM attempts to abstract over multiple networks and services, it does not assume that a single name will necessarily identify entities across all application domains.

The generalized structure available in 3GPP for user names that may contain various formats for addressing has been adopted for these specifications.

To enable entities to be identified by any of the names associated with them, PAM identities can be assigned aliases. A name and a namespace pair can be defined as an alias of another name and namespace pair. It is important to note that aliases are just synonyms and hence have limited semantics. In particular, they are not powerful enough to model personas each with their own capabilities and privacy requirements.

An identity can represent a single entity or a group of identities. Group identities have similar semantics to non-group identities but, in addition, maintain a list of identities that constitute the group. As an example, a sales department may be modelled as a group identity with the identities of the members of the department being member identities of the group. Group identities and their member identities do not inherit anything from each other.

No other relationships between identities are within the scope of the PAM specifications.

For flexibility and extensibility, attribute lists are used to associate additional data with identities. Identities are typed to provide a way to manage such attribute lists. An identity type may be associated with a specific set of attributes and all identities of that type inherit instances of such attributes.

For consistency with IETF (RFC 2778) defined presence data models, PAM pre-defines an identity type Presentity with a list of presence attributes based on the definitions in RFC 2778.

PAM implementations may map certain existing directory and database data to one or more types to allow access via PAM interfaces. PAM specifications do not specify how the data within the profiles are to be stored. They may be stored within the PAM implementation or mapped to data stored on external directories and databases.

4.4.2 Agent

An agent, for PAM purposes, is a limited electronic representation of a software or hardware device through which identities manifest themselves or make themselves available to applications and services.

An important characteristic of an agent is a list of one or more capabilities associated with it. A capability is what makes an agent useful. A capability either represents the ability of an agent to participate in communications and content delivery (e.g.: instant messaging, SMS, WAP, voice) or it represents the ability of an agent to report useful information (e.g.: location, velocity, temperature, mood) of the environment around it.

PAM does not specify any pre-defined capabilities. Applications may define and use their own capabilities.

Agent instances are identified by names (or handles). As for identities, names exist in the context of a namespace. Within a namespace, a name is assumed to be unique. Two agent instances can have the same name as long as they are in different namespaces. For example, a mobile phone and a PDA manufactured by two different manufacturers may coincidentally have the same serial number by which they are identified. As PAM attempts to unify services over multiple technologies, it does not assume that a name uniquely identifies agent instances across all technologies or across all manufacturers. They can be disambiguated through the use of namespaces.

No relationships between agents are within the scope of the PAM specifications.

For flexibility and extensibility, attribute lists are used to associate additional data with agents. Agents are typed to provide a way to manage such attribute lists. An agent type may be associated with a specific set of attributes and all agents of that type inherit instances of such attributes.

PAM does not specify any pre-defined attributes or types. Applications may define and use their own agent types.

PAM implementations may map certain existing directory and database data to one or more types to allow access via PAM interfaces. PAM specifications do not specify how the data within the profiles are to be stored. They may be stored within the PAM implementation or mapped to data stored on external directories and databases.

Agent instances are associated with one or more identities. This association results in the inheritance of associated agents' capabilities by the identities.

4.4.3 Presence

The concept of presence has been used in several application areas, being most explicit in Instant Messaging. Starting from a simple notion of online/offline status, it has expanded to include other context information around the status such as disposition (out to lunch, away from the computer, etc.) and activity status (on the phone, idle, etc.). Location information, on the other hand, has largely been kept separate from what has been traditionally considered presence information. PAM specifications broaden the concepts of presence recognizing that all such information, including location, describes different contexts of an entity's existence. The unifying property is that the presence information is continually changing and that there is value in knowing the current information at different points in time for services and applications.

For the purposes of PAM specifications, presence is an extensible set of characteristics that captures the dynamic context in which an identity or an agent exists at any point in time. In contrast to the relatively static information about identities or agents (e.g., names, addresses, capabilities), presence refers to dynamic information such as location, status, disposition, etc. Registrations of presence and location information in existing applications are covered by this definition.

Presence information is differentiated from the more static information associated with identities and agents that are stored in attributes. The rationalization for this design is that the presence information is dynamic and has implications on the implementation. Some of the presence information is too dynamic to be maintained in static data stores such as directories and without this hint about the data characteristics, PAM implementers may make sub-optimal decisions on the way the data is stored. Second, presence information typically has expiration data that needs to be understood by the implementation.

The PAM specification recognizes that devices that provide presence information are not necessarily devices that communicate. Certain agents may report presence information but not be capable of communication. Certain agents may be communication devices but may not be able to provide presence information. In general, the presence of an identity is computed from presence information provided by one or more agents and the ability to communicate is derived from one or more communication-capable agents available to the identity.

The PAM specification does not specify the methods by which the presence information is derived. An agent may explicitly register its own presence information or the information may be derived from other network elements. For example, an instant messaging client on a desktop computer can register its status based on when a user is logged in. A mobile phone may do an explicit registration on a WAP server for instant messaging. The phone's presence for voice calls, on the other hand, may be inferred implicitly by querying the cellular network for the device being on when requested. The presence of an identity, on the other hand, may be computed using presence information from one or more devices owned by the identity.

Finally, the PAM specification does not require that the presence information be stored explicitly (i.e., in a materialized fashion) in a PAM implementation. An implementation may infer the presence information on demand from the underlying services or networks.

For compatibility with the presence model from IETF (RFC 2778), a type called Presentity is pre-defined with the attributes consistent with the IETF Presence model.

4.4.4 Availability

Availability is a property of an identity denoting its ability and willingness to share information about itself or to communicate with another identity based on factors such as the type of communication requested, the identity of the calling entity and the preferences and policies that are associated with the recipient. This is the primary means by which the current PAM specification enables controls for privacy. While presence is, in most applications, a necessity for availability, presence does not necessarily imply availability to all.

Availability is always with respect to a context. A context in PAM specifications is a set of attributes defining the state in which the availability is requested. For example, the query "Is Jane available for IM for Rob?" identifies the type of communication and the identity of the asker as the context. PAM allows for availability to be differentiated based on any attribute of a context. A context, "Communication" is pre-defined in PAM.

Most queries for presence in existing applications can be mapped into PAM availability queries to control the information being given out. Alternatively, queries can be mapped directly into PAM presence queries in situations where privacy controls and policies are not required or all presence data is open to the entity querying. This allows PAM specifications to be consistent with existing presence servers and to serve as the basis for presence services across multiple protocols while providing uniform and flexible privacy controls.

PAM specification does not specify whether the availability is computed on demand or stored explicitly. In some applications, the availability may be pre-computed and stored explicitly while in some, it may be computed at each request for availability.

While the PAM specification provides a mechanism to associate preferences with an Identity to control availability, it neither specifies the syntax and semantics of the preferences nor the process by which the availability is computed. These aspects are left to the implementation.

For example, a particular implementation may provide the facility to store preferences as rules such as "I prefer to receive my instant messages on my computer rather than my cell phone unless the message is from my boss or the computer is off, etc.".

As an example, a computation of availability for communication may consist of the following algorithm:

1) Find all devices of the identity being called that are capable of the specified form of communication AND have registered their presence status as available.

2) Evaluate the rules associated with the identity being called to select the preferred device(s) from the set of present devices determined in Step 1.

3) If there are any devices available satisfying Step 2, indicate the availability of the identity being called via the available devices.

An implementation can chose to provide one or more means to specify preferences. It is expected that if there is industry standardization on the specification of preferences, the implementations will support such a standard. This is currently outside the scope of PAM.

4.4.5 Events

Events are representations of certain identified occurrences related to the concepts described above. The PAM specification provides for registering interest (i.e., callbacks) in being notified of such occurrences. Any entity that subscribes to the Event is a "watcher" in the IETF terminology (RFC 2778). An implementation is expected to provide such notifications.

Examples of events include:

- Creation/deletion of an identity.

- Association of an agent instance with an identity.
- Change in presence status or location of an agent instance.
- Change in the presence information of an identity.
- Change in availability of an identity for a particular form of communication.

PAM specifications contain a set of pre-defined events. Each event is defined by a name of the event, a set of input attribute value pairs that must be provided when an event is registered for and a set of attribute value pairs that are included in the notifications sent out when the event of interest occurs.

4.5 Scope of PAM information

Presence and Availability Management has the following types of information in its scope:

- Identities, which consist of names and aliases of entities participating in communications.
- Agent information, which consists of names and communication capabilities of software and/or hardware devices.
- Agent provisioning, which consists of associations between instances of agents and identities.
- Presence information, which consists of an identity's or an agent's dynamic characteristics such as status and geographical location.
- Availability information, which consists of preferences associated with identities and computation of availability, based on the devices present and the current preferences.
- Notification of changes to the above pieces of information.
- Security issues for access to this information.

The PAM specification consists of interfaces to manage or access the above information.

The specification purposefully does not include:

- Storage design or storage requirements for any of the presence and availability information.

These are to be decided by specific implementations of the PAM specification.

4.6 Security and privacy

As the Presence and Availability Management interface is designed to share information across administrative domains and to facilitate availability computation based on the identity of the entity desiring communication, security and privacy issues are addressed in the design. Two of the issues considered to be within the scope of PAM are:

- Access control to an implementation of the PAM specification.
- Use of an authenticated entity's credentials by methods in the specification.

To understand the distinction between the first two issues, consider, for example, an end-user that logs on to an Instant Messaging client and wishes to send a message. The client (or a gateway to which the client talks to) may access a PAM implementation to determine the availability of the destination for the message. The client (or the gateway) will need to be authorized for access to the PAM implementation independent of the user that logs in. A gateway may, in fact, do this access on behalf of a number of clients and, for performance reasons, wish to authenticate itself just once on start up rather than at each invocation. This authentication is handled by the authentication mechanisms in the OSA Framework common to all services within OSA.

Second, each invocation of a particular method will need to contain the credentials of the end-user that logged into the client so that the computation of the availability can take that into account when necessary for privacy issues.

It should be noted that the PAM specification allows for the possibility that the authentication of the end-users is not necessarily done within the PAM implementation itself. As long as the authenticated credentials supplied by the client (or gateway) are acceptable for validation and the client (or the gateway) itself is authenticated by the implementation, the authentication of end-users can occur anywhere outside the PAM implementation. A deployment scenario for a particular application is that one or more authentication services are provided as external services over PAM implementations.

This design does not preclude the possibility that the client (or the gateway) cannot be authenticated. Therefore, the credentials supplied by the client (or the gateway) may be held to stronger authentication criterion than credentials supplied by a trusted client (or gateway).

Finally, the PAM specification does not mandate the use of authentication within an implementation if the environment in which it is used does not require it.

Clause 5.1 explains the mechanism for providing data about the asker to each of the methods with a sequence diagram.

Privacy issues are addressed primarily by providing a mechanism to control the information flowing out of a PAM implementation based on whatever criterion the end user may choose to specify in the availability preferences and independent of any particular application.

The following security issues were considered to be outside the scope of PAM:

- Authentication of the identity of the end-users or entities. As explained above, this authentication may be provided by a third-party authentication service or it may occur through an authentication service written over the PAM platform. The only requirement is that the type of credentials supplied by the authentication service be acceptable to the PAM platform implementation being accessed.
- Encryption of the flow of information between a PAM platform implementation and clients of this implementation. This is dependent on the method of access to the interface which is outside the scope of the PAM specification and hence to be determined by the implementation.

5 Sequence Diagrams

Most of the methods in the PAM interfaces are independently used to query or update presence and availability related information with no transactions or state transitions involved. There are two use cases for which sequence diagrams are useful:

- Acquiring and using authentication tokens.
- Registering for PAM events and getting notifications on the occurrence of the event.

The sequence diagrams for these two cases are provided below. It is assumed that the authentication with the OSA framework has already occurred and the application has access to the PAM interfaces.

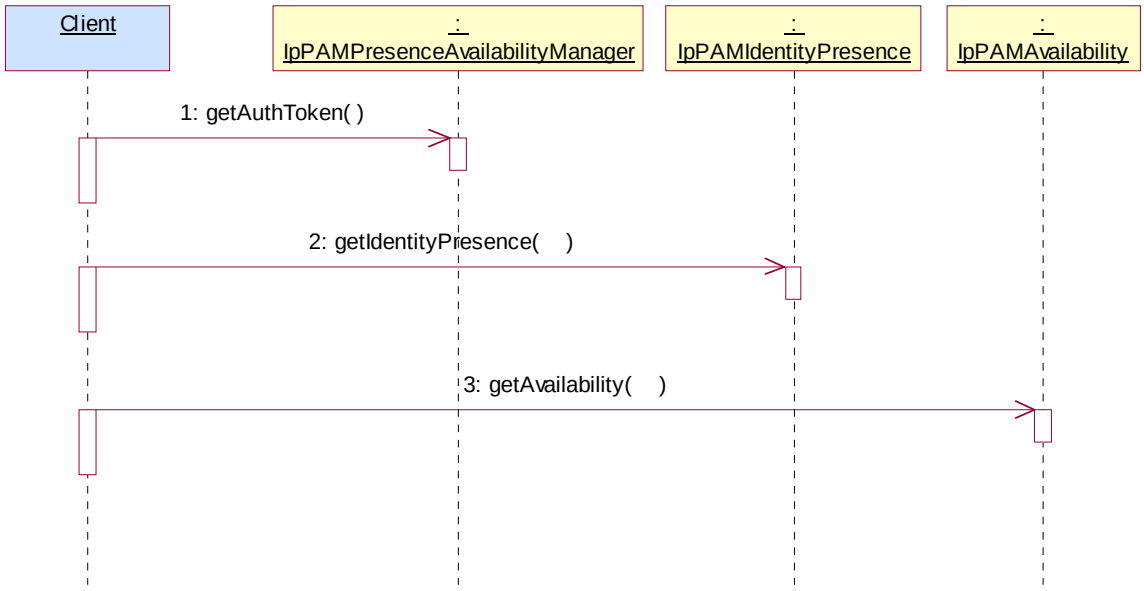
5.1 Use of authentication tokens

As an OSA Service, PAM uses the authentication features of the OSA Framework to provide access control to the PAM interfaces. In addition, PAM provides an optional mechanism for service/application level identification and authentication of the entity requesting the operation or alternatively on whose behalf the operation is being requested. To handle privacy requirements, the results of presence and availability data updates or queries are dependent on the entity requesting the operations.

In the simplest case, the entity authenticating to the OSA Framework to get access to the service interface is the entity requesting the operation. In general, however, a proxy or an application (such as a messaging server or a conferencing server) may authenticate with the OSA Framework once and then check for presence and availability on behalf of multiple client applications (such as instant messaging clients). The credential of these client applications if and when needed by the PAM service can then be provided via the credential parameter in each of the interface methods.

The mechanism to provide the asker data is via the optional parameter of type TpPAMCredential in each of the methods. Supplying the entire asker data in each of the methods is expensive for an implementation since it will need to parse and validate the data supplied in the asker data structure each time. An application may be accessing multiple methods for itself or for the benefit of end user(s) and will need to supply the relevant asker data in each case. To make the consideration of asker data more efficient, the application uses the getAuthToken() method in each of the managers in the SCFs once for each session per asker and gets a credential that can be reused as many times as necessary in the same session to represent the same asker.

The sequence diagram for an example usage is given below.



1: For any unique entity requesting the operation, the authenticated client of the OSA PAM service, requests for an authentication token using the getAuthToken() method in the PresenceAvailability Manager interface.

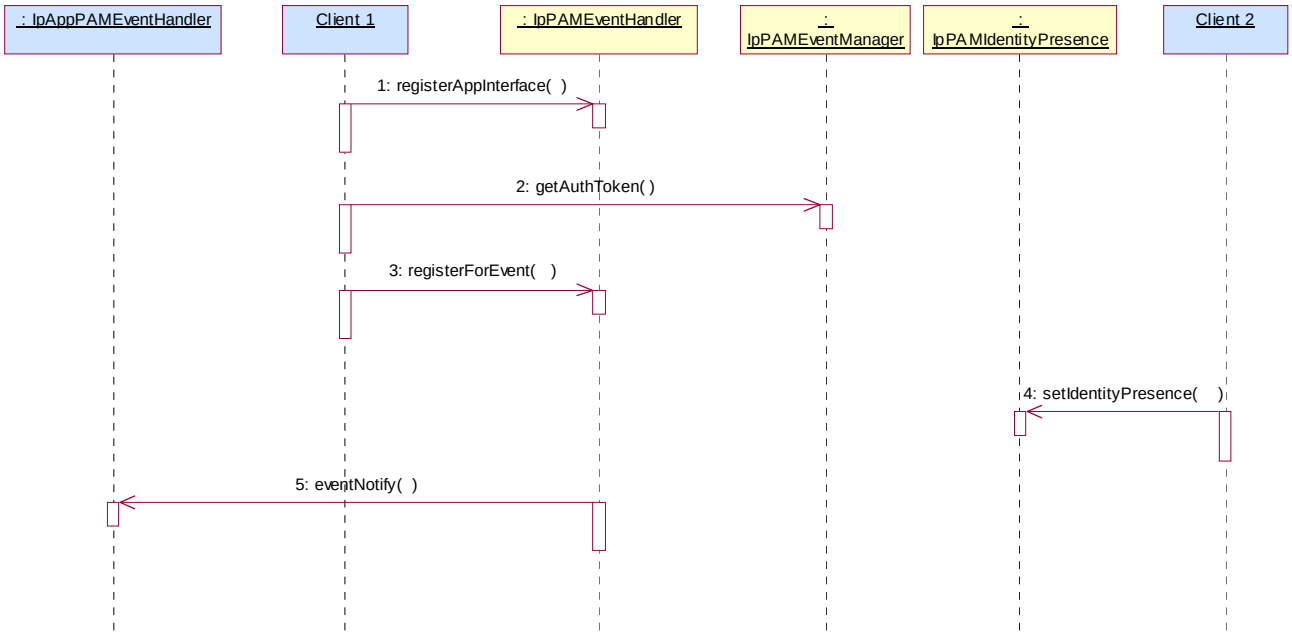
2: The token returned by the getAuthToken() method is used as the credential parameter of the getIdentityPresence() request.

3: The same token is used as the credential parameter of the getAvailability() request(). An authorization token can be used multiple times within the same session established with OSA framework.

5.2 Event registration and notification

An OSA client can register for certain events in the PAM service either for itself or on behalf of its own clients. The client will register one or more application interfaces with the event management service and then activate one or more events for each such registered interface.

The sequence diagram for an example is given below.



1: The client uses the registerAppInterface() method to register its notification interface. The getAuthToken() can be null since the client is doing this registration on its own behalf. The client gets a unique client ID back.

2: The client uses the getAuthToken() to get authentication credentials for its own application client on behalf of whom an event registration is required.

3: The client uses the registerForEvent() method to register for a change in availability event on behalf of its own client. The client gets a unique event ID back.

4: The presence information for an identity of interest in 3 above is changed by another client application acting on its behalf using the setIdentityPresence() method.

5: When the change in presence results in a change in the availability of the identity for the client that has registered for the availability change, a notification is sent out using the previously registered application interface.

6 Class Diagrams

PAM consists of the following SCFs:

- PAM Provisioning Service consisting of Interfaces to provision identities, agents and relationships between them;
- PAM Presence and Availability Service consisting of interfaces to view and update presence and availability information; and
- PAM EventManagement Service consisting of interfaces to subscribe to events in PAM and be notified of such events.

6.1 PAM Provisioning SCF Class Diagrams

PAM Provisioning Service contains the following service interfaces. It contains no application interfaces.

IpPAMIdentityManagement

- The purpose of this interface is to manage subscriber names, aliases, groups and sets of attributes called Profiles associated with subscribers.

IpPAMAgentManagement

- The purpose of this interface is to manage agent (that models a hardware or software device) names, communication capabilities and sets of attributes called Profiles associated with agents.

IpPAMAgentAssignment

- The purpose of this interface is to manage the relationship between identities and the agents assigned to them.

IpPAMIdentityTypeManagement

IpPAMAgentTypeManagement

IpPAMCapabilityManagement

- These three interfaces allow for definitions of identity types, agent types and agent capabilities used for presence and availability management.

The interfaces and the relationships between them are shown in the figure below.

