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1. **Scope**

This document provides the architecture for the DANE V1.0 Enabler. This architecture is based on the requirements as listed in the DANE Requirement Document [DANE-RD].
2. References

2.1 Normative References


[DANE-RD] “DANE Requirements”, Open Mobile Alliance™, OMA-RD-DANE-V1_0-20130425-D.doc, URL: http://www.openmobilealliance.org/


2.2 Informative References

3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Device App</td>
<td>An application running on the device that uses device/network resources</td>
</tr>
<tr>
<td>Device Service Optimizer</td>
<td>An entity residing in the device, managing the interaction between Device Apps and device/network resources</td>
</tr>
<tr>
<td>PCRF</td>
<td>See [3GPP TS 23.203]</td>
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3.3 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>3GPP</td>
<td>3rd Generation Partnership Project</td>
</tr>
<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>App</td>
<td>Application</td>
</tr>
<tr>
<td>DM</td>
<td>Device Management</td>
</tr>
<tr>
<td>DSO</td>
<td>Device Service Optimizer</td>
</tr>
<tr>
<td>E-UTRAN</td>
<td>Evolved Universal Terrestrial Radio Access Network</td>
</tr>
<tr>
<td>GBR</td>
<td>Guaranteed Bit Rate</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>OMA</td>
<td>Open Mobile Alliance</td>
</tr>
<tr>
<td>PCRF</td>
<td>Policy and Charging Rules Function</td>
</tr>
<tr>
<td>QCI</td>
<td>QoS Class Identifier</td>
</tr>
<tr>
<td>QoE</td>
<td>Quality of Experience</td>
</tr>
<tr>
<td>QoS</td>
<td>Quality of Service</td>
</tr>
<tr>
<td>RN_API</td>
<td>Apps Registration and Events Notification API</td>
</tr>
<tr>
<td>TCP</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
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<tr>
<td>WI-FI</td>
<td>Wireless Fidelity</td>
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4. Introduction

This document defines the architecture of the DANE Enabler based on the DANE Requirements Document [DANE-RD].

The focus of the DANE V1.0 is the standardization of the DSO entity, in terms of the interfaces towards, on one side, Device Apps and, on the other side, Wireless Network Policy Manager.

In this context, this Architecture Document defines any needed functional components and interfaces.

4.1 Version 1.0

This architecture document covers the requirements of DANE V1.0 [DANE-RD].

The document aims to cover architectural aspects related to the interfaces for the following areas:

- Registration of Device Apps to DSO (Device Apps requests for particular QoS levels)
- Notification of events from DSO to registered Device Apps
- Interaction between the DSO and Wireless Network Policy Manager
5. Architectural Model

The DANE architecture supports all function as specified in [DANE-RD].

Following sections will describe DANE architecture diagram, functional components and interfaces.

5.1 Dependencies

There are no dependencies.

5.2 Architectural Diagram

![DANE Architectural Diagram](image-url)

Figure 1: DANE Architectural Diagram
5.3 Functional Components and Interfaces

5.3.1 DANE Enabler Functional Components

5.3.1.1 Device Service Optimizer

The Device Service Optimizer (DSO) is a functional component within DANE V1.0 enabler which is responsible for:

- receiving and managing Device Apps registration requests (through DANE-1), for specific QoS levels
- detecting whether or not the Device has, with the Wireless Network, an already established bearer that could support the QoS level requested by the Device Apps
- initiation of bearer establishment by interacting with Wireless Network Policy Manager for the requested QoS
- notifying back the registered Device Apps about the occurrence of particular Events (e.g. decreased actual QoS level)

5.3.1.2 Entities external to the DANE enabler (Informative)

Device App
A native or web-based App running on the Device and able to ask DSO for a certain QoS level (through DANE-1 interface).

Wireless Network Policy Manager
The entity responsible for QoS policy definition and activation in a certain Wireless Network.
In the case of 3GPP Wireless Network, the Policy Manager typically would be the PCRF.

5.3.2 Interfaces

5.3.2.1 DANE-1

This interface exposed by DSO and used by Device Apps.
This interface is used by Device Apps to request registration for a certain QoS level (the registration can be for all the IP flows handled by the App or only for some of them).
Through this interface Device Apps registered to DSO also receive Event Notifications (e.g. decreased actual QoS level) in response to specific requests.

5.3.2.2 Ext-1 (Informative)

This interface is used by DSO shall be able to initiate bearer establishment with Wireless Network Policy Manager receive from the DSO the requests for the establishment of bearers for a specific with a certain QoS level.
The example of Ext-1 could be OMA RESTful QoS API exposed by the PCRF over the Rx interface.

5.4 Security Considerations

The security considerations described in this section apply to any DANE enabler implementation, and these considerations may result in different deployment models. Any particular security mechanism relevant to DANE enabler is addressed in the [DANE-TS].

Any deployment of DANE enabler needs to ensure that all the applications exploiting DANE-1 interface are authenticated and authorized.
5.5 Charging Considerations

Not applicable.
Appendix A. Change History

### A.1 Approved Version History

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### A.2 Draft/Candidate Version V1.0 History

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<td>Incorporates agreed CR: OMA-CD-DANE-2013-0008R01-CR_External_Interface_in_Architectural_Diagram</td>
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