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Open Service Access (OSA); Application Programming Interface (API); Part 14: Presence and Availability Management SCF (Parlay 6)

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Foreword

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

The present document is part 14 of a multi-part deliverable covering Open Service Access (OSA); Application Programming Interface (API), as identified below. The API specification (ES 204 915) 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";

Part 15: "Multi-Media Messaging SCF";

Part 16: "Service Broker SCF".

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The present document forms part of the Parlay 6.0 set of specifications.

A subset of the present document is in 3GPP TS 29.198-14 V7.0.0 (Release 7).

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).

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2 References

The references listed in clause 2 of ES 204 915-1 contain provisions which, through reference in this text, constitute provisions of the present document.

ETSI ES 204 915-1: "Open Service Access (OSA); Application Programming Interface (API); Part 1: Overview (Parlay 6)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 204 915-1 apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ES 204 915-1 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.

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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.

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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.

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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.