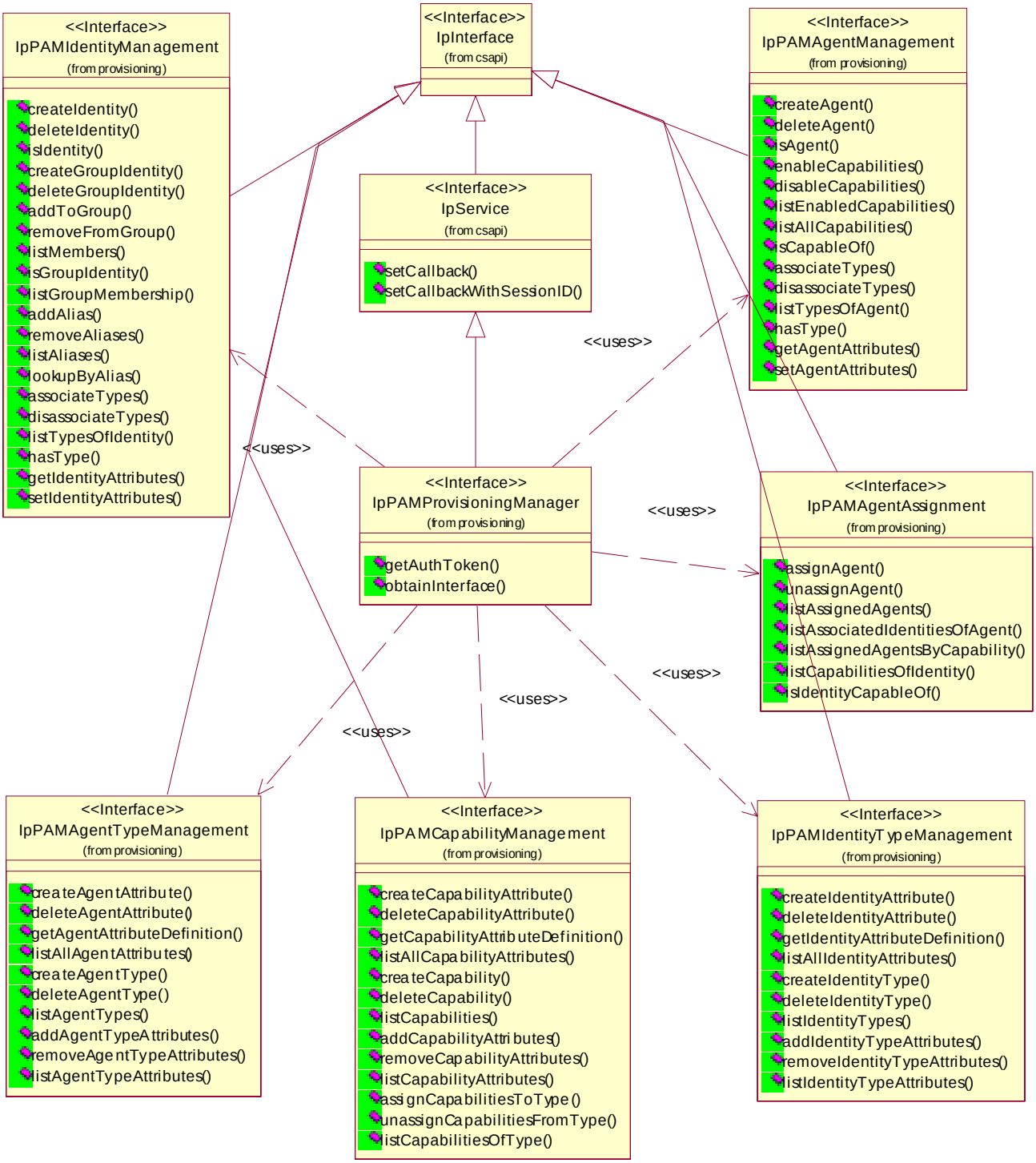


Figure 1: PAM Provisioning Service

6.2 PAM Presence and Availability SCF Class Diagrams

The PAM Presence and Availability service consists of two packages, one for the application interfaces and one for the service interfaces. The application PAM Presence and Availability package consists of 0 or more instances of the IpAppPAMPreferenceCheck interface and the PAM event management service package consists of a single instance of the following interfaces obtainable by applications using the service interface IpPAMPresenceAvailabilityManager.

IpPAMAgentPresence

- The purpose of this interface is to maintain the dynamic presence information of agents.

IpPAMIdentityPresence

- The purpose of this interface is to maintain the dynamic presence information of identities.

IpPAMAvailabilityManagement

- The purpose of this interface is to (i) Manage the preferences specified for the availability of an identity (ii) Query for the availability of identities for specific capabilities.

The interfaces and the relationships between them are shown in the figure below.

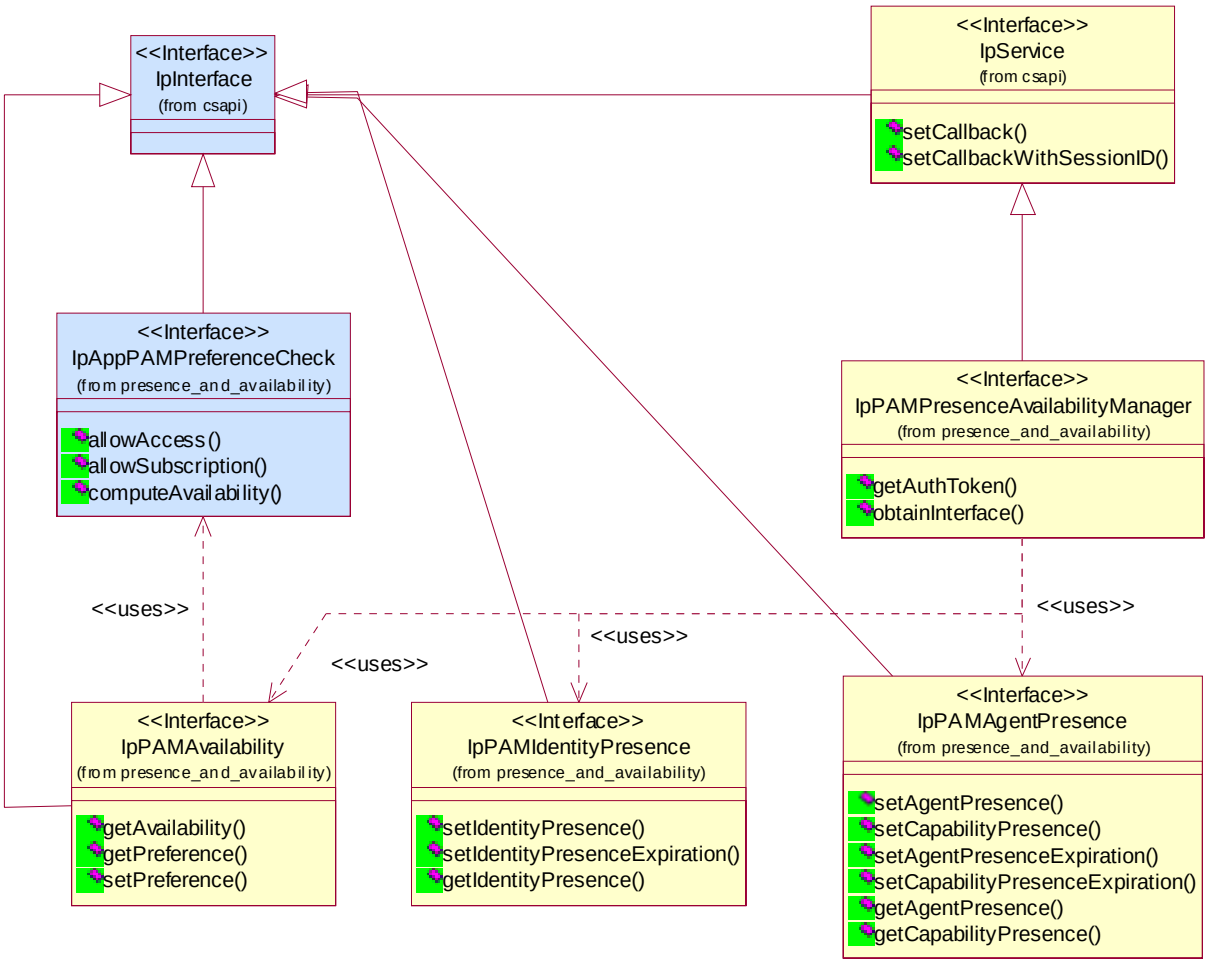


Figure 2: PAM Presence and Availability Service

6.3 PAM Event SCF Class Diagrams

The PAM Event Management service consists of two packages, one for the application interfaces and one for the service interfaces. The application PAM event management package consists of 0 or more instances of the IpAppPAMEventHandler interface and the PAM event management service package consists of a single instance of the IpPAMEventHandler interface. This interface can be obtained by application using the service interface IpPAMEventManager.

The figure below shows the interfaces of PAM Event Management and the relationships between them.

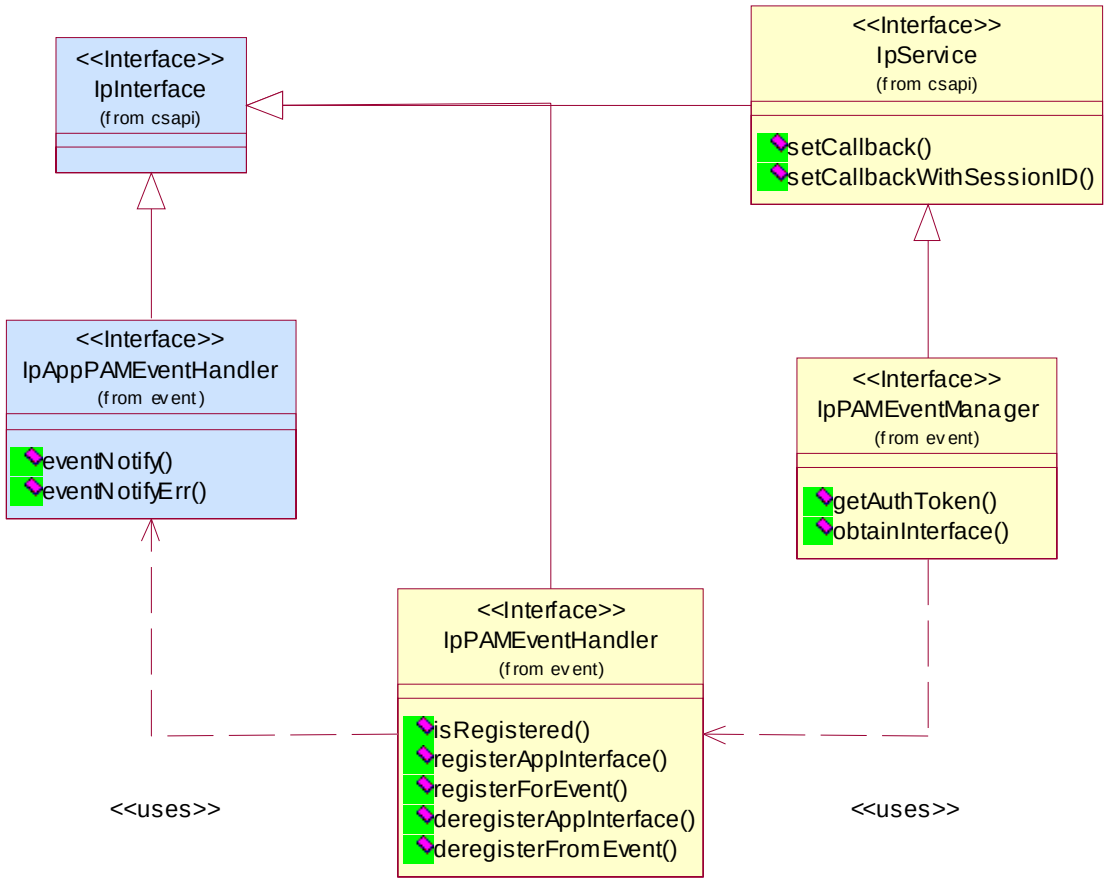


Figure 3: PAM Event Management Service

7 The Service Interface Specifications

7.1 Interface Specification Format

This clause defines the interfaces, methods and parameters that form a part of the API specification. The Unified Modelling Language (UML) is used to specify the interface classes. The general format of an interface specification is described below.

7.1.1 Interface Class

This shows a UML interface class description of the methods supported by that interface, and the relevant parameters and types. The Service and Framework interfaces for enterprise-based client applications are denoted by classes with name `Ip<name>`. The callback interfaces to the applications are denoted by classes with name `IpApp<name>`. For the interfaces between a Service and the Framework, the Service interfaces are typically denoted by classes with name IpSvc<name>, while the Framework interfaces are denoted by classes with name IpFw<name>.

7.1.2 Method descriptions

Each method (API method "call") is described. Both synchronous and asynchronous methods are used in the API. Asynchronous methods are identified by a '`Req`' suffix for a method request, and, if applicable, are served by asynchronous methods identified by either a '`Res`' or '`Err`' suffix for method results and errors, respectively. To handle responses and reports, the application or service developer must implement the relevant `IpApp<name> or IpSvc<name>` interfaces to provide the callback mechanism.

7.1.3 Parameter descriptions

Each method parameter and its possible values are described. Parameters described as 'in' represent those that must have a value when the method is called. Those described as 'out' are those that contain the return result of the method when the method returns.

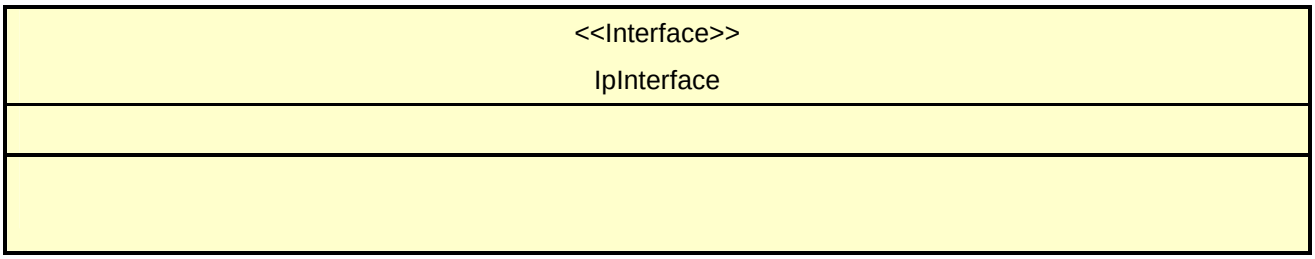
7.1.4 State Model

If relevant, a state model is shown to illustrate the states of the objects that implement the described interface.

7.2 Base Interface

7.2.1 Interface Class IpInterface

All application, framework and service interfaces inherit from the following interface. This API Base Interface does not provide any additional methods.



7.3 Service Interfaces

7.3.1 Overview

The Service Interfaces provide the interfaces into the capabilities of the underlying network - such as call control, user interaction, messaging, mobility and connectivity management.

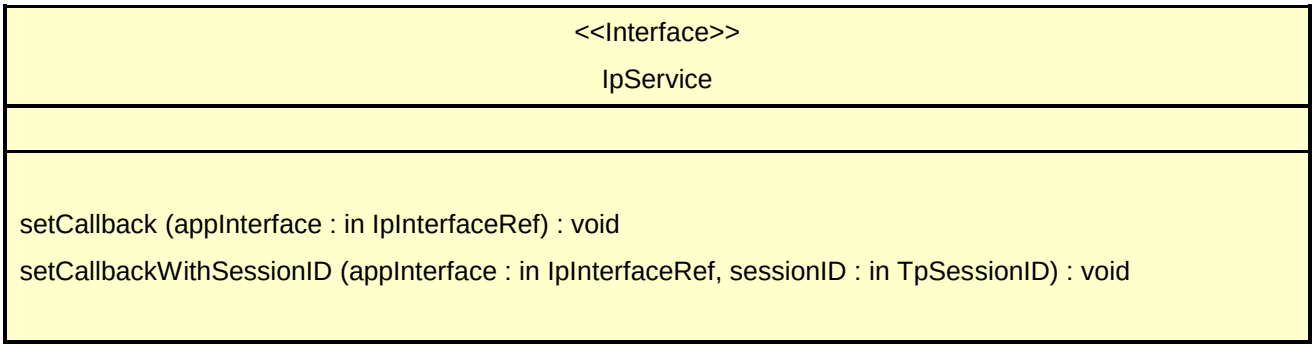
The interfaces that are implemented by the services are denoted as 'Service Interface'. The corresponding interfaces that must be implemented by the application (e.g. for API callbacks) are denoted as 'Application Interface'.

7.4 Generic Service Interface

7.4.1 Interface Class IpService

Inherits from: IpInterface

All service interfaces inherit from the following interface.



7.4.1.1 Method setCallback()

This method specifies the reference address of the callback interface that a service uses to invoke methods on the application. It is not allowed to invoke this method on an interface that uses SessionIDs.

Parameters

appInterface : in IpInterfaceRef

Specifies a reference to the application interface, which is used for callbacks.

Raises

TpCommonExceptions, P_INVALID_INTERFACE_TYPE

7.4.1.2 Method setCallbackWithSessionID()

This method specifies the reference address of the application's callback interface that a service uses for interactions associated with a specific session ID: e.g. a specific call, or call leg. It is not allowed to invoke this method on an interface that does not use SessionIDs.

Parameters

appInterface : in IpInterfaceRef

Specifies a reference to the application interface, which is used for callbacks.

sessionID : in TpSessionID

Specifies the session for which the service can invoke the application's callback interface.

Raises

TpCommonExceptions, P_INVALID_SESSION_ID, P_INVALID_INTERFACE_TYPE

8 Presence and Availability Management Interface Classes

PAM consists of the following SCFs:

- PAM Provisioning Service (not included in the 3GPP release 5 specifications)
- PAM Presence and Availability Service
- PAM Event Service

The provisioning service consists of the Identity Management, Agent Management, Agent Assignment, Agent Type Management, Identity Type Management and Capability Management interfaces. The interfaces in this service are not obtainable for this release of the specifications for 3GPP.

The presence and availability service consists of the agent presence, identity presence and availability interfaces. The agent presence interface is not obtainable in the 3GPP release of the service.

The Event service consists of the Event Management interfaces.

An implementation of this API which supports or implements a method described in the present document, shall support or implement the functionality described for that method, for at least one valid set of values for the parameters of that method. Where a method is not supported by an implementation of a Service interface, the exception P_METHOD_NOT_SUPPORTED shall be returned to any call of that method.

8.1 PAM Provisioning SCF Interface Classes

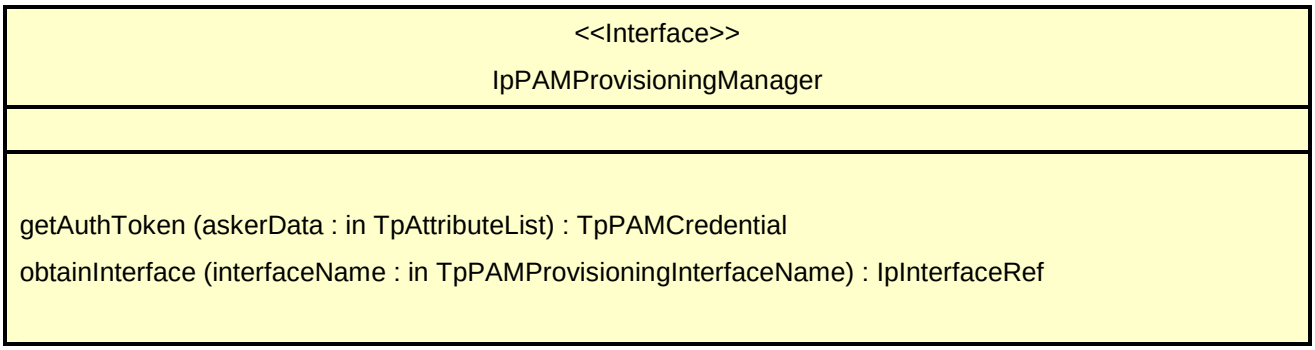
This service consists of interfaces to provision identities, agents and the relationships between them.

8.1.1 Interface Class IpPAMProvisioningManager

Inherits from: IpService

The purpose of this interface is to supply the various interfaces available in this service to the application and to provide the authentication credentials. This interface is the only discoverable interface from the framework.

All PAM methods use an authentication token as a parameter since the outcome of the operations may depend on the entity requesting the operation. To enable this, the getAuthToken() method is used to obtain an implementation dependent token. An application that has authenticated itself with the OSA framework, can get an authentication token for itself. Alternatively, if the application is requesting PAM operations on behalf of multiple entities, authentication tokens may be requested for each such entity after providing any available data about the asker. These tokens can then be used repeatedly for operations within a session without further need to identify the asker.



8.1.1.1 Method getAuthToken()

Get an authentication token for access to the interface methods.

Returns an implementation-dependent authentication credential that can be verified.

Parameters

`askerData : in TpAttributeList`

Specifies information about the asker. Can be an empty array.

Returns

`TpPAMCredential`

Raises

`TpCommonExceptions, P_PAM_INVALID_CREDENTIAL`

8.1.1.2 Method obtainInterface()

Obtain available interfaces from the service. The valid parameters for this method can be obtained from the service property P_OBTAINABLE_INTERFACES.

Returns the requested interface.

Parameters

`interfaceName : in TpPAMProvisioningInterfaceName`

Specifies the name of the required interface.

Returns

`IpInterfaceRef`

Raises

`TpCommonExceptions, P_PAM_UNAVAILABLE_INTERFACE`

8.1.2 Interface Class IpPAMIdentityManagement

Inherits from: IpInterface

The purpose of this interface is to manage end-user or entity names, aliases, groups and sets of attributes associated with identities. An implementation may map these methods to operations on existing directories or databases. Some implementations may choose to provide a read-only access to the identity information.

The names of identities within a namespace must be unique. Each implementation exports an identifier as the default namespace that it serves. The identity name and the namespace may be used as an alias to another identity in a different namespace.

Aliases are associated with a given identity or group identity. Aliases must be uniquely assigned. In other words, two identities may not share the same alias.

This interface is meant for use by provisioning applications that establish and maintain identity names.

<<Interface>>

IpPAMIdentityManagement

createIdentity (identity : in TpPAMFQName, identityTypes : in TpStringList, authToken : in TpPAMCredential) : void

deleteIdentity (identity : in TpPAMFQName, authToken : in TpPAMCredential) : void

isIdentity (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpBoolean

createGroupIdentity (identity : in TpPAMFQName, identityTypes : in TpStringList, authToken : in TpPAMCredential) : void

deleteGroupIdentity (identity : in TpPAMFQName, authToken : in TpPAMCredential) : void

addToGroup (group : in TpPAMFQName, member : in TpPAMFQName, authToken : in TpPAMCredential) : void

removeFromGroup (group : in TpPAMFQName, identity : in TpPAMFQName, authToken : in TpPAMCredential) : void

listMembers (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMFQNameList

isGroupIdentity (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpBoolean

listGroupMembership (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMFQNameList

addAlias (identity : in TpPAMFQName, alias : in TpPAMFQName, authToken : in TpPAMCredential) : void

removeAliases (identity : in TpPAMFQName, alias : in TpPAMFQName, authToken : in TpPAMCredential) : void

listAliases (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMFQNameList

lookupByAlias (alias : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMFQName

associateTypes (identity : in TpPAMFQName, identityTypes : in TpStringList, authToken : in TpPAMCredential) : void

disassociateTypes (identity : in TpPAMFQName, identityTypes : in TpStringList, authToken : in TpPAMCredential) : void

listTypesOfIdentity (identity : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMFQNameList

hasType (identity : in TpPAMFQName, typeName : in TpString, authToken : in TpPAMCredential) : TpBoolean

getIdentityAttributes (identity : in TpPAMFQName, identityType : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : TpPAMAttributeList

setIdentityAttributes (identity : in TpPAMFQName, identityType : in TpString, attributes : in TpPAMAttributeList, authToken : in TpPAMCredential) : void

8.1.2.1 Method createIdentity()

Create a new non-Group Identity with the specified name. Names must be unique across both group identities and non-group identities. Names must be unique across types within a namespace.

Parameters

`identity : in TpPAMFQName`

Specifies the Identity to be created.

identityTypes : in TpStringList

Specifies the identity's associated types. Can be an empty array.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_IDENTITY_EXISTS, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.2.2 Method deleteIdentity()

Delete the specified identity and all its related data. Upon successful completion, associated aliases and attribute instances are deleted from the system. The identity is also removed from all groups of which the identity is a member.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be deleted.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.3 Method isIdentity()

Check if the specified non-group Identity exists. The method returns false for group identities.

Returns true if an identity with the specified name exists and false otherwise.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be checked.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.2.4 Method createGroupIdentity()

Create a new Group Identity with the specified name. Name must be unique across both group identities and non-group identities. Names must be unique across the same types.

Parameters

identity : in TpPAMFQName

Specifies the group Identity to be created.

identityTypes : in TpStringList

Specifies the group's associated types. Can be an empty array.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_IDENTITY_EXISTS, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.2.5 Method deleteGroupIdentity()

Delete the specified group identity and all its related data. Upon successful completion, associated aliases and attribute instances are deleted from the system. The identity is also removed from all groups of which the identity is a member. The member identities of the group are not deleted.

Parameters

identity : in TpPAMFQName

Specifies the group Identity to be deleted.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.6 Method addToGroup()

Add an existing identity to a group identity. Both the group identity and the member identity to be added must have been created before this operation can be invoked. A member identity can be a group identity. Implementation must not allow cycles in memberships.

Parameters

group : in TpPAMFQName

Specifies the group Identity to which the member will be added.

member : in TpPAMFQName

Specifies the identity to be added as a member of the group.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_MEMBER_EXISTS, P_PAM_UNKNOWN_GROUP, P_PAM_UNKNOWN_MEMBER, P_PAM_IS_CYCLIC, P_PAM_INVALID_CREDENTIAL

8.1.2.7 Method removeFromGroup()

Remove an existing identity from the membership of a group identity.

Parameters

group : in TpPAMFQName

Specifies the Group Identity from which the member will be removed.

identity : in TpPAMFQName

Specifies the Identity to be removed as a member of the group.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_NOT_MEMBER, P_PAM_UNKNOWN_GROUP, P_PAM_UNKNOWN_MEMBER, P_PAM_INVALID_CREDENTIAL

8.1.2.8 Method listMembers()

List the members of the specified group Identity.

Returns a list of members of the specified group Identity. An empty list is returned if the identity has no members.

Parameters

identity : in TpPAMFQName

Specifies the group Identity whose members are required.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_GROUP, P_PAM_INVALID_CREDENTIAL

8.1.2.9 Method isGroupIdentity()

Check if the specified group identity exists. The method returns false for non-group identities.

Returns true if a group identity with the specified name exists, false otherwise.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be checked.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.2.10 Method listGroupMembership()

List the Group Identities the specified Identity is a member of.

Returns a list of all groups the specified Identity is member of. An empty list is returned if the identity is not member of any group.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be looked up.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.11 Method addAlias()

Add an alias in the specified namespace to an existing Identity. The alias domain name must be specified in Alias parameter. The identity can be a group identity.

Parameters

identity : in TpPAMFQName

Specifies the Identity to which the alias will be added.

alias : in TpPAMFQName

Specifies the alias to be added.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_ALIAS_EXISTS, P_PAM_ALIAS_NOT_UNIQUE, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.12 Method removeAliases()

Remove the specified alias from an existing identity.

Parameters

identity : in TpPAMFQName

Specifies the Identity from which the alias will be deleted.

alias : in TpPAMFQName

Specifies the alias to be deleted.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNASSIGNED_ALIAS, P_PAM_INVALID_CREDENTIAL

8.1.2.13 Method listAliases()

List the aliases of the specified Identity.

Returns a list containing all aliases to the specified Identity. A list with zero elements is returned if there are no aliases associated with the identity.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be looked up.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.14 Method lookupByAlias()

Find the identity with the specified alias in the specified alias domain.

Returns the identity that has the specified alias. Returns null if the alias is not assigned to any identity.

Parameters

alias : in TpPAMFQName

Specifies the alias to be looked up.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQName

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ALIAS, P_PAM_INVALID_CREDENTIAL

8.1.2.15 Method associateTypes()

Associate an identity instance with the specified types. The identity will be associated with instances of any attributes defined with each type. The initial values of the attributes will be as specified in the definition of the type attributes.

Parameters

identity : in TpPAMFQName

Specifies the name of the identity

identityTypes : in TpStringList

Specifies the names of the type to be associated.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_TYPE_ASSOCIATED, P_PAM_INVALID_CREDENTIAL

8.1.2.16 Method disassociateTypes()

Remove the association of a type with an identity instance. The definition of the type itself remains unaffected and the types may continue to be associated with other identities.

Parameters

identity : in TpPAMFQName

Specifies the identity.

identityTypes : in TpStringList

Specifies the names of the types to be removed.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_DISASSOCIATED_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.2.17 Method listTypesOfIdentity()

List the types associated with the specified Identity.

Returns a list containing all types associated with the specified Identity. A list with zero elements is returned if there are no types associated with the identity.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be looked up.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.18 Method hasType()

Check if the specified identity has the named type associated with it.

Returns true if an identity with the specified name has the named type associated with it, false otherwise.

Parameters

identity : in TpPAMFQName

Specifies the Identity to be checked.

typeName : in TpString

Specifies the type to be checked for.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.2.19 Method getIdentityAttributes()

Return the attributes associated with the identity. If the identity type is not specified, all associated types are assumed to be of interest.

The return value contains the list of specified attributes and their values. If the attributes parameter is an empty array, all attributes in the named identity are output.

Parameters

identity : in TpPAMFQName

Specifies the Identity whose attributes are to be accessed.

identityType : in TpString

Specifies the type of the identity with which the required attributes are associated. Is optional.

attributeNames : in TpStringList

List of attributes of interest. Can be an empty array.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMAttributeList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.2.20 Method setIdentityAttributes()

Modify the attributes associated with the named Identity. The input may contain a subset of the attributes of the named type. Only the specified attributes will be modified and the rest will remain unchanged. If the type is unspecified, any associated type will be assumed

Parameters

identity : in TpPAMFQName

Specifies the Identity.

identityType : in TpString

Specifies the type of the identity for the operation. Is optional.

attributes : in TpPAMAttributeList

Contains the list of attributes and their values.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTES, P_PAM_INVALID_CREDENTIAL

8.1.3 Interface Class IpPAMAgentManagement

Inherits from: IpInterface

The purpose of this interface is to manage agent (that models a hardware or software device) names, communication capabilities and sets of attributes associated with agents. An implementation may map these methods to operations on existing directories or databases. Some implementations may choose to provide a read-only access to the agent information.

Data associated with an agent is captured in attributes associated with types. An implementation may map different type attributes to different underlying stores or directories.

The names of agents within a namespace must be unique.

This interface is meant for use by provisioning applications that establish and maintain agent names.

<<Interface>>

IpPAMAgentManagement

createAgent (agentName : in TpPAMFQName, agentTypes : in TpStringList, authToken : in TpPAMCredential) : void

deleteAgent (agentName : in TpPAMFQName, authToken : in TpPAMCredential) : void

isAgent (agentName : in TpPAMFQName, authToken : in TpPAMCredential) : TpBoolean

enableCapabilities (agentName : in TpPAMFQName, capabilities : in TpPAMCapabilityList, authToken : in TpPAMCredential) : void

disableCapabilities (agentName : in TpPAMFQName, capabilities : in TpPAMCapabilityList, authToken : in TpPAMCredential) : void

listEnabledCapabilities (agentName : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMCapabilityList

listAllCapabilities (agentName : in TpPAMFQName, authToken : in TpPAMCredential) : TpPAMCapabilityList

isCapableOf (agentName : in TpPAMFQName, capability : in TpPAMCapability, authToken : in TpPAMCredential) : TpBoolean

associateTypes (agentName : in TpPAMFQName, agentTypes : in TpStringList, authToken : in TpPAMCredential) : void

disassociateTypes (agentName : in TpPAMFQName, agentTypes : in TpStringList, authToken : in TpPAMCredential) : void

listTypesOfAgent (agentName : in TpPAMFQName, authToken : in TpPAMCredential) : TpStringList

hasType (agentName : in TpPAMFQName, typeName : in TpString, authToken : in TpPAMCredential) : TpBoolean

getAgentAttributes (agentName : in TpPAMFQName, agentType : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : TpPAMAttributeList

setAgentAttributes (agentName : in TpPAMFQName, agentType : in TpString, attributes : in TpPAMAttributeList, authToken : in TpPAMCredential) : void

8.1.3.1 Method createAgent()

Create an agent initialized with the specified capabilities.

Parameters

`agentName : in TpPAMFQName`

Specifies the name of Agent to be created.

`agentTypes : in TpStringList`

Specifies the types of the Agent to be created. Can be an empty list.

`authToken : in TpPAMCredential`

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_AGENT_EXISTS, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.3.2 Method deleteAgent()

Delete the specified Agent and all related data from the system.

Parameters

agentName : in TpPAMFQName

Specifies the name of Agent to be created.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.3 Method isAgent()

Check if the specified agent exists.

Returns true if an agent with the specified name exists, false otherwise.

Parameters

agentName : in TpPAMFQName

Specifies the Agent to be checked.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.3.4 Method enableCapabilities()

Enable the specified capabilities of the agent.

Parameters

agentName : in TpPAMFQName

Specifies the Agent.

capabilities : in TpPAMCapabilityList

Specifies the capabilities to be enabled.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.5 Method disableCapabilities()

Remove the specified capabilities from the Agent.

Parameters

agentName : in TpPAMFQName

Specifies the Agent.

capabilities : in TpPAMCapabilityList

Specifies the communication mode to be disabled.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_NO_CAPABILITY, P_PAM_INVALID_CREDENTIAL

8.1.3.6 Method listEnabledCapabilities()

List the enabled capabilities for the specified Agent.

Returns the list of enabled capabilities for the Agent. Returns an empty list if no enabled capabilities exist for the agent.

Parameters

agentName : in TpPAMFQName

Specifies the Agent whose capabilities are to be listed.

authToken : in TpPAMCredential
Of the entity who wishes to do this operation.

Returns
TpPAMCapabilityList

Raises
TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.7 Method listAllCapabilities()

List the capabilities for the specified Agent.

Returns the list of capabilities for the Agent. Returns an empty list if no capabilities exist for the agent.

Parameters
agentName : in TpPAMFQName
Specifies the Agent whose capabilities are to be listed.

authToken : in TpPAMCredential
Of the entity who wishes to do this operation.

Returns
TpPAMCapabilityList

Raises
TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.8 Method isCapableOf()

Check if an agent has a particular capability that is currently enabled.

Returns true if the agent has the specified capability, false otherwise.

Parameters
agentName : in TpPAMFQName
Specifies the Agent to be checked.

capability : in TpPAMCapability
capability to be checked.

authToken : in TpPAMCredential
Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.9 Method associateTypes()

Associate an agent instance with the specified types.

Parameters

agentName : in TpPAMFQName

Specifies the name of Agent.

agentTypes : in TpStringList

Specifies the types of the Agent to be associated.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_TYPE_ASSOCIATED, P_PAM_INVALID_CREDENTIAL

8.1.3.10 Method disassociateTypes()

Remove the association of a type with an agent instance. The definition of the type itself remains unaffected and the types may continue to be associated with other agents.

Parameters

agentName : in TpPAMFQName

Specifies the agent.

agentTypes : in TpStringList

Specifies the names of the types to be removed.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_DISASSOCIATED_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.3.11 Method listTypesOfAgent()

List the types associated with the specified agent.

Returns the list containing all types associated with the specified agent. An empty list is returned if there are no types associated with the agent.

Parameters

agentName : in TpPAMFQName

Specifies the agent to be looked up.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.12 Method hasType()

Check if the specified agent has the named type associated with it.

Returns true if an agent with the specified name has the named type associated with it.

Parameters

agentName : in TpPAMFQName

Specifies the Agent to be checked.

typeName : in TpString

Specifies the type to be checked for.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.3.13 Method getAgentAttributes()

Return the attributes associated with the agent. If the type is not specified, all associated types are assumed.

Return value contains the list of specified attributes and their values. If the attributes parameter is an empty list, all attributes in the named agent are returned.

Parameters

agentName : in TpPAMFQName

Specifies the agent.

agentType : in TpString

Specifies the type of interest. Is optional.

attributeNames : in TpStringList

List of attributes of interest. Can be an empty list.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMAttributeList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.3.14 Method setAgentAttributes()

Modify the attributes associated with the named agent. The input may contain a subset of the attributes of the named type. Only the specified attributes will be modified and the rest will remain unchanged.

Parameters

agentName : in TpPAMFQName

Specifies the agent.

agentType : in TpString

Specifies the type of interest. Is optional.

attributes : in TpPAMAttributeList

contains the list of attributes and their values.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTES, P_PAM_INVALID_CREDENTIAL

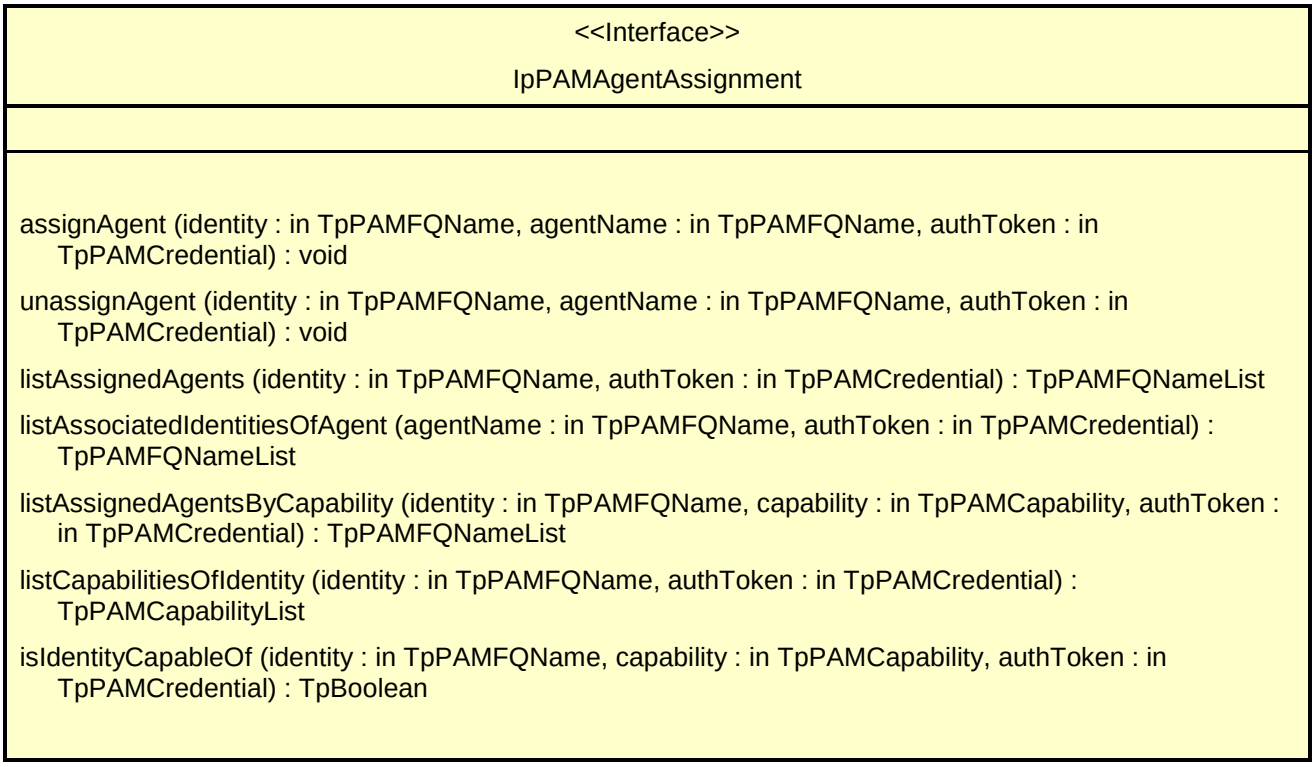
8.1.4 Interface Class IpPAMAgentAssignment

Inherits from: IpInterface

The purpose of this interface is to manage the relationship between identities and the agents assigned to them. The identities inherit capabilities from the assignments of agents.

The implementation must maintain the integrity of the relationship between identities and agents across changes to both identities and agents. Implementations may map these methods to operations on existing directories and databases. Some implementations may provide a read-only access to this interface.

This interface is meant for use by provisioning applications that establish and maintain association of agents with identities.



8.1.4.1 Method assignAgent()

Assign an existing agent to an existing identity.

Parameters

`identity : in TpPAMFQName`

Specifies the identity to assign the agent to.

`agentName : in TpPAMFQName`

Specifies the Agent.

`authToken : in TpPAMCredential`

Of the entity who wishes to do this operation.

Raises

`TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL`

8.1.4.2 Method unassignAgent()

Unassign an agent from an existing identity. In effect, this deletes an existing relationship between an agent and an identity.

Parameters

identity : in TpPAMFQName

Specifies the identity to assign the agent to.

agentName : in TpPAMFQName

Specifies the Agent.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_ASSIGNMENT, P_PAM_INVALID_CREDENTIAL

8.1.4.3 Method listAssignedAgents()

List the Agents assigned to an identity.

Returns the list of agent names assigned to the identity. An empty list is returned if no agents are assigned to the identity.

Parameters

identity : in TpPAMFQName

Specifies the identity of interest.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.4.4 Method listAssociatedIdentitiesOfAgent()

List the identities that have the specified agent assigned to them.

Returns the list of identities that have been assigned the specified agent. Empty list is returned if no identities have been assigned this agent.

Parameters

agentName : in TpPAMFQName

Specifies the Agent.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_INVALID_CREDENTIAL

8.1.4.5 Method listAssignedAgentsByCapability()

List the Agents assigned to an identity that match the specified capability.

Returns the list of agent names with the specified capability. An empty list is returned no agents are found.

Parameters

identity : in TpPAMFQName

Specifies the identity of interest.

capability : in TpPAMCapability

Specifies the capability of interest.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMFQNameList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.4.6 Method listCapabilitiesOfIdentity()

List the capabilities of an identity that it derives from its assigned Agents.

Returns the list of the identity's capabilities. Returns an empty list if no capabilities exist.

Parameters

identity : in TpPAMFQName

Specifies the identity of interest.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMCapabilityList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.4.7 Method isIdentityCapableOf()

Check if an identity has the specified capability derived from one or more agents assigned to it.

Returns true if the identity has this capability, false otherwise.

Parameters

identity : in TpPAMFQName

Specifies the identity of interest.

capability : in TpPAMCapability

identifies the capability to check for.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.1.5 Interface Class IpPAMIdentityTypeManagement

Inherits from: IpInterface

This clause describes the programmatic interface to define the type schema for identities specifying the attributes associated with the type. These types can then be assigned to identities. PAM implementations may provide a set of pre-defined types. Identity type names and agent type names are in the same namespace and hence must be uniquely defined across both identities and agents. The attributes for identity types and agent types are in two different namespaces and hence an attribute name may be re-used with different characteristics for identities and agents.

<<Interface>> IpPAMIdentityTypeManagement
createIdentityAttribute (pAttribute : in TpPAMAttributeDef, authToken : in TpPAMCredential) : void deleteIdentityAttribute (attributeName : in TpString, authToken : in TpPAMCredential) : void getIdentityAttributeDefinition (attributeName : in TpString, authToken : in TpPAMCredential) : TpPAMAttributeDef listAllIdentityAttributes (authToken : in TpPAMCredential) : TpStringList createIdentityType (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void deleteIdentityType (typeName : in TpString, authToken : in TpPAMCredential) : void listIdentityTypes (authToken : in TpPAMCredential) : TpStringList addIdentityTypeAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void removeIdentityTypeAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void listIdentityTypeAttributes (typeName : in TpString, authToken : in TpPAMCredential) : TpStringList

8.1.5.1 Method createIdentityAttribute()

Create a definition of an identity attribute to specify its name and type.

Parameters

pAttribute : in TpPAMAttributeDef

Specifies the attribute to be created.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_ATTRIBUTE_EXISTS, P_PAM_INVALID_CREDENTIAL

8.1.5.2 Method deleteIdentityAttribute()

Delete the definition of an identity attribute.

Parameters

attributeName : in TpString

Specifies the attribute to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.5.3 Method getIdentityAttributeDefinition()

Get the definition for the specified identity attribute.

Returns the definition of the specified attribute.

Parameters

attributeName : in TpString

Specifies the attribute.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpPAMAttributeDef

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.5.4 Method listAllIdentityAttributes()

List all known identity attributes.

Returns the list of attribute names defined so far. An empty array if no attributes have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.5.5 Method createIdentityType()

Specify a label as the name of an identity type.

Parameters

typeName : in TpString

Specifies the name of the type to be created.

attributeNames : in TpStringList

Specifies the list of attributes to be added.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_TYPE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.5.6 Method deleteIdentityType()

Delete a label as the name of an identity type. All identities that have this type are no longer associated with this type and consequently will no longer will have any attributes associated with this type.

Parameters

typeName : in TpString

Specifies the name of the type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.5.7 Method listIdentityTypes()

List all known identity types.

Returns the list of known identity types. An empty array if no identity types have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.5.8 Method addIdentityTypeAttributes()

Add attribute definitions to the schema of an identity type that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

List of attributes to be added to this type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_ATTRIBUTE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.5.9 Method removeIdentityTypeAttributes()

Delete attribute definitions from the schema of an identity type that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

Specifies the list of attributes to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.5.10 Method listIdentityTypeAttributes()

List all attributes of an identity type.

Returns the list of attribute definitions for the named type. An empty array if no attributes have been defined for this type.

Parameters

typeName : in TpString

Specifies the name of the type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.6 Interface Class IpPAMAgentTypeManagement

Inherits from: IpInterface

This clause describes the programmatic interface to define the type schema for agents specifying the attributes associated with the type. These types can then be assigned to agents. PAM implementations may provide a set of pre-defined types. Identity type names and agent type names are in the same namespace and hence must be uniquely defined across both identities and agents. The attributes for identity types and agent types are in two different namespaces and hence an attribute name may be re-used with different characteristics for identities and agents.

<<Interface>>

IpPAMAgentTypeManagement

createAgentAttribute (pAttribute : in TpPAMAttributeDef, authToken : in TpPAMCredential) : void

deleteAgentAttribute (attributeName : in TpString, authToken : in TpPAMCredential) : void

getAgentAttributeDefinition (attributeName : in TpString, authToken : in TpPAMCredential) : TpPAMAttributeDef

listAllAgentAttributes (authToken : in TpPAMCredential) : TpStringList

createAgentType (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

deleteAgentType (typeName : in TpString, authToken : in TpPAMCredential) : void

listAgentTypes (authToken : in TpPAMCredential) : TpStringList

addAgentTypeAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

removeAgentTypeAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

listAgentTypeAttributes (typeName : in TpString, authToken : in TpPAMCredential) : TpStringList

8.1.6.1 Method createAgentAttribute()

Create a definition of an Agent attribute to specify its name and type.

Parameters

pAttribute : in TpPAMAttributeDef

Specifies the attribute to be created.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_ATTRIBUTE_EXISTS, P_PAM_INVALID_CREDENTIAL

8.1.6.2 Method deleteAgentAttribute()

Delete the definition of an Agent attribute.

Parameters

attributeName : in TpString

Specifies the attribute to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.6.3 Method getAgentAttributeDefinition()

Get the definition for the specified Agent attribute.

Returns the definition of the specified attribute.

Parameters

attributeName : in TpString

Specifies the attribute.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpPAMAttributeDef

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.6.4 Method listAllAgentAttributes()

List all known Agent attributes.

Returns the list of attribute names defined so far. An empty array if no attributes have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.6.5 Method createAgentType()

Specify a label as the name of an Agent type.

Parameters

typeName : in TpString

Specifies the name of the type to be created.

attributeNames : in TpStringList

Specifies the list of attributes to be added.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_TYPE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.6.6 Method deleteAgentType()

Delete a label as the name of an Agent type. All identities that have this type are no longer associated with this type and consequently will no longer will have any attributes associated with this type.

Parameters

typeName : in TpString

Specifies the name of the type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.6.7 Method listAgentTypes()

List all known Agent types.

Returns the list of known Agent types. An empty array if no Agent types have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.6.8 Method addAgentTypeAttributes()

Add attribute definitions to the schema of an Agent type that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

List of attributes to be added to this type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_ATTRIBUTE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.6.9 Method removeAgentTypeAttributes()

Delete attribute definitions from the schema of an Agent type that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

Specifies the list of attributes to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.6.10 Method listAgentTypeAttributes()

List all attributes of an Agent type.

Returns the list of attributes for the named type. An empty array if no attributes have been defined for this type.

Parameters

`typeName : in TpString`

Specifies the name of the type.

`authToken : in TpPAMCredential`

Credential of the entity who wishes to do this operation.

Returns

`TpStringList`

Raises

`TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL`

8.1.7 Interface Class IpPAMCapabilityManagement

Inherits from: IpInterface

This clause describes the programmatic interface to define capability names.

Capabilities are names that define a property of an agent for which presence data may exist. Examples are voice, IM, SMS, WAP, etc. Agents can be assigned capabilities. Identities inherit capabilities from agents but cannot be directly assigned capabilities. Each capability is defined with an associated set of attributes. The attributes for each capability exist in their own namespace and hence an attribute name may be re-used with different characteristics across capabilities.

<<Interface>>

IpPAMCapabilityManagement

createCapabilityAttribute (pAttribute : in TpPAMAttributeDef, authToken : in TpPAMCredential) : void

deleteCapabilityAttribute (attributeName : in TpString, authToken : in TpPAMCredential) : void

getCapabilityAttributeDefinition (attributeName : in TpString, authToken : in TpPAMCredential) : TpPAMAttributeDef

listAllCapabilityAttributes (authToken : in TpPAMCredential) : TpStringList

createCapability (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

deleteCapability (typeName : in TpString, authToken : in TpPAMCredential) : void

listCapabilities (authToken : in TpPAMCredential) : TpStringList

addCapabilityAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

removeCapabilityAttributes (typeName : in TpString, attributeNames : in TpStringList, authToken : in TpPAMCredential) : void

listCapabilityAttributes (typeName : in TpString, authToken : in TpPAMCredential) : TpStringList

assignCapabilitiesToType (agentType : in TpString, capabilities : in TpPAMCapabilityList, authToken : in TpPAMCredential) : void

unassignCapabilitiesFromType (agentType : in TpString, capabilities : in TpPAMCapabilityList, authToken : in TpPAMCredential) : void

listCapabilitiesOfType (agentType : in TpString, authToken : in TpPAMCredential) : TpPAMCapabilityList

8.1.7.1 Method createCapabilityAttribute()

Create a definition of a Capability attribute to specify its name and type.

Parameters

pAttribute : in TpPAMAttributeDef

Specifies the attribute to be created.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_ATTRIBUTE_EXISTS, P_PAM_INVALID_CREDENTIAL

8.1.7.2 Method deleteCapabilityAttribute()

Delete the definition of a Capability attribute.

Parameters

attributeName : in TpString

Specifies the attribute to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.7.3 Method getCapabilityAttributeDefinition()

Get the definition for the specified Capability attribute.

Returns the definition of the specified attribute.

Parameters

attributeName : in TpString

Specifies the attribute.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpPAMAttributeDef

Raises

TpCommonExceptions, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.7.4 Method listAllCapabilityAttributes()

List all known Capability attributes.

Returns the list of attribute names defined so far. An empty array if no attributes have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.7.5 Method createCapability()

Specify a label as the name of a Capability type.

Parameters

typeName : in TpString

Specifies the name of the type to be created.

attributeNames : in TpStringList

Specifies the list of attributes to be added.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_TYPE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.7.6 Method deleteCapability()

Delete a label as the name of a Capability. All agents that have this type are no longer associated with this type and consequently will no longer will have any attributes associated with this type.

Parameters

typeName : in TpString

Specifies the name of the type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.7.7 Method listCapabilities()

List all known Capability types.

Returns the list of known Capability types. An empty array if no Capability types have been defined.

Parameters

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.1.7.8 Method addCapabilityAttributes()

Add attribute definitions to the schema of a capability that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

List of attributes to be added to this type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_ATTRIBUTE_EXISTS, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.7.9 Method removeCapabilityAttributes()

Delete attribute definitions from the schema of a Capability that has already been defined.

Parameters

typeName : in TpString

Specifies the name of the type.

attributeNames : in TpStringList

Specifies the list of attributes to be deleted.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.1.7.10 Method listCapabilityAttributes()

List all attributes of a capability.

Returns the list of attributes for the named Capability. An empty array if no attributes have been defined for this capability.

Parameters

typeName : in TpString

Specifies the name of the type.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpStringList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.1.7.11 Method assignCapabilitiesToType()

Assign capabilities to agent type.

Parameters

agentType : in TpString

Name of an agent type.

capabilities : in TpPAMCapabilityList

Specifies the list of capabilities to be associated.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_CAPABILITY, P_PAM_INVALID_CREDENTIAL

8.1.7.12 Method unassignCapabilitiesFromType()

Unassign capabilities from an agent type.

Parameters

agentType : in TpString

Name of an agent type.

capabilities : in TpPAMCapabilityList

Specifies the list of capabilities to be disassociated.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_CAPABILITY, P_PAM_INVALID_CREDENTIAL

8.1.7.13 Method listCapabilitiesOfType()

List capabilities assigned to an agent type.

Returns the list of capabilities assigned to the agent type.

Parameters

agentType : in TpString

Name of an agent type.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMCapabilityList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_TYPE, P_PAM_INVALID_CREDENTIAL

8.2 PAM Presence and Availability SCF Interface Classes

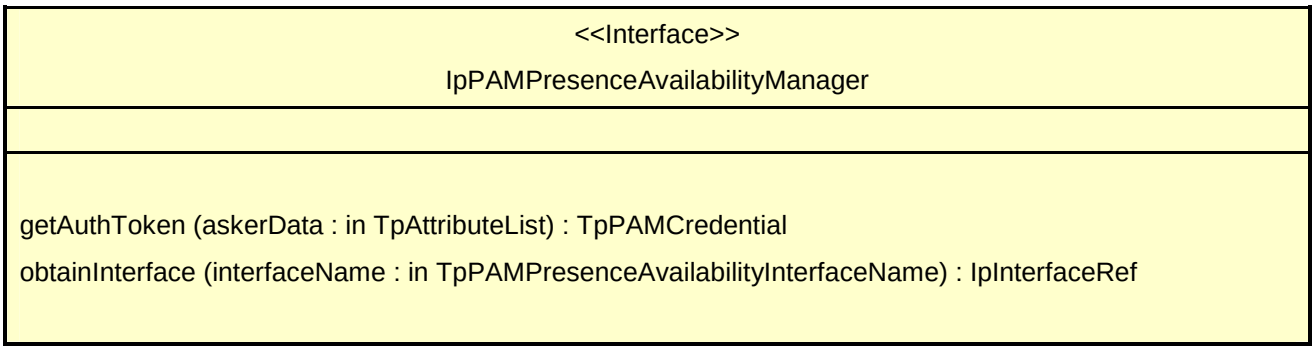
This service consists of the presence and availability query and update interfaces.

8.2.1 Interface Class IpPAMPresenceAvailabilityManager

Inherits from: IpService

The purpose of this interface is to supply the various interfaces available in this service to the application and to provide the authentication credentials. This interface is the only discoverable interface from the framework.

All PAM methods optionally use an authentication token as a parameter since the outcome of the operations may depend on the entity requesting the operation. To enable this, the getAuthToken() method is used to obtain an implementation dependent token. An application that has authenticated itself with the OSA framework, can get an authentication token for itself. Alternatively, if the application is requesting PAM operations on behalf of multiple entities, authentication tokens may be requested for each such entity after providing any available data about the asker. These tokens can then be used repeatedly for operations within a session without further need to identify the asker.



8.2.1.1 Method getAuthToken()

Get an authentication token for access to the interface methods.

Returns an implementation-dependent authentication credential that can be verified.

Parameters

askerData : in TpAttributeList

Specifies information about the asker. Can be an empty array.

Returns

TpPAMCredential

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.2.1.2 Method obtainInterface()

Obtain available interfaces from the service. The valid parameters for this method can be obtained from the service property P_OBTAINABLE_INTERFACES.

Returns the requested interface.

Parameters

interfaceName : in TpPAMPresenceAvailabilityInterfaceName

Specifies the name of the required interface.

Returns

IpInterfaceRef

Raises

TpCommonExceptions, P_PAM_UNAVAILABLE_INTERFACE

8.2.2 Interface Class IpPAMIdentityPresence

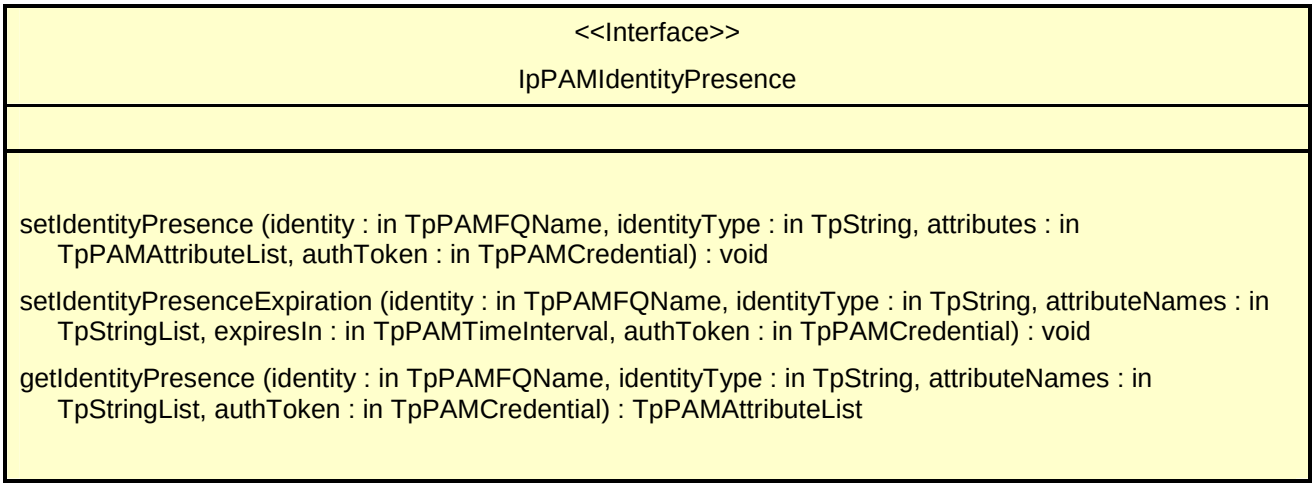
Inherits from: IpInterface

The purpose of this interface is to maintain the dynamic presence information of identity.

The underlying implementations may optimize the storage for this dynamic data rather than rely on a general-purpose directory or database when performance is an issue. Presence information for identities may be explicitly registered are may be implicitly derived from the underlying networks or presence information from agents associated with the identity.

This interface is meant for use by applications that register and/or maintain dynamic presence information associated with identities and accessible without the privacy or other controls established by availability preferences. These applications may not be aware of the name and the types of agents associated with the identity.

The presence information can be explicitly registered using the interface or the presence may come from information implicitly derived (e.g., using presence information of agents associated with the identity).



8.2.2.1 Method setIdentityPresence()

Set identity's dynamic attributes.

Parameters

identity : in TpPAMFQName

Specifies the identity.

identityType : in TpString

Specifies the type of the identity.

attributes : in TpPAMAttributeList

Specifies the attributes to set.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.2.2 Method setIdentityPresenceExpiration()

Set or reset the expiration of an identity's named presence attributes. If the attributeNames parameter is an empty list, the expiration time of all attributes defined for the identity will have their expiration time changed.

Parameters

identity : in TpPAMFQName

Specifies the identity.

identityType : in TpString

Specifies the type of the identity.

attributeNames : in TpStringList

Specifies the names of the attributes. Can be an empty list.

expiresIn : in TpPAMTimeInterval

Specifies the number of seconds until the attributes expire. A value of -1 indicates no expiration.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.2.3 Method getIdentityPresence()

Retrieve presence attributes associated with an identity.

Return value contains the requested attributes of the named capability. If the attributes parameter is an empty array, all attributes of the named profile are included.

Parameters

identity : in TpPAMFQName

Specifies the identity.

identityType : in TpString

Specifies the type of the identity.

attributeNames : in TpStringList

Specifies the attributes of interest. Can be an empty list.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMAttributeList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.3 Interface Class IpPAMAvailability

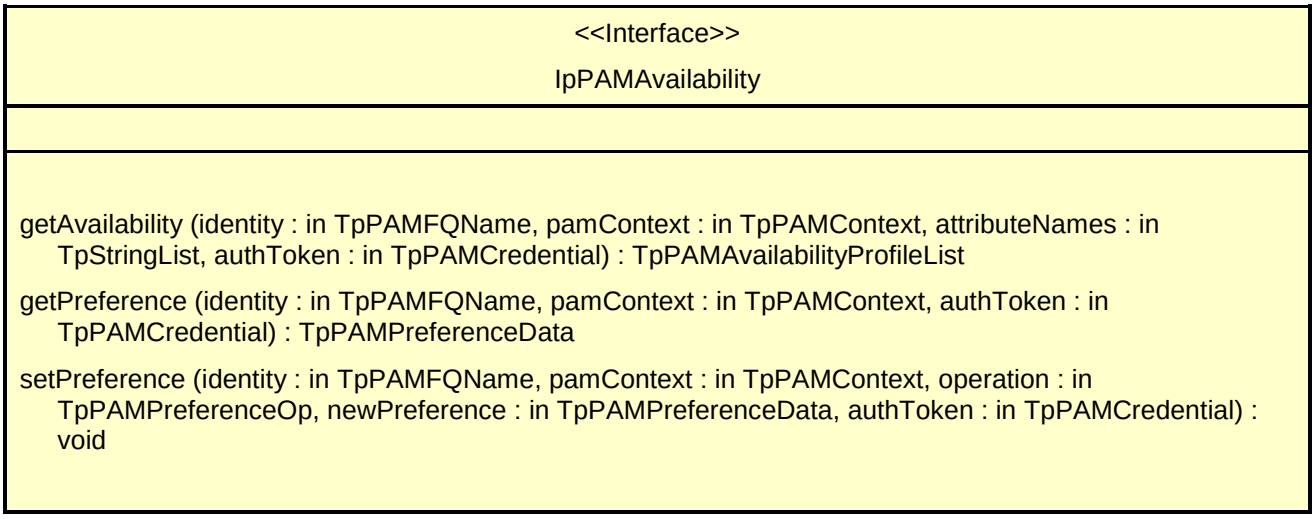
Inherits from: IpInterface

The purpose of the interface is to
- Manage the preferences specified for the availability of an identity and, to
- Query for the availability of identities for specific capabilities.
- Query for attributes of interest from an identity.

Simple implementations may equate the availability of identities to presence of their agents with available status. More complex implementations may consider, in addition, the preferences specified for availability as well as the attributes of the entity asking for availability.

The queries for availability are done for a specified context. A context is a set of attributes describing the situation for which availability is requested. PAM specifies one pre-defined context - Communication. The Communication context is used for availability for a specific mode of communication. Applications and PAM implementations may extend and provide additional contexts such as availability at a particular location, availability for a specific mode of communication at a given location, etc. The context information also includes any information about the asker as may be provided by the asker.

The specification defines two types of preference mechanisms although implementations may support additional mechanisms. The first mechanism consists of access control lists that specify identities that are allowed/denied to access information about the identity whose preference is being set. The second mechanism allow for an external application interface to be specified to check for access control as well as to compute availability.



8.2.3.1 Method getAvailability()

Get the availability for an identity for a given context.

All contexts may optionally include an asker profile. Although PAM applications may decide what attributes to include in an asker profile, PAM implementations should not require such attributes to be present. The implementations should leave it to the availability computations to decide the availability based on the (partial) information provided.

It is also up to the availability computation to decide on the trustworthiness of the asker profile information based on the application, the credentials of the entity asking for availability and/or the credentials, if any, of the entity accessing the interface.

Returns a value containing a list of attributes as available to the asker in the requested context. If no information is available to the asker an empty list is returned.

Parameters

`identity : in TpPAMFQName`

Specifies the identity for which the availability is being requested.

`pamContext : in TpPAMContext`

Specifies the context for which the availability is requested.

`attributeNames : in TpStringList`

Specifies the attributes of interest. Can be an empty list to indicate all attributes.

`authToken : in TpPAMCredential`

Of the entity who wishes to do this operation.

Returns

`TpPAMAvailabilityProfileList`

Raises

`TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL`

8.2.3.2 Method getPreference()

Get the availability preferences of an identity for the specified communication mode.

This method should be used in conjunction with the setPreference method.

Returns the preference for the named context if previously specified for the identity. Is null if there are no preferences associated.

Parameters

`identity : in TpPAMFQName`

Specifies the identity of interest.

`pamContext : in TpPAMContext`

Specifies the context for which the preferences are requested.

`authToken : in TpPAMCredential`

Of the entity who wishes to do this operation.

Returns

TpPAMPreferenceData

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.2.3.3 Method setPreference()

Set the availability preferences for the specified identity for the specified context. If the identity is Null, the preference is set for all identities (if authorized to do so).

The existing preference will be modified based on the operation.

If the new preference is specified as Null for replace operation , any existing preferences for the specified context will be removed.

Parameters

identity : in TpPAMFQName

Specifies the identity with which the preference will be associated.

pamContext : in TpPAMContext

Specifies the capability to which this preference applies.

operation : in TpPAMPreferenceOp

Specifies the operation to be performed with the specified preference.

newPreference : in TpPAMPreferenceData

Specifies the availability preference to add.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_IDENTITY, P_PAM_INVALID_CREDENTIAL

8.2.4 Interface Class IpPAMAgentPresence

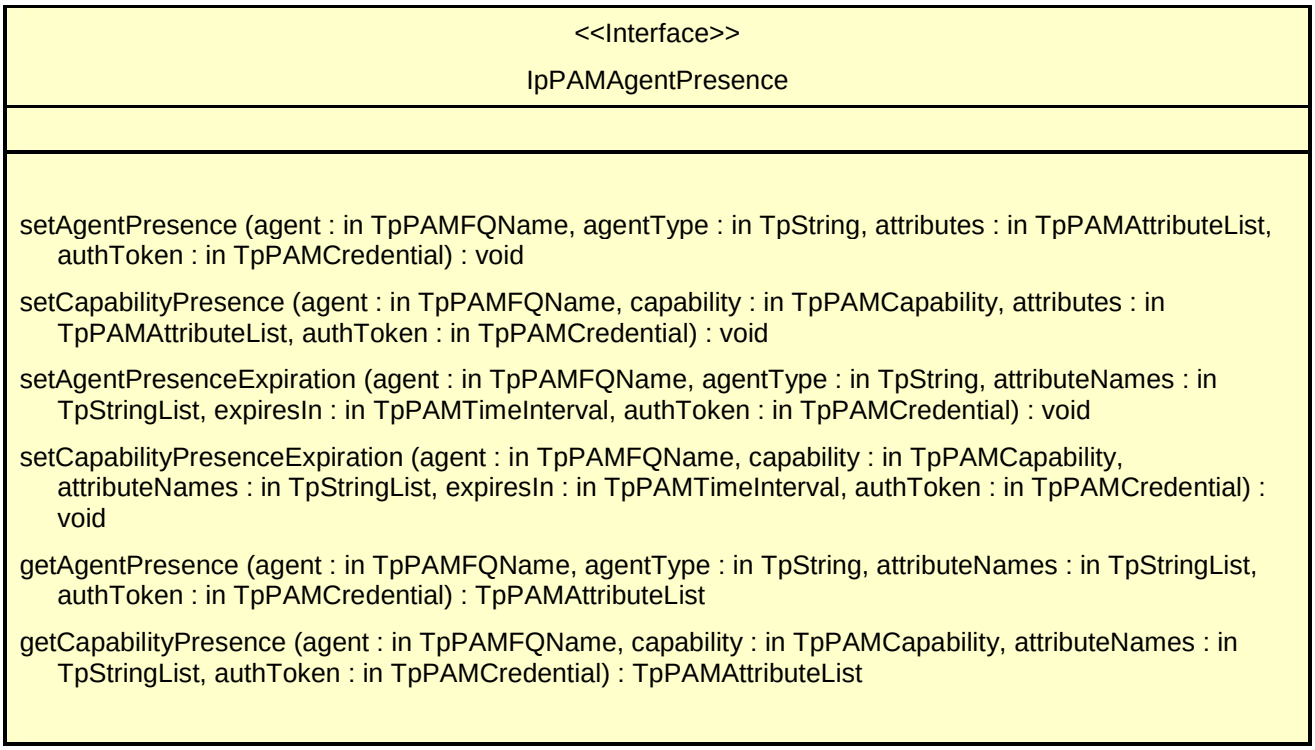
Inherits from: IpInterface

The purpose of this interface is to maintain the dynamic presence information of agents.

The underlying implementations may optimize the storage for this dynamic data rather than rely on a general-purpose directory or database when performance is an issue. Agents may explicitly register the presence information or the presence information may be implicitly derived from the underlying networks.

The presence information is modelled through dynamic attributes. Sets of dynamic attributes can be defined per agent type (e.g., agent location, power status) or per agent capability (e.g., agent status for voice/messaging, communication address).

This interface is meant for use by applications that query and update agent presence information directly regardless of the identities to which the agent is assigned.



8.2.4.1 Method setAgentPresence()

Set presence attribute values for an agent.

Parameters

agent : in TpPAMFQName

Specifies the agent.

agentType : in TpString

Specifies the type of the agent.

attributes : in TpPAMAttributeList

Specifies the dynamic attributes to set.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.4.2 Method setCapabilityPresence()

Set presence attribute values for a set of capabilities of an agent.

Parameters

agent : in TpPAMFQName

Specifies the agent.

capability : in TpPAMCapability

Specifies which capability of the agent to set.

attributes : in TpPAMAttributeList

Specifies the dynamic attributes to set.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_CAPABILITY, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.4.3 Method setAgentPresenceExpiration()

Set or reset the expiration of an agent's named presence profile.

Parameters

agent : in TpPAMFQName

Specifies the agent.

agentType : in TpString

Specifies the type of the agent.

attributeNames : in TpStringList

Specifies the names of the dynamic attributes. May be an empty array to indicate all dynamic attributes are to be affected.

expiresIn : in TpPAMTimeInterval

Specifies the number of seconds until the attributes expire. A value of -1 indicates no expiration. A value of 0 indicates immediate expiration.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.4.4 Method setCapabilityPresenceExpiration()

Set or reset the expiration of named presence attributes for a set of capabilities of an agent.

Parameters

agent : in TpPAMFQName

Specifies the agent.

capability : in TpPAMCapability

Specifies the type of the agent.

attributeNames : in TpStringList

Specifies the names of the dynamic attributes. May be an empty array to indicate all dynamic attributes are to be affected.

expiresIn : in TpPAMTimeInterval

Specifies the number of seconds until the attributes expire. A value of -1 indicates no expiration. A value of 0 indicates immediate expiration.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_NO_CAPABILITY, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.4.5 Method getAgentPresence()

Retrieve named presence attributes for an agent.

Return value contains the requested dynamic attributes associated with the specified agent. If the attributeNames parameter is an empty list, all dynamic attributes of the specified agent are included.

Parameters

agent : in TpPAMFQName

Specifies the agent.

agentType : in TpString

Specifies the type of the agent.

attributeNames : in TpStringList

Specifies the dynamic attributes of interest. Can be an empty array to indicate all dynamic attributes are to be retrieved.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMAttributeList

Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_TYPE, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.4.6 Method getCapabilityPresence()

Retrieve named presence attributes for a capability of an agent.

Return value contains the requested dynamic attributes associated with the specified agent. If the attributeNames parameter is an empty list, all dynamic attributes of the specified agent are included.

Parameters

agent : in TpPAMFQName

Specifies the agent.

capability : in TpPAMCapability

Specifies which capability of the agent for which attributes are desired.

attributeNames : in TpStringList

Specifies the dynamic attributes of interest. Can be an empty array to indicate all dynamic attributes are to be retrieved.

authToken : in TpPAMCredential

Of the entity who wishes to do this operation.

Returns

TpPAMAttributeList

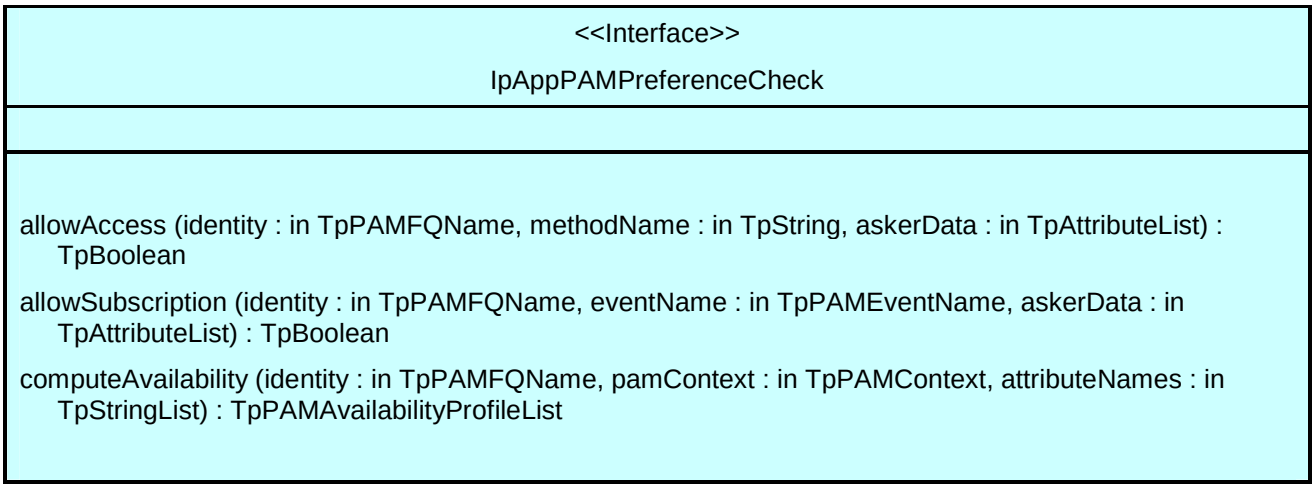
Raises

TpCommonExceptions, P_PAM_UNKNOWN_AGENT, P_PAM_UNKNOWN_CAPABILITY, P_PAM_UNKNOWN_ATTRIBUTE, P_PAM_INVALID_CREDENTIAL

8.2.5 Interface Class IpAppPAMPreferenceCheck

Inherits from: IpInterface

The purpose of this interface is to provide methods to be called by the PAM service to check for access control or to compute availability using an implementation provided by an application. Instances of this interface are registered using the setPreference() method in the availability management interface.



8.2.5.1 Method allowAccess()

Check the access permission for the asker for the specified method.

Returns True if the access is allowed, false if denied.

Parameters

`identity : in TpPAMFQName`

Specifies the identity for which the access is being requested.

`methodName : in TpString`

Specifies the method being requested.

`askerData : in TpAttributeList`

Specifies the asker.

Returns

`TpBoolean`

8.2.5.2 Method allowSubscription()

Check the access permission for the asker to register for the specified event.

Returns True if the subscription is allowed, false if denied.

Parameters

`identity : in TpPAMFQName`

Specifies the identity for which the access is being requested.

`eventName : in TpPAMEventName`

Specifies the event being registered to.

`askerData : in TpAttributeList`

Specifies the asker.

Returns

TpBoolean

8.2.5.3 Method computeAvailability()

Compute the availability for an identity for a given context. The data provided is the same as the data provided for the getAvailability call. The application implementing this interface uses the identity presence interface to get the current presence data and maintains its own user preferences to compute the availability.

Returns a value containing a list of attributes as available to the asker in the requested context. If no information is available to the asker an empty list is returned.

Parameters

identity : in TpPAMFQName

Specifies the identity for which the availability is being requested.

pamContext : in TpPAMContext

Specifies the context for which the availability is requested.

attributeNames : in TpStringList

Specifies the attributes of interest. Can be an empty list to indicate all attributes.

Returns

TpPAMAvailabilityProfileList

8.3 PAM Event SCF Interface Classes

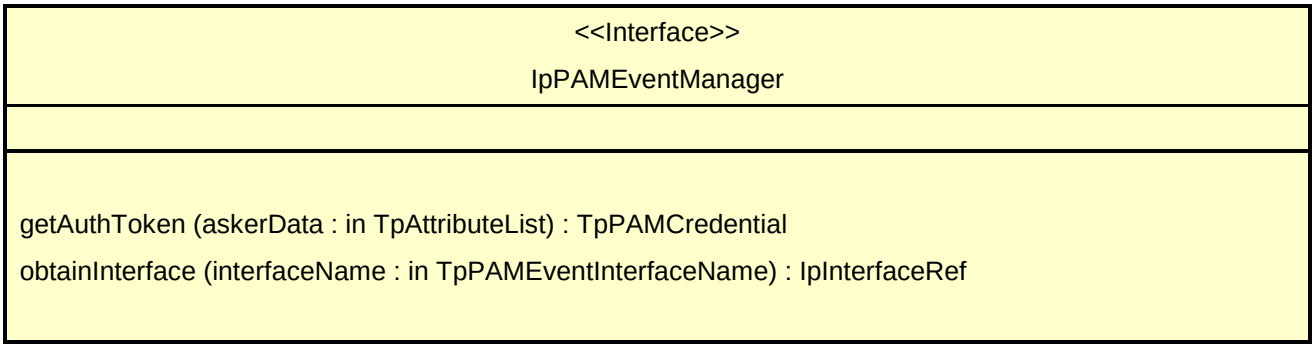
This service contains an interface for registering for notifications for events that occur within the PAM service.

8.3.1 Interface Class IpPAMEventManager

Inherits from: IpService

The purpose of this interface is to supply the various interfaces available in this service to the application and to provide the authentication credentials. This interface is the only discoverable interface from the framework.

All PAM methods use an authentication token as a parameter since the outcome of the operations may depend on the entity requesting the operation. To enable this, the getAuthToken() method is used to obtain an implementation dependent token. An application that has authenticated itself with the OSA framework, can get an authentication token for itself. Alternatively, if the application is requesting PAM operations on behalf of multiple entities, authentication tokens may be requested for each such entity after providing any available data about the asker. These tokens can then be used repeatedly for operations within a session without further need to identify the asker.



8.3.1.1 Method getAuthToken()

Get an authentication token for access to the interface methods.

Returns an implementation-dependent authentication credential that can be verified.

Parameters

`askerData : in TpAttributeList`

Specifies information about the asker. Can be an empty array.

Returns

`TpPAMCredential`

Raises

`TpCommonExceptions, P_PAM_INVALID_CREDENTIAL`

8.3.1.2 Method obtainInterface()

Obtain available interfaces from the service. The valid parameters for this method can be obtained from the service property P_OBTAINABLE_INTERFACES.

Returns the requested interface.

Parameters

`interfaceName : in TpPAMEventInterfaceName`

Specifies the name of the required interface.

Returns

`IpInterfaceRef`

Raises

`TpCommonExceptions, P_PAM_UNAVAILABLE_INTERFACE`

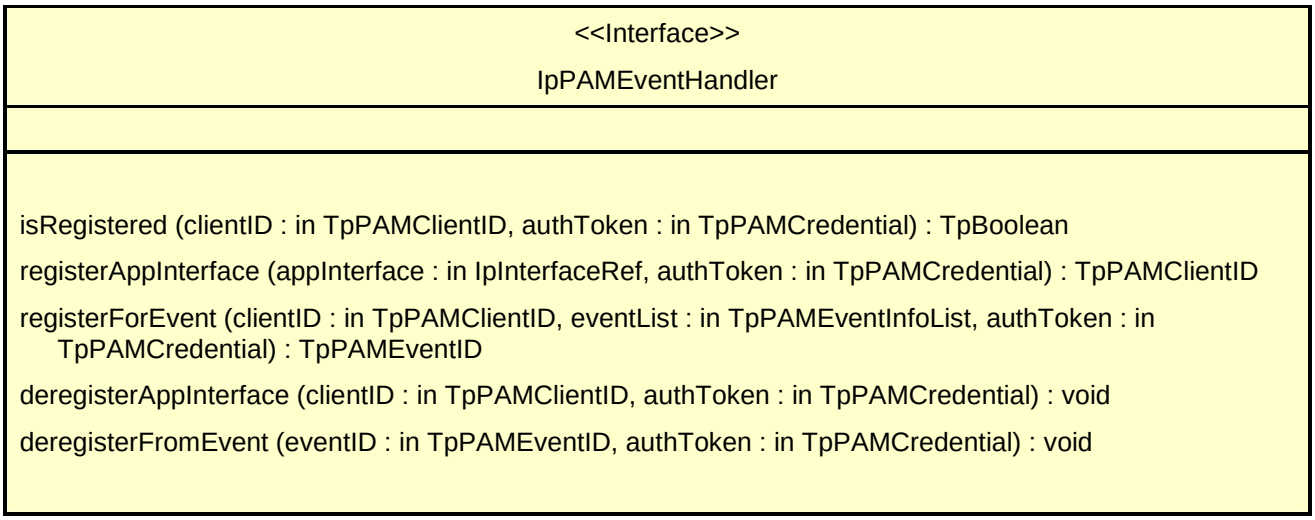
8.3.2 Interface Class IpPAMEventHandler

Inherits from: IpInterface

The purpose of this interface is to manage the registrations of interest in events and the registration of client interfaces for subsequent notification. All notifications in the present document are to be sent after the corresponding event has occurred and are asynchronous. An application must first register a notification interface with the service. It can then register interest in one or more events for this interface.

A failure or a reset of a PAM implementation may result in a loss of all prior event and interface registrations. The client application may need to confirm the continued registration of the notification interface and re-register if necessary.

For security and privacy purposes, a registration for an event is allowed if and only if the supplied credentials during registration is sufficient to have allowed access to the information related to the event through one or more of the PAM interface methods.



8.3.2.1 Method isRegistered()

Check if a client application interface is registered.

Returns True if the registration ID is still valid, False otherwise.

Parameters

clientID : in TpPAMClientID

Specifies the registration ID provided at registration.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpBoolean

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.3.2.2 Method registerAppInterface()

Register a client application's notification interface.

Returns an ID returned by the service that uniquely identifies this registration.

Parameters

appInterface : in IpInterfaceRef

Specifies the client notification interface.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpPAMClientID

Raises

TpCommonExceptions, P_PAM_INVALID_CREDENTIAL

8.3.2.3 Method registerForEvent()

Register a client application's interest in one or more events.

Returns an ID returned by the service that uniquely identifies this registration for the event.

Parameters

clientID : in TpPAMClientID

Specifies the registration ID provided at registration.

eventList : in TpPAMEventInfoList

Specifies the events of interest.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Returns

TpPAMEventID

Raises

TpCommonExceptions, P_PAM_NOT_REGISTERED, P_PAM_INVALID_CREDENTIAL

8.3.2.4 Method deregisterAppInterface()

Unregister a client application's notification interface.

All registrations for events for this client registration are also removed.

Parameters

clientID : in TpPAMClientID

Specifies the registration ID provided at registration.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

Raises

TpCommonExceptions, P_PAM_NOT_REGISTERED, P_PAM_INVALID_CREDENTIAL

8.3.2.5 Method deregisterFromEvent()

Unregister a client application's interest in an event.

Parameters

eventID : in TpPAMEventID

Specifies a prior event registration ID.

authToken : in TpPAMCredential

Credential of the entity who wishes to do this operation.

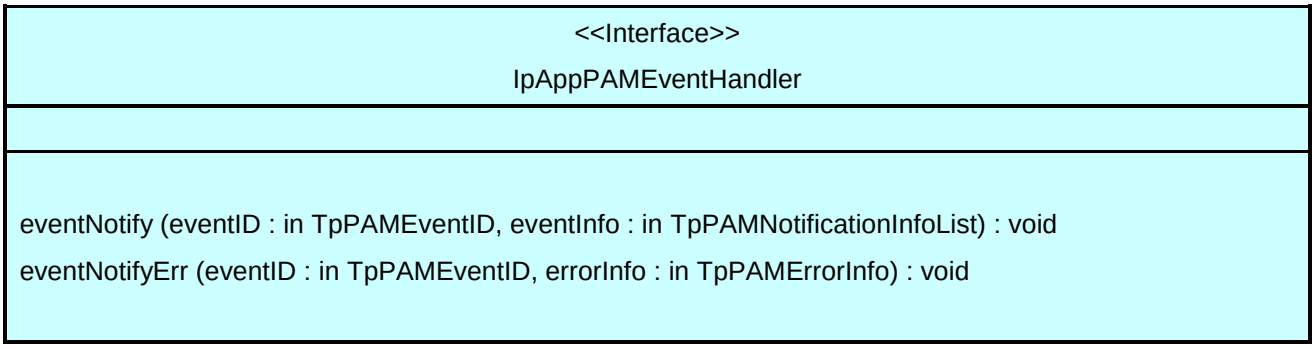
Raises

TpCommonExceptions, P_PAM_NOT_REGISTERED, P_PAM_INVALID_CREDENTIAL

8.3.3 Interface Class IpAppPAMEventHandler

Inherits from: IpInterface

This is the interface that a client application must implement and register with the Event Service in order to be notified of events.



8.3.3.1 Method eventNotify()

Notify the occurrence of an event. The implementations will not attempt to re-notify on failure.

Parameters

eventID : in TpPAMEventID

Specifies a prior event registration ID.

eventInfo : in TpPAMNotificationInfoList

contains the data about the events that occurred.

8.3.3.2 Method eventNotifyErr()

Notify an error in the event reporting. The error may concern all assignments, one whole assignment or a part of it. An eventNotify is sent after the error condition has passed away unless the event has been subsequently deregistered. Re-registration may only be needed in fatal system error cases. Note that in normal operation unavailable or protected pieces of presence information are delivered by the normal reporting methods instead of an error method.

Parameters

`eventID : in TpPAMEventID`

Specifies a prior event registration ID.

`errorInfo : in TpPAMErrorInfo`

contains the data relating to the error.

9 State Transition Diagrams

There are no State Transition Diagrams for the Presence and Availability Management SCFs.

10 PAM Service Properties

The following table lists properties relevant to all the PAM SCFs.

Property	Type	Description
P_OBTAINABLE_INTERFACES	STRING_SET	The interfaces obtainable from the service

10.1 PAM Provisioning service properties

Implementations of the PAM Provisioning APIs for 3GPPshall have the Service Properties set to the indicated values:

```
P_OBTAINABLE_INTERFACES = {}
```

10.2 PAM Presence and Availability Service

Implementations of the PAM Presence and Availability APIs for 3GPPshall have the Service Properties set to the indicated values:

```
P_OBTAINABLE_INTERFACES = {
P_PAM_IDENTITY_PRESENCE,
P_PAM_AVAILABILITY
}
```

10.3 PAM Event Service

PAM Event service has the following property in addition to the above.

Property	Type	Description
P_EVENT_TYPES	INTEGER_SET	The pre-defined event types that can be registered for.

Implementations of the PAM Event APIs for 3GPP shall have the Service Properties set to the indicated values:

```
P_OBTAINABLE_INTERFACES = {
P_PAM_EVENT_HANDLER
}
P_EVENT_TYPES = {
PAM_CE_IDENTITY_PRESENCE_SET,
PAM_CE_AVAILABILITY_CHANGED,
PAM_CE_WATCHERS_CHANGED
}
```

11 PAM Data Definitions

All data types referenced in the present document but not defined in this clause are common data definitions which may be found in ES 202 915-2.

11.1 Entity Address Definitions

11.1.1 TpPAMFQName

This is the same as TpAddress and is used to address entities in presence and availability service.

11.1.2 TpPAMFQNameList

This is a `Numbered List of Data Elements` of type TpPAMFQName.

11.2 Attribute Data Definitions

11.2.1 TpPAMAttribute

This is a `Sequence of Data Elements` containing the attribute name, type, expiration time and value. This is derived from the common attribute type TpAttribute to add the expiration value for dynamic attributes.

Sequence Element Name	Sequence Element Type	Notes
AttributeName	TpString	The name of the attribute.
AttributeType	TpAttributeType	The type of the attribute. Valid values for Type must include at least TpString, TpInt32 and TpFloat.
AttributeValue	TpAny	The values for the attribute. This model allows multi-valued attributes. Cannot be an empty list.
ExpiresIn	TpPAMTimeInterval	The interval in milliseconds in which the attribute values are valid. A time interval of PAM_MAX_LONGINT indicates static attribute values that never expire. A time interval of 0 or negative values indicate an expired value and the time for which it has expired.

11.2.2 TpPAMAttributeList

This is a `Numbered List of Data Elements` of type TpPAMAttribute.

11.2.3 TpPAMAttributeDef

This is a `Sequence of Data Elements` containing the definition of an attribute. This definition constitutes the "schema" for an attribute and contains fields to define the type and behavior of a dynamic attribute. Each definition using these fields results in a TpPAMAttribute with the corresponding name and type and dynamic behavior as defined by the remaining fields.

Sequence Element Name	Sequence Element Type	Notes
Name	TpString	Name of attribute.
Type	TpString	Type of attribute. Valid values for Type must include at least TpString, TpInt32 and TpFloat.
IsStatic	TpBoolean	True indicates that the attributes is always static and its values never expire. False indicates that the attribute can be dynamic and may contain values that expire.
IsRevertOnExpiration	TpBoolean	True indicates that the attribute reverts to the default value on expiration. False indicates that the attribute will not revert to the default value.
DefaultValues	TpAny	An attribute is always initialized with this value. If the isRevertOnExpiration attribute is set to true, a dynamic attribute that has expired while stored in a PAM implementation is reset to this value with the expiresIn interval set to PAM_MAX_LONGINT. The default attribute value is interpreted based on the value of the attribute Type.

11.2.4 TpPAMAttributeDefList

This is a `Numbered List of Data Elements` of type TpPAMAttributeDef.

11.3 Presence Data Definitions

11.3.1 TpPAMCapability

This defines the communication capabilities.

Name	Value	Description
PAM_VOICE	0	Capability for voice calls
PAM_SMS	1	Capability for SMS
PAM_IM	2	Capability for Instant Messaging
PAM_MMS	3	Capability for Multi-media messaging

11.3.2 TpPAMCapabilityList

This is a `Numbered List of Data Elements` of type TpPAMCapability.

11.3.3 TpPAMPresenceData

This is a `Sequence of Data Elements` for a presence record. Since multiple presence data records can be associated with an identity, each distinct record is uniquely named.

Sequence Element Name	Sequence Element Type	Notes
Name	TpString	Name of presence data
PresenceAttributes	TpPAMAttributeList	Presence Attributes

11.3.4 TpPAMPresenceDataList

This is a `Numbered List of Data Elements` of type TpPAMPresenceData.

11.4 Pre-defined Presence type

11.4.1 Presentity

An identity type Presentity is pre-defined for all identities associated with the attribute PresenceProfile defined as:

Attribute Definition Field	Value
Name	PresenceProfile
Type	TpPAMPresenceData
IsStatic	False
IsRevertOnExpiration	False
DefaultValues	Null

11.5 Availability Data Definitions

11.5.1 TpPAMAvailabilityProfile

This is a `Sequence of Data Elements` containing the list of attribute values as determined by the definition of the context for which the availability is provided.

Sequence Element Name	Sequence Element Type	Notes
PrivacyCode	TpPAMPrivacyCode	Contains the privacy codes
AvailabilityData	TpPAMPresenceData	Contains a list of presence attributes

11.5.2 TpPAMAvailabilityProfileList

This is a `Numbered List of Data Elements` of type TpPAMAvailabilityProfile.

11.5.3 TpPAMPrivacyCode

This data type is identical to a TpString, and is defined as a string of characters that specify the privacy code for availability profiles. These codes are just indications of the privacy expected by the service and not are meant to be enforced by the service. Other Network operator specific codes may also be used, but should be preceded by the string "S_". The following values are defined.

Character String Value	Description
PAM_CP_ASKER_ONLY	The profile is available to the asker only and should not be further transmitted
PAM_CP_AUTHORIZED	The profile can be provided by the asker to authorized entities
PAM_CP_UNLIMITED	The profile can be distributed without limits

11.6 Availability Context Data Definitions

Availability is always queried for in a specific context on behalf of an asker. There is one context for communication pre-defined in this version of the specification.

11.6.1 TpPAMContext

This is a Sequence of Data Elements containing the data which defines the context in which an availability is queried and information about the asker that is requesting the data.

Sequence Element Name	Sequence Element Type	Notes
ContextData	TpPAMContextData	Contains the context name and the list of attributes that define the context. The attributes to be included for a given context are specified by the definition of the context.
AskerData	TpAttributeList	Contains information about the asker of availability. The exact attributes in this list are dependent on the application. PAM reserves the attribute "name" with type TpPAMFQName to contain the identity of the asker if known.

.

11.6.2 TpPAMContextName

This specifies the availability contexts.

Name	Value	Description
PAM_CONTEXT_ANY	0	Denotes any known context
PAM_CONTEXT_COMMUNICATION	1	Denotes a communication context

11.6.3 TpPAMContextData

This is a tagged choice of data elements that specifies the optional data that may be required to define a particular context

	Tag Element Type	
	TpPAMContextName	

Tag Element Value	Choice Element Type	Choice Element Name
PAM_CONTEXT_ANY	None	Undefined
PAM_CONTEXT_COMMUNICATION	TpPAMCommunicationContext	CommunicationContext

11.6.4 TpPAMCommunicationContext

This is a Sequence of Data Elements containing the list of attribute values for defining a communication context.

Sequence Element Name	Sequence Element Type	Notes
CommunicationCapability	TpPAMCapability	Specifies the communication type for which the availability is requested

11.6.5 TpPAMContextList

This is a Numbered List of Data Elements of type TpPAMContext.

11.7 Credential data definitions

11.7.1 TpPAMCredential

This is the same as TpOctetSet. This data is opaque to the application and is implementation dependent. As this data is valid only in the context of a single session with the service and hence cannot be used across multiple services, there are no inter-operability issues here. The application simply uses the credential returned from the getAuthToken() method in all other methods that require the credentials.

11.8 Availability and Access Control Preference Data Definitions

PAM allows several types of preferences to be specified. It includes an access control list specifying who is allowed to check for presence or subscribe to presence data for each identity. It also includes an interface for an application to register an interface to do access control checks and availability computations outside of the presence service.

11.8.1 TpPAMAccessControlData

This is a `Sequence of Data Elements` for access control data.

Sequence Element Name	Sequence Element Type	Notes
DefaultPolicy	TpPAMACLDefault	Specifies whether the default policy is to allow or deny access for names not mentioned in the list
AllowList	TpPAMFQNameList	Specifies a list of identities to be allowed access
DenyList	TpPAMFQNameList	Specifies a list of identities to be denied access

11.8.2 TpPAMACLDefault

Defines the two possible default policies for access control.

Name	Value	Description
PAM_ACCESS_ALLOW	0	Allow access by default
PAM_ACCESS_DENY	1	Deny access by default

11.8.3 TpPAMPreferenceOp

This data type is identical to a TpString, and is defined as a string of characters that specify the operations to be performed with a preference. The following values are defined.

Character String Value	Description
PAM_ACCESS_ADD	Add the specified preference to the current preferences
PAM_ACCESS_DELETE	Delete the specified preference from the current preferences
PAM_ACCESS_REPLACE	Replace the current preferences with the specified preference

11.8.4 TpPAMPreferenceType

This specifies the names of privacy and access control mechanisms supported by the service.

Character String Value	Description
PAM_ACCESS_LIST	The control data contains additions or modifications to access control list of who is authorized to access the presence information or subscribe to it.
PAM_EXTERNAL_CONTROL	The access control and availability computations are done external to the presence service.

11.8.5 TpPAMPreferenceData

This is a `tagged choice of data elements` that specifies the preference data. The data depends on the type of preference being specified.

	Tag Element Type	
	TpPAMPreferenceType	

Tag Element Value	Choice Element Type	Choice Element Name
PAM_ACCESS_LIST	TpPAMAccessControlData	AccessControl
PAM_EXTERNAL_CONTROL	IpInterfaceRef	ExternalControlInterface

11.9 Time data definitions

11.9.1 TpPAMTimeInterval

This is identical to TpInt64.

11.10 Pre-defined Entity Types and Attributes

This version of the specification pre-defines one identity type called "Presentity". The following constant can be used to refer to this Identity Type. All identities in the PAM service are associated with this identity type. For example, the identityType parameter in IpIdentityPresence and IpEventHandler methods take this as the value. This is also used in the event registration data structure (e.g., TpPAMAVCEventData) in the IdentityType field.

Character String Value	Description
P_PAM_PRESENTITY_TYPE	The pre-defined identity type called Presentity.

Every identity type in PAM can be defined with a set of attributes that are associated with all identities of that type. The following dynamic attributes are pre-defined as attributes of type TpPAMAttribute for the "Presentity" identity type and shall be supported as attributes of all identities in implementations of this service. These attributes are defined using TpPAMAttributeDef fields as follows:

AttributeName	AttributeType	IsStatic	IsRevertOn Expiration	DefaultValue	Description
P_SUBSCRIBER_STATUS	P_STRING	False	False	None	Specifies the status of the subscriber.
P_NETWORK_STATUS	P_STRING	False	False	None	Specifies the status of the network.
P_COMMUNICATION_ MEANS	P_PAM_CAPABILITY	False	False	None	Specifies the means of communication. The type is TpPAMCapability.
P_CONTACT_ADDRESS	P_ADDRESS	False	False	None	Address for communication
P_SUBSCRIBER_PROVIDED_ LOCATION	P_STRING	False	False	None	Location information provided by subscriber. Is optional.
P_NETWORK_PROVIDED_ LOCATION	P_STRING	False	False	None	Location information provided by subscriber. Is optional.
P_PRIORITY	P_INT32	False	False	None	Priority for communication.
P_OTHER_INFO	P_STRING	False	False	None	Additional information.

11.11 Interface name definitions

This clause defines the names to be used for obtaining interfaces from the corresponding service interfaces in each PAM SCF.

11.11.1 TpPAMProvisioningInterfaceName

This data type is identical to a TpString, and is defined as a string of characters that identify the names of the PAM Provisioning interfaces that are to be supported by the OSA API.

Character String Value	Description
P_PAM_IDENTITY_MANAGEMENT	The name for the PAM Identity Management interface
P_PAM_AGENT_MANAGEMENT	The name for the PAM Agent Management interface
P_PAM_AGENT_ASSIGNMENT	The name for the PAM Agent Assignment interface
P_PAM_IDENTITY_TYPE_MANAGEMENT	The name for the PAM Identity Type Management interface
P_PAM_AGENT_TYPE_MANAGEMENT	The name for the PAM Agent Type Management interface
P_PAM_CAPABILITY_TYPE_MANAGEMENT	The name for the PAM Capability Type Management interface

11.11.2 TpPAMPresenceAvailabilityInterfaceName

This data type is identical to a TpString, and is defined as a string of characters that identify the names of the PAM Presence and Availability interfaces that are to be supported by the OSA API.

Character String Value	Description
P_PAM_IDENTITY_PRESENCE	The name for the PAM Identity Presence interface
P_PAM_AGENT_PRESENCE	The name for the PAM Agent Presence interface
P_PAM_AVAILABILITY	The name for the PAM Availability interface

11.11.3 TpPAMEventInterfaceName

This data type is identical to a TpString, and is defined as a string of characters that identify the names of the PAM Event management interfaces that are to be supported by the OSA API.

Character String Value	Description
P_PAM_EVENT_HANDLER	The name for the Event Handler interface.

11.12 Event data definitions

There are two sets of data structures used for events. One set is used by applications to provide information when registering for an event and the second set is used to supply information to the applications in the notifications when the events occur.

11.12.1 TpPAMClientID

This is the same is TpInt32 and is used to identify, uniquely within an implementation, registration of an application interface for notification of events.

11.12.2 TpPAMEventID

This is the same as TpAssignmentID and is used to identify, uniquely within an implementation, a registration for a specific event.

11.12.3 TpPAMEventName

This data type identifies the values that specify the event names.

Name	Value	Description
PAM_CE_IDENTITY_PRESENCE_SET	0	Notify if the value of presence attributes of an identity is explicitly set
PAM_CE_AVAILABILITY_CHANGED	1	Notify if the availability of an identity changes
PAM_CE_WATCHERS_CHANGED	2	Notify if the current set of watchers change
PAM_CE_IDENTITY_CREATED	3	Notify if a new identity has been created
PAM_CE_IDENTITY_DELETED	4	Notify if an identity has been deleted
PAM_CE_GROUP_MEMBERSHIP_CHANGED	5	Notify if the membership of a group changes.
PAM_CE_AGENT_CREATED	6	Notify if a new agent has been created
PAM_CE_AGENT_DELETED	7	Notify if an agent has been deleted
PAM_CE_AGENT_ASSIGNED	8	Notify if an agent is assigned to an identity
PAM_CE_AGENT_UNASSIGNED	9	Notify if an agent has been unassigned from an identity
PAM_CE_CAPABILITY_CHANGED	10	Notify if the capability of an identity changes
PAM_CE_AGENT_CAPABILITY_PRESENCE_SET	11	Notify if the value of presence attributes of an agent is explicitly set
PAM_CE_AGENT_PRESENCE_SET	12	Notify if the value of presence attributes of an agent is explicitly set

11.12.4 TpPAMEventNameList

This is a `Numbered List of Data Elements` of type TpPAMEventName.

Each event is defined by the data that applications must provide during registration using TpPAMEventInfo and data that is provided to the application during notification of such events using TpPAMNotificationInfo.

11.12.5 TpPAMEventInfo

This is a `tagged choice of data elements` that specifies the event data provided by applications while registering.

	Tag Element Type	
	TpPAMEventName	

Tag Element Value	Choice Element Type	Choice Element Name
PAM_CE_IDENTITY_PRESENCE_SET	TpPAMIPSEventData	IdentityPresenceSet
PAM_CE_AVAILABILITY_CHANGED	TpPAMAVCEventData	AvailabilityChanged
PAM_CE_WATCHERS_CHANGED	TpPAMWCEventData	WatchersChanged
PAM_CE_IDENTITY_CREATED	TpPAMICEventData	IdentityCreated
PAM_CE_IDENTITY_DELETED	TpPAMIDEventData	IdentityDeleted
PAM_CE_GROUP_MEMBERSHIP_CHANGED	TpPAMGMCEventData	GroupMembershipChanged
PAM_CE_AGENT_CREATED	TpPAMACEventData	AgentCreated
PAM_CE_AGENT_DELETED	TpPAMADEventData	AgentDeleted
PAM_CE_AGENT_ASSIGNED	TpPAMAAEventData	AgentAssigned
PAM_CE_AGENT_UNASSIGNED	TpPAMAUEventData	AgentUnassigned
PAM_CE_CAPABILITY_CHANGED	TpPAMCCEventData	CapabilityChanged
PAM_CE_AGENT_CAPABILITY_PRESENCE_SET	TpPAMACPSEventData	AgentCapabilityPresenceSet
PAM_CE_AGENT_PRESENCE_SET	TpPAMAPSEventData	AgentPresenceSet

11.12.6 TpPAMEventInfoList

This is a `Numbered List of Data Elements` of type TpPAMEventInfo.

11.12.7 TpPAMNotificationInfo

This is a `tagged choice of data elements` that specifies the notification data provided to the applications for each event.

	Tag Element Type	
	TpPAMEventName	

Tag Element Value	Choice Element Type	Choice Element Name
PAM_CE_IDENTITY_PRESENCE_SET	TpPAMIPSNotificationData	IdentityPresenceSetNotify
PAM_CE_AVAILABILITY_CHANGED	TpPAMAVCNotificationData	AvailabilityChangedNotify
PAM_CE_WATCHERS_CHANGED	TpPAMWCNotificationData	WatchersChangedNotify
PAM_CE_IDENTITY_CREATED	TpPAMICNotificationData	IdentityCreatedNotify
PAM_CE_IDENTITY_DELETED	TpPAMIDNotificationData	IdentityDeletedNotify
PAM_CE_GROUP_MEMBERSHIP_CHANGED	TpPAMGMCNotificationData	GroupMembershipChangedNotify
PAM_CE_AGENT_CREATED	TpPAMACNotificationData	AgentCreatedNotify
PAM_CE_AGENT_DELETED	TpPAMADNotificationData	AgentDeletedNotify
PAM_CE_AGENT_ASSIGNED	TpPAMAANotificationData	AgentAssignedNotify
PAM_CE_AGENT_UNASSIGNED	TpPAMAUNotificationData	AgentUnassignedNotify
PAM_CE_CAPABILITY_CHANGED	TpPAMCCNotificationData	CapabilityChangedNotify
PAM_CE_AGENT_CAPABILITY_PRESENCE_SET	TpPAMACPSNotificationData	AgentCapabilityPresenceSetNotify
PAM_CE_AGENT_PRESENCE_SET	TpPAMAPSNotificationData	AgentPresenceSetNotify

11.12.8 TpPAMNotificationInfoList

This is a `Numbered List of Data Elements` of type TpPAMNotificationInfo.

11.12.9 PAM_CE_IDENTITY_CREATED

Notify if a new identity has been created. Notifications for creation of multiple identities are bunched into a single notification whenever possible. A notification of this event is NOT sent for new association of types with an existing identity.

11.12.9.1 TpPAMICEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to identity creations. The event is registered for changes in any agents of the named type. If no identity types are named, then the event is registered for all identity types.

Sequence Element Name	Sequence Element Type	Notes
IdentityType	TpStringList	Specifies the type of the identities for which this notification is requested. Can be an empty array if notification required for identities of any type

11.12.9.2 TpPAMICNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for identity creation events.

Sequence Element Name	Sequence Element Type	Notes
Identities	TpPAMFQNameList	Contains the names of the identities that have been created.

11.12.10 PAM_CE_IDENTITY_DELETED

Notify if an identity has been deleted. Notifications for deletion of multiple identities are bunched into a single notification whenever possible. A notification of this event is NOT sent for removing association of types with an existing identity.

11.12.10.1 TpPAMIDEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to identity deletions. The event is registered for changes in any of the named identities. If no identities are named, then the event is registered for all agents.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity whose deletion is to be notified. Can be an empty array.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if identityName is an empty array. Can be an empty array if notification required for identities of any type.

11.12.10.2 TpPAMIDNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for identity deletion events.

Sequence Element Name	Sequence Element Type	Notes
Identities	TpPAMFQNameList	Contains the names of the identities that have been deleted.

11.12.11 PAM_CE_GROUP_MEMBERSHIP_CHANGED

Notify if the membership of a group changes. Notifications for changes to multiple groups are bunched into a single notification whenever possible.

11.12.11.1 TpPAMGMCEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to group membership changes. The event is registered for changes in any of the named groups. If no groups are named, then the event is registered for all groups.

Sequence Element Name	Sequence Element Type	Notes
GroupName	TpPAMFQNameList	Specifies the name of the group for which the change is to be notified. Can be an empty array if notifications are required for any group.
GroupType	TpStringList	Specifies the type of the group for which this notification is requested if the groupName is specified as an empty array. Can be an empty array if notification required for groups of any type.

11.12.11.2 TpPAMGMCNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for group membership changes.

Sequence Element Name	Sequence Element Type	Notes
Groups	TpPAMFQNameList	Contains the names of the groups that have been changed.

11.12.12 PAM_CE_AGENT_CREATED

Notify if a new agent has been created. Notifications for creation of multiple agents are bunched into a single notification whenever possible. The notification for this event is NOT sent for new associations of types with agents.

11.12.12.1 TpPAMACEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent creations. The event is registered for changes in any agents of the named type. If no agent types are named, then the event is registered for all agent types.

Sequence Element Name	Sequence Element Type	Notes
AgentType	TpStringList	Specifies the type of the agents for which this notification is requested. Can be an empty array if notification required for agents of any type.

11.12.12.2 TpPAMACNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for agent creation events.

Sequence Element Name	Sequence Element Type	Notes
Agents	TpPAMFQNameList	Contains the names of the agents that have been created.

11.12.13 PAM_CE_AGENT_DELETED

Notify if an agent has been deleted. Notifications for deletion of multiple agents are bunched into a single notification whenever possible. This event notification is NOT sent for disassociating a type from an agent.

11.12.13.1 TpPAMADEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent deletions. The event is registered for changes in any of the named agents. If no agents are named, then the event is registered for all agents.

Sequence Element Name	Sequence Element Type	Notes
AgentName	TpPAMFQNameList	Specifies the name of the agent whose deletion is to be notified. Can be an empty array.
AgentType	TpStringList	Specifies the type of the agent for which this notification is requested if agentName is an empty array. Can be an empty array if notification required for agents of any type.

11.12.13.2 TpPAMADNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for agent deletion events.

Sequence Element Name	Sequence Element Type	Notes
Agents	TpPAMFQNameList	Contains the names of the agents that have been deleted.

11.12.14 PAM_CE_AGENT_ASSIGNED

Notify if an agent is assigned to an identity.

11.12.14.1 TpPAMAAEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent assignments from an identity. The event is registered for changes in any of the named agents. If no agents are named, then the event is registered for any agent.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity for which the assignment is to be notified. Can be an empty array if notification is required for any identity instance.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
AgentName	TpPAMFQNameList	Specifies the name of the agent whose assignment is to be notified. Can be an empty array.
AgentType	TpStringList	Specifies the type of the agent for which this notification is requested if agentName is an empty array. Can be an empty array if notification required for agents of any type.

11.12.14.2 TpPAMAANotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for agent assignment events.

Sequence Element Name	Sequence Element Type	Notes
Identity	TpPAMFQName	Contains the name of the identity to whom an agent has been assigned.
Agent	TpPAMFQName	Contains the name of the agent that has been assigned.

11.12.15 PAM_CE_AGENT_UNASSIGNED

Notify if an agent has been unassigned from an identity.

11.12.15.1 TpPAMAUEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent unassignments from an identity. The event is registered for changes in any of the named agents. If no agents are named, then the event is registered for all assigned agents.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity for which the unassignment is to be notified. Can be an empty array if notification is required for any identity instance.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
AgentName	TpPAMFQNameList	Specifies the name of the agent whose unassignment is to be notified. Can be an empty array
AgentType	TpStringList	Specifies the type of the agent for which this notification is requested if agentName is an empty array. Can be an empty array if notification required for agents of any type

11.12.15.2 TpPAMAUNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for agent unassignment events.

Sequence Element Name	Sequence Element Type	Notes
Identity	TpPAMFQName	Contains the name of the identity from whom an agent has been unassigned.
Agent	TpPAMFQName	Contains the name of the agent that has been unassigned.

11.12.16 PAM_CE_CAPABILITY_CHANGED

Notify if the capability of an identity changes.

11.12.16.1 TpPAMCCEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to identity capability changed events. The event is registered for changes in any of the named capabilities. If no capabilities are named, then the event is registered for all capabilities.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity for which the capability change is to be notified. Can be an empty array if notification is required for any identity instance
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
Capabilities	TpPAMCapabilityList	Specifies the capabilities of interest. Can be an empty array if notifications are required for any capability.

11.12.16.2 TpPAMCCNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for capability change events.

Sequence Element Name	Sequence Element Type	Notes
Identity	TpPAMFQName	Contains the name of the identity whose capability has changed.
Capabilities	TpPAMCapabilityList	Contains the capabilities that have changed (i.e., added or removed).

11.12.17 PAM_CE_AGENT_CAPABILITY_PRESENCE_SET

Notify if the value of capability presence attributes of an agent is set. Expiration of the dynamic attributes does not trigger this notification.

11.12.17.1 TpPAMACPSEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent capability presence set events. The event is registered for changes in any of the named attributes. If no attributes are named, then the event is registered for all attributes in the presence information.

Sequence Element Name	Sequence Element Type	Notes
AgentName	TpPAMFQNameList	Specifies the name of the agent for which the capability presence change is to be notified. Can be an empty array if notification is required for any agent instance.
AgentType	TpStringList	Specifies the type of the agent for which this notification is requested if the agentName is specified as an empty array. Can be an empty array if notification required for agents of any type.
Capabilities	TpPAMCapabilityList	Specifies the capabilities of interest. Can be an empty array if notifications are required for any capability.
AttributeNames	TpStringList	Specifies attributes of interest. Can be an empty array
ReportingPeriod	TpPAMTimeInterval	Specifies the interval for periodic reporting (regardless of change). If -1, the event notification happens only on a change. If 0, there is a single immediate notification.

11.12.17.2 TpPAMACPSNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for capability presence set events.

Sequence Element Name	Sequence Element Type	Notes
Agent	TpPAMFQName	Contains the name of the agent whose capability presence has changed.
Capability	TpPAMCapability	Specifies the capability for which the presence has changed.
AttributeNames	TpStringList	Contains the attribute names that have changed in value.

11.12.18 PAM_CE_AGENT_PRESENCE_SET

Notify if the value of presence attributes of an agent is set. Expiration of the dynamic attributes does not trigger this notification.

11.12.18.1 TpPAMAPSEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to agent presence set events. The event is registered for changes in any of the named attributes. If no attributes are named, then the event is registered for all attributes in the presence information.

Sequence Element Name	Sequence Element Type	Notes
AgentName	TpPAMFQNameList	Specifies the name of the agent for which the assignment is to be notified. Can be an empty array if notification is required for any agent instance.
AgentType	TpStringList	specifies the type of the agent for which this notification is requested if the agentName is specified as an empty array. Can be an empty array if notification required for agents of any type.
AttributeNames	TpStringList	Specifies attributes of interest. Can be an empty array
ReportingPeriod	TpPAMTimeInterval	Specifies the interval for periodic reporting (regardless of change). If -1, the event notification happens only on a change. If 0, there is a single immediate notification.

11.12.18.2 TpPAMAPSNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for agent presence set events.

Sequence Element Name	Sequence Element Type	Notes
Agent	TpPAMFQName	Contains the name of the agent whose capability has changed
AttributeNames	TpStringList	Contains the attribute names that have changed in value

11.12.19 PAM_CE_IDENTITY_PRESENCE_SET

Notify if the value of presence attributes of an identity is set. Expiration of the dynamic attributes do not trigger this notification.

11.12.19.1 TpPAMIPSEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to identity presence set events. The event is registered for changes in any of the named attributes. If no attributes are named, then the event is registered for all attributes in the presence information.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity for which the assignment is to be notified. Can be an empty array if notification is required for any identity instance.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
AttributeNames	TpStringList	Specifies attributes of interest. Can be an empty array
ReportingPeriod	TpPAMTimeInterval	Specifies the interval for periodic reporting (regardless of change). If -1, the event notification happens only on a change. If 0, there is a single immediate notification even if there is no change. For all other values, there is a periodic notification at the specified time interval regardless of change.

11.12.19.2 TpPAMIPSNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for identity presence set events.

Sequence Element Name	Sequence Element Type	Notes
Identity	TpPAMFQName	Contains the name of the identity whose capability has changed.
Attributes	TpPAMPresenceDataList	Contains the attributes that have changed in value.

11.12.20 PAM_CE_AVAILABILITY_CHANGED

Notify if the availability of an identity changes. The event is registered for changes in any of the named attributes. If no attributes are named, then the event is registered for all attributes in the presence information.

11.12.20.1 TpPAMAVCEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to availability changed events.

Sequence Element Name	Sequence Element Type	Notes
IdentityName	TpPAMFQNameList	Specifies the name of the identity for which the assignment is to be notified. Can be an empty array if notification is required for any identity instance.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
PAMContext	TpPAMContextList	Specifies the context in which the availability is to be monitored. Cannot be an empty array.
AttributeNames	TpStringList	Specifies attributes of interest. Can be an empty array.
ReportingPeriod	TpPAMTimeInterval	Specifies the interval for periodic reporting (regardless of change). If -1, the event notification happens only on a change. If 0, there is a single immediate notification even if there is no change. For all other values, there is a periodic notification at the specified time interval regardless of change.

11.12.20.2 TpPAMAVCNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for availability changed events.

Sequence Element Name	Sequence Element Type	Notes
Identity	TpPAMFQName	Contains the name of the identity whose capability has changed.
Availability	TpPAMAvailabilityProfileList	Contains the availability information that has changed.

11.12.21 PAM_CE_WATCHERS_CHANGED

Notify if list of watchers for any event changed.

11.12.21.1 TpPAMWCEventData

This is a `Sequence of Data Elements` to specify the input data for subscribing to watchers changed events.

Sequence Element Name	Sequence Element Type	Notes
Events	TpPAMEventNameList	Specifies the list of events for which the watchers are to be monitored. Can be an empty array if notification is required for watchers to any event.
IdentityName	TpPAMFQNameList	Specifies the name of an identity for whom the change in watchers is to be notified. Can be an empty array if notification is required for any identity instance.
IdentityType	TpStringList	Specifies the type of the identity for which this notification is requested if the identityName is specified as an empty array. Can be an empty array if notification required for identities of any type.
ReportingPeriod	TpPAMTimeInterval	Specifies the interval for periodic reporting (regardless of change). If -1, the event notification happens only on a change. If 0, there is a single immediate notification even if there is no change. For all other values, there is a periodic notification at the specified time interval regardless of change.

11.12.21.2 TpPAMWCNotificationData

This is a `Sequence of Data Elements` to specify the data that is provided in the notifications for watchers changed events.

Sequence Element Name	Sequence Element Type	Notes
Event	TpPAMEventName	Contains the name of the event for which the watchers changed.
ChangeType	TpPAMwatcherChangeType	Specifies whether the listed watchers were added or deleted
Identity	TpPAMFQName	Contains the name of the identity whose capability has changed.
Watchers	TpPAMFQNameList	Contains the list of watchers involved in the change.

11.12.21.3 TpPAMwatcherChangeType

This specifies the values representing the type of change that occurred to the list of watchers.

Name	Value	Description
PAM_WATCHERS_PERIODIC	0	Periodic reporting, not necessarily a change.
PAM_WATCHERS_ADDED	1	Watchers added to the list.
PAM_WATCHERS_DELETED	2	Watchers deleted from the list.

11.13 Error Types

11.13.1 TpPAMErrorCause

This defines the types of errors reported by PAM.

Name	Value	Description
P_PAM_CAUSE_UNDEFINED	0	Undefined.
P_PAM_CAUSE_INVALID_ADDRESS	1	The request cannot be handled because the address specified is not valid.
P_PAM_CAUSE_SYSTEM_FAILURE	2	System failure. The request cannot be handled because of a general problem in the service or in the underlying network.
P_PAM_CAUSE_INFO_UNAVAILABLE	3	The information is currently not available.

11.13.2 TpPAMErrorInfo

This is a `Sequence of Data Elements` to specify the error notification data.

Sequence Element Name	Sequence Element Type	Description
Cause	TpPAMErrorCause	Contains information about the reason for the error.
ErrorData	TpPAMNotificationInfo	Contains information relevant to each error such as the identity for which the error exists and/or the attributes for which the error exists.

12 Presence and Availability Management Exception Classes

The following are the list of exception classes which are used in this interface of the API.

Name	Description
P_PAM_AGENT_EXISTS	Indicates that an Agent with the agentName already exists
P_PAM_ALIAS_EXISTS	Indicates that the specified alias is already associated to the Identity
P_PAM_ALIAS_NOT_UNIQUE	Indicates that the alias has already been assigned to another identity
P_PAM_ATTRIBUTE_EXISTS	Indicates that at least one of the named attributes already exists
P_PAM_DISASSOCIATED_TYPE	Indicates that one of the specified types is not associated with the named identity/agent
P_PAM_IDENTITY_EXISTS	Indicates that the specified Identity already exists
P_PAM_INVALID_CREDENTIAL	Indicates that the credential presented is not recognized or insufficient for the operation
P_PAM_IS_CYCLIC	Indicates that the requested operation will create cyclic relationship
P_PAM_MEMBER_EXISTS	Indicates that the specified member is already in the group
P_PAM_NO_CAPABILITY	Indicates that a supplied capability is not a capability of the requested agent. No attributes are affected
P_PAM_NOT_MEMBER	Indicates that the specified member is not member of the group
P_PAM_NOT_REGISTERED	Indicates that the interface was not previously registered

Name	Description
P_PAM_NOT_SUPPORTED	Implementation dependent status that indicates that this method is not supported by the implementation
P_PAM_TYPE_ASSOCIATED	Indicates that a named type has already been associated with the identity/agent
P_PAM_TYPE_EXISTS	Indicates that the named type already exists
P_PAM_UNASSIGNED_ALIAS	Indicates that the specified alias was not an alias of the named identity
P_PAM_UNAVAILABLE_INTERFACE	Indicates that the specified interface does not exist or is unavailable
P_PAM_UNKNOWN_AGENT	Indicates that the Agent with the specified name does not exist
P_PAM_UNKNOWN_ALIAS	Indicates that the Alias with the specified name does not exist
P_PAM_UNKNOWN_ASSIGNMENT	Indicates that no assignment exists for this identity and agent
P_PAM_UNKNOWN_ATTRIBUTE	Indicates that at least one of the specified attributes has not been defined or has not been associated with the specified object
P_PAM_UNKNOWN_ATTRIBUTES	Indicates that the specified attribute list contains attributes not part of the named object
P_PAM_UNKNOWN_CAPABILITY	Indicates that a supplied capability is not a capability of the requested agent, or has not been defined. No attributes are affected
P_PAM_UNKNOWN_GROUP	Indicates that the specified group identity does not exist
P_PAM_UNKNOWN_IDENTITY	Indicates that the specified identity does not exist
P_PAM_UNKNOWN_MEMBER	Indicates that the specified member identity does not exist
P_PAM_UNKNOWN_TYPE	Indicates that the named type does not exist / indicates that the named identity/agent has not been associated with the named type / indicates that a specified type name has not been defined as an agent type

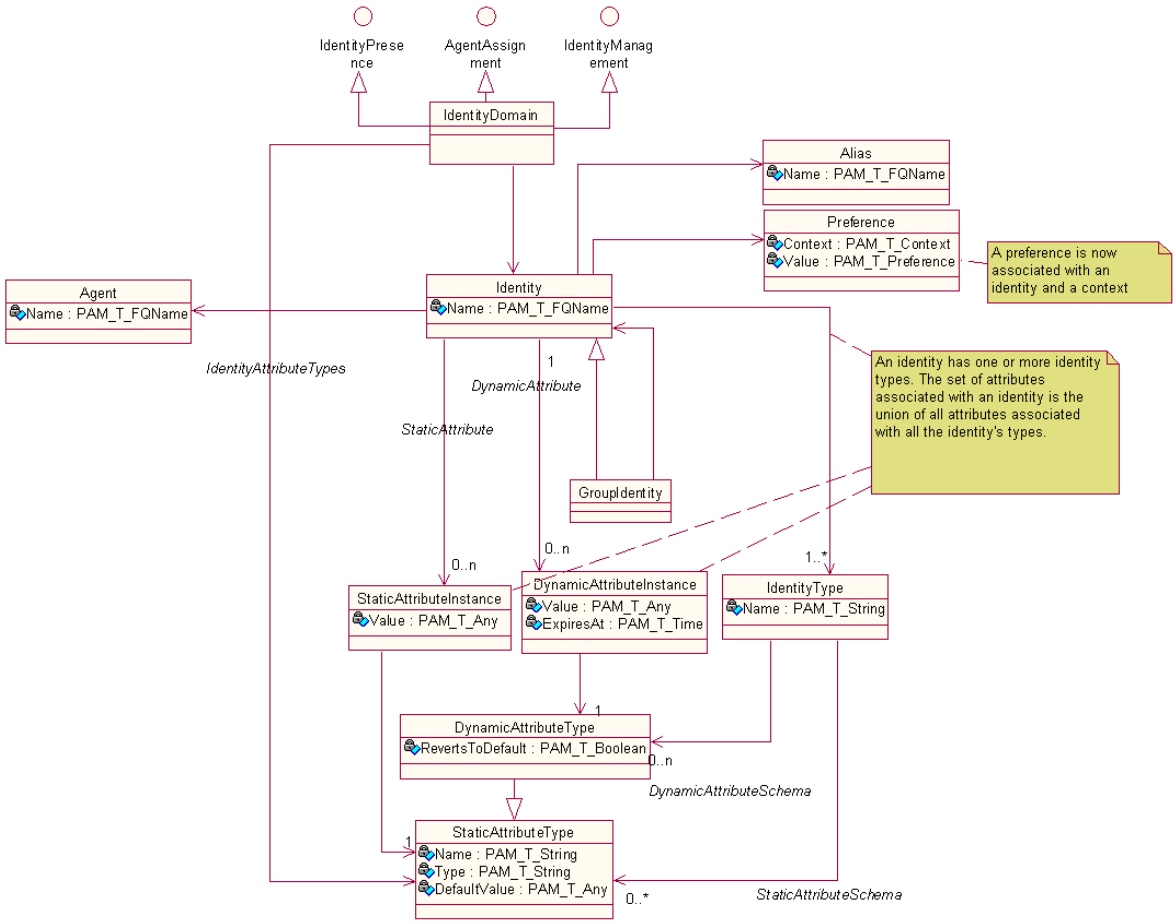
Each exception class contains the following structure:

Structure Element Name	Structure Element Type	Structure Element Description
ExtraInformation	TpString	Carries extra information to help identify the source of the exception, e.g. a parameter name.

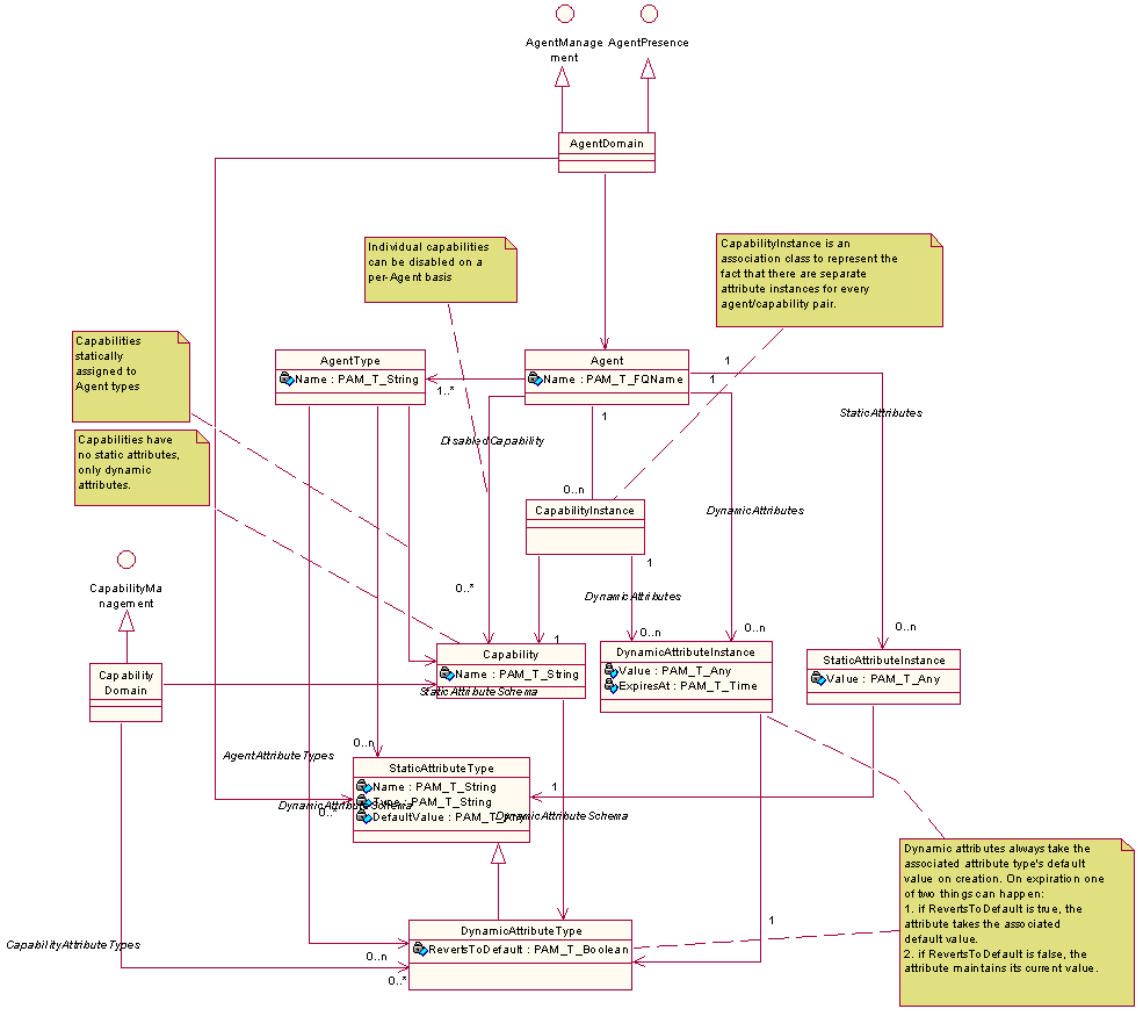
Annex A (informative): Further PAM Information

A.1 UML Models

A.1.1 Identity



A.1.2 Agent



A.2 Model

This clause describes a suggested model for Presence and Availability Management that has influenced the design of the specifications. The model embodies assumptions about the architecture in typical usage, the security and privacy issues, the types of clients or applications that will access PAM implementations, and the framework in which they do so.

Presence and Availability Management has dual roles. In one role, it acts as an abstraction layer (figure A.1) that sits between

- The end-users who will manage their communication identities and availability,
- The communication services that will behave according to the wishes of the end-user, and
- The communication networks to which the end-user's devices are attached and from which their status is to be obtained or inferred.

Here the goal is to "keep the end-user in the loop" i.e., to let the end-users manage their communication services as much as the service providers manage their subscribers. This role primarily determines the functionality of the specifications.

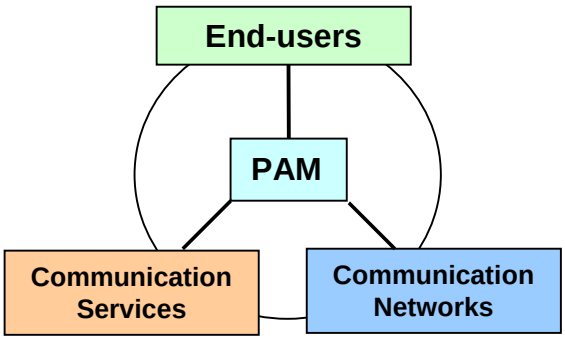


Figure A.1: "Keeping end-users in the loop"

In the second role, Presence and Availability Management provides the means for multiple administrative domains to share information about identity, presence and availability in controlled ways (figure A.2). This sharing may occur for the purposes of allowing communications between end-users in multiple domains and/or for the purposes of allowing the information to be federated into a merged global address space. In either case, this role determines the security and privacy aspects of the specification design.

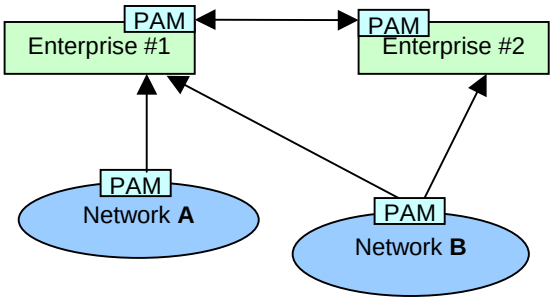


Figure A.2: Information sharing via PAM interfaces

A.3 Architecture

There are several architectural scenarios for use of PAM depending on the participants being legacy systems or future systems or a combination of both. The least intrusive use of PAM is through an implementation of an abstraction layer over existing legacy systems to allow some limited management control for the end-user (figure A.3). The limited benefits come from being able to use third-party end-user management software written for the standard specification. The legacy systems themselves are unaware of the PAM layer. Example applications include number translation schemes in telephony systems enhanced through PAM interfaces, LDAP enabled e-mail systems extended through PAM layer to provide dynamic and/or customized address information, etc.

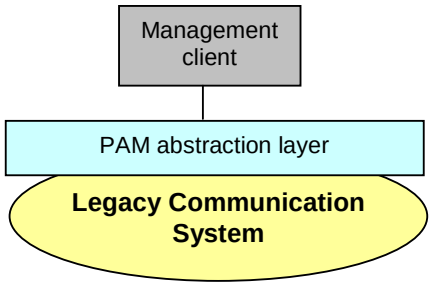


Figure A.3: Abstraction over legacy systems

The next level of adoption comes from communication services or networks that already have some notion of identity, presence and/or availability, exporting this information through the PAM interface (figure A.4). This allows third-party end-user management software written for the standard specification to manage across multiple communication systems on behalf of the user. As the communication services are already designed to take some of these notions into account, the end-user is able to customize the services to a larger extent than the previous scenario. Example applications include Instant Messaging, Email, etc.

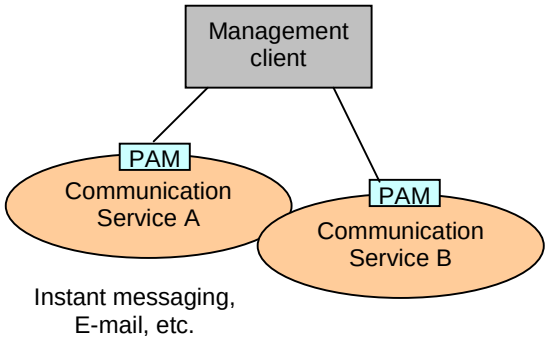


Figure A.4: Exporting from communication services

Maximum benefits from Presence and Availability Management comes in a scenario (figure A.5) in which

- Communication networks export relevant information and device status through PAM interface,
- Communication services are written to consult PAM servers to affect communication handling, and
- End-user management systems written to PAM specifications allow end-users to specify policies and preferences for their communication capabilities.
- Any of the communication services (voice telephony, fax, e-mail, instant messaging, etc.) can potentially use this architecture.

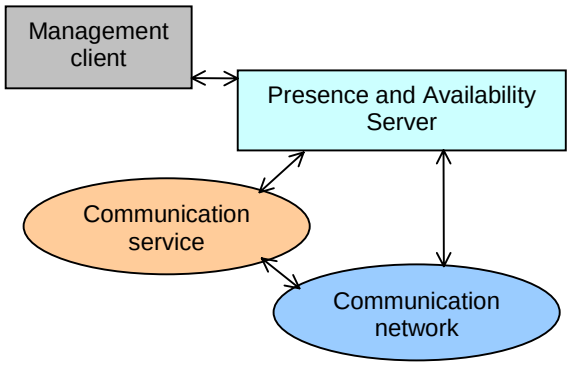


Figure A.5: PAM enabled communications

A.4 Levels of access

As described in earlier clauses, the Presence and Availability Management platform can be used for a variety of purposes including

- Third-party communication management software for end-users.
- Single-point administration software for enterprises.
- Federating namespaces across multiple communication services and networks.

- Exporting enterprise-managed identity, presence and/or availability data for use by external communication services/devices.
- Exporting status and/or location data of devices from networks for use by communication services.

Not all methods in every interface are likely to be used in every context. For example, a simple communication device such as an instant messaging client can check for availability of an end-user using the availability interface but may not need the preference management methods. Communication management software for the end-user may manage the preferences for the user but would not require the user identity creation methods. Enterprise administration software or services installed on top of the platform may require access to all the methods in every interface.

While the interfaces defined in the present document are a minimal union of all the potential types of accesses, it is useful to recognize three categories of platform access primarily differentiated by the authentication and security requirements as described below. Unlike other OSA specifications, PAM specification does not partition the methods and interfaces into views for each type of access. Platform implementations that implement the access framework or define the access protocols are encouraged to define views for the three types of accesses and decide on the subset of methods supported in each view. PAM specification does not require that every method be supported in implementations. Consequently, software written for the platform must take into account the possibility that any method may return with a "not supported" status.

Briefly described below are the characteristics of the three major levels of accesses:

A.4.1 Application

Applications are independent, stand-alone software systems that access PAM implementations on a continuous basis possibly on behalf of multiple clients. Examples include PAM-compliant gateways, switches, messaging servers, address translation systems, enterprise management systems, etc. These applications are likely to be "always-on" and must be allowed to authenticate themselves only at startup of the applications. The applications are typically expected to be non-trivial and running on computing platforms that allow for heavyweight frameworks such as CORBA to be used for access to the interfaces.

A.4.2 Service

Services are software modules that extend or provide additional functionality to PAM implementations. They may run in the same process space as the PAM platform or may run remotely. It is up to the implementations to provide implementation-specific mechanisms for adding, using or managing such services. Examples of services include "buddy list" systems, identity authentication systems, etc.

A.4.3 Thin client

Independent software differentiated from applications in being relatively lightweight and potentially running on devices with minimal computing capabilities such as cellular phones or palm devices. The use of the PAM implementation by a thin client is expected to be infrequent and transitory. Consequently, authentication, when required, may need to happen as often as an individual method access. The PAM implementations need to provide lightweight, preferably message based access for such clients. The thin client access may not be limited to checks for presence and/or availability alone. They may provide some limited end-user preference management capabilities as well.

A.5 Use cases

This clause gives some illustrative use cases of the different interfaces in the present document. This list is not meant to be an exhaustive listing of all the possible use cases but rather an aid in understanding possible uses of the PAM interfaces.

A.5.1 Identity Management

1) Create an identity for John Smith (identity name) of type subscriber (identity type) with the following address information (a specific named profile for addresses).
2) Delete the identity for John Smith
3) Create an alias of Jsmith@company.com under the namespace of "myISP" (namespace created by the ISP with whom John has an account)
4) Delete the alias of Jsmith@company.com for John Smith
5) Create a group named "Project Manhattan" (group identity name) of type projects (identity type) with the following people in it – John, ... (group members)
6) Delete the group called "Project Manhattan"
7) Add John Smith to "Project Manhattan" Group
8) Remove John Smith from "Project Manhattan" Group
9) Is there a John Smith in the default namespace?
10) What is the address information for John Smith?
11) What are John Smith's aliases?
12) What groups does John Smith belong to?
13) Whose alias is Jsmith@myISP.com under the name space of "myISP"?
14) Who are the members of "Project Manhattan"?

A.5.2 Agent Management

1) Create an agent of type "mobile phone" with the ID 123456789 (agent name) and the following capabilities - WAP, Voice, SMS
2) Delete the agent with the ID 123456789
3) Add the capability "video conferencing" to the agent with id 123456789
4) Disable the capability "WAP" for the agent with id 123456789
5) Associate the agent with ID 123456789 with the agent type "GSM phone".
6) Is there an agent with ID 123456789?
7) What agent types are associated with the agent ID 123456789?
8) What is Agent with ID 123456789 capable of?
9) Is Agent with ID 123456789 capable of SMS?

A.5.3 Agent Assignment

10) John Smith now has the phone with ID 123456789

11) John Smith no longer has the phone with ID 123456789

12) What agents does John Smith have for instant messaging (capability)?

13) Is John Smith able to receive instant messages (capability)?

14) What all means can John Smith be communicated with?

15) Who is currently assigned to the phone with ID 123456789?

A.5.4 Agent Presence

16) Set agent status information (dynamic attributes) for mobile phone 123456789 for Instant Messaging with the following location information valid until removed.

17) Set the expiration time for the location information (dynamic attribute) for mobile phone 123456789

18) Update status information (a specific presence profile) of mobile phone 123456789 for Instant Messaging.

19) What is the call status of phone 123456789 for voice calls?

20) What is the location information about phone 123456789 for SMS?

21) What is the motion information of phone 123456789 for SMS?

A.5.5 Identity Presence

22) Set status information for John Smith for Instant Messaging valid until removed.

23) Set call status information of John Smith for voice calls.

24) Set location information of John Smith for Instant Messaging.

25) What is the call status of John Smith for voice calls?

26) What is the location information about John Smith for SMS?

27) What is the motion information of John Smith for SMS?

A.5.6 Availability

28) Store these preferences for John Smith for his voice calls.

29) Delete John Smith's preferences for voice calls.

30) What are John Smith's preferences for voice calls?

31) Is John Smith available to talk to Jane Doe on the phone?

32) How can Jane Doe contact John Smith via Instant Messaging?

33) What is John Smith's location information for Jane Doe?

Annex B (normative): OMG IDL Description of Presence and Availability Management SCF

The OMG IDL representation of this interface specification is contained in a text file (pam.idl contained in archive es_20291514v010101m0.ZIP) which accompanies the present document.

Annex C (informative): Java API Description of the Presence and Availability Management SCFs

The Java API representation of this interface specification can be obtained from the following URL:

- JAIN Presence and Availability Management (http://jcp.org/jsr/detail/123.jsp)

Each JSR webpage contains a table identifying the relationships between the different versions of the Parlay, ETSI/OSA, 3GPP/OSA and JAIN SPA specifications. In addition, each JAIN SPA specification version indicates to which Parlay, ETSI/OSA and 3GPP/OSA specification versions it corresponds to.

Annex D (informative): Contents of 3GPP OSA R5 Presence and Availability Management

The Presence and Availability SCF (minus interface IpPAMAgentPresence) and the Event Management SCF are relevant for TS 129 198-14 V5 (Release 5).

Annex E (informative): Record of changes

The following is a list of the changes made to the present document for each release. The list contains the names of all changed, deprecated, added or removed items in the specifications and not the actual changes. Any type of change information that is important to the reader is put in the final clause of this annex.

Changes are specified as changes to the prior major release, but every minor release will have its own part of the table allowing the reader to know when the actual change was made.

E.1 Interfaces

E.1.1 New

Identifier	Comments
Interfaces added in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.1.2 Deprecated

Identifier	Comments
Interfaces deprecated in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.1.3 Removed

Identifier	Comments
Interfaces removed in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.2 Methods

E.2.1 New

Identifier	Comments
Methods added in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.2.2 Deprecated

Identifier	Comments
Methods deprecated in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.2.3 Modified

Identifier	Comments
Methods modified in ES 202 915-14 version 1.1.1 (Parlay 4.0)	
IpAppPAMEventHandler.eventNotify	TpAssignmentID changed to TpPAMEventID
IpAppPAMEventHandler.eventNotifyErr	TpAssignmentID changed to TpPAMEventID
IpPAMEventHandler.isRegistered	TpAssignmentID changed to TpPAMClientID
IpPAMEventHandler.registerAppInterface	returns TpPAMClientID
IpPAMEventHandler.registerForEvent	returns TpPAMEventID, clientID type changed to TpPAMClientID
IpPAMEventHandler.deregisterAppInterface	TpAssignmentID changed to TpPAMClientID
IpPAMEventHandler.deregisterFromEvent	TpAssignmentID changed to TpPAMEventID

E.2.4 Removed

Identifier	Comments
Methods removed in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.3 Data Definitions

E.3.1 New

Identifier	Comments
Data Definitions added in ES 202 915-14 version 1.1.1 (Parlay 4.0)	
TpPAMClientID	
TpPAMEventID	

E.3.2 Modified

Identifier	Comments
Data Definitions modified in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.3.3 `Removed

Identifier	Comments
Data Definitions removed in ES 202 915-14 version 1.1.1 (Parlay 4.0)	
TpPAMTime	Not Used

E.4 Service Properties

E.4.1 New

Identifier	Comments
Service Properties added in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.4.2 Deprecated

Identifier	Comments
Service Properties deprecated in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.4.3 Modified

Identifier	Comments
Service Properties modified in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.4.4 Removed

Identifier	Comments
Service Properties removed in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.5 Exceptions

E.5.1 New

Identifier	Comments
Exceptions added in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.5.2 Modified

Identifier	Comments
Exceptions modified in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.5.3 Removed

Identifier	Comments
Exceptions removed in ES 202 915-14 version 1.1.1 (Parlay 4.0)	

E.6 Others

History

Document history			
V1.1.1	November 2002	Membership Approval Procedure	MV 20030117: 2002-11-19 to 2003-01-17