



**Publicly Available Specification (PAS);
Intelligent Transport Systems (ITS);
MirrorLink[®];
Part 22: Android Specific Specifications enabling
AIDL-based MirrorLink[®] Applications**

CAUTION

The present document has been submitted to ETSI as a PAS produced by CCC and approved by the ETSI Technical Committee Intelligent Transport Systems (ITS).

CCC is owner of the copyright of the document CCC-TS-056 and CCC-TS-065 and/or had all relevant rights and had assigned said rights to ETSI on an "as is basis". Consequently, to the fullest extent permitted by law, ETSI disclaims all warranties whether express, implied, statutory or otherwise including but not limited to merchantability, non-infringement of any intellectual property rights of third parties. No warranty is given about the accuracy and the completeness of the content of the present document.



Reference

DTS/ITS-88-22

Keywords

interface, ITS, PAS, smartphone

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

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (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

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

©ETSI 2017.

© Car Connectivity Consortium 2011-2017.

All rights reserved.

ETSI logo is a Trade Mark of ETSI registered for the benefit of its Members.

MirrorLink® is a registered trademark of Car Connectivity Consortium LLC.

RFB® and VNC® are registered trademarks of RealVNC Ltd.

UPnP® is a registered trademark of UPnP Forum.

Other names or abbreviations used in the present document may be trademarks of their respective owners.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M logo is protected for the benefit of its Members.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	6
3 Abbreviations	7
4 Platform-Specific Specification Concept Overview	7
5 Application Identifier	8
5.1 General	8
5.2 Format	8
5.3 Calculation	8
5.3.1 General.....	8
5.3.2 Shared UIDs.....	10
5.3.3 ROM applications	10
5.4 APK Validation	10
6 Application Information	11
6.1 General	11
6.2 Self-Signed Application Certificates	11
6.2.1 General.....	11
6.2.2 Application Certificate Self-Signing Process.....	11
6.2.3 Self-Signed Application Certificate Installation	11
6.3 Alternative to Self-Signed Application Certificates.....	11
6.4 Particulars of Android Application Certificates	11
6.4.1 General.....	11
6.4.2 Platform version.....	11
6.4.3 Icon URLs.....	12
6.5 Localized strings for the entries in the application certificate	12
7 Development Certificates	12
7.1 General	12
7.2 Device ID	12
7.3 Manual Developer ID Certificate Revocation Checks	13
8 MirrorLink API Implementation	13
8.1 General	13
8.2 API Overview.....	13
8.2.1 General.....	13
8.2.2 Android MirrorLink Server Requirements	14
8.2.3 Application Requirements	15
8.3 MirrorLink API Library Definition	17
8.3.1 Data Type Definitions.....	17
8.3.2 Data Structure Definitions	17
8.3.3 MirrorLink API Elements accessible from the Service	17
8.3.4 MirrorLink API Elements accessible from the Content Provider	18
8.3.4.1 General	18
8.3.4.2 0xF0xx ' MirrorLink API Information mapping	18
8.3.4.3 0x02xx ' Certification Information mapping.....	19
8.3.4.4 0x03xx ' Connection Information mapping.....	19
8.3.4.5 0x0Cxx ' Actions mapping	19
8.3.5 Modules dependencies	20
8.3.5.1 General	20
8.3.5.2 General Android MirrorLink Service access.....	20

8.3.5.3	General Android Content Provider Service access	20
8.3.5.4	Actions Module write access.....	20
8.3.5.5	DataService Module Source Service Access.....	20
8.3.5.6	Launch of Actions	20
8.3.5.7	MirrorLink Actions	21
8.3.6	Context Information Lifetime	22
8.3.7	Return values outside of a MirrorLink session	22
9	MirrorLink Events	22
9.1	General	22
9.2	Touch Events Injections	22
9.3	Key Events Injections.....	22
9.4	Key Event Mapping.....	22
9.5	Virtual Keyboard.....	24
10	Platform Limitations.....	24
10.1	CCC-TS-010-VNC Based Display and Control	24
10.1.1	Server Event Configuration Message	24
10.1.2	Handling of Overlays.....	24
10.1.3	Handling of Applications Seeking Foreground Status	24
10.1.4	Removal of audio from non-certified applications	25
Annex A (informative):	App ID Generation Code	26
Annex B (informative):	Authors and Contributors.....	30
History		31

Intellectual Property Rights

Essential patents

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 (<https://ipr.etsi.org/>).

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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 22 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document is part of the MirrorLink® specification which specifies an interface for enabling remote user interaction of a mobile device via another device. The present document is written having a vehicle head-unit to interact with the mobile device in mind, but it will similarly apply for other devices, which provide a colour display, audio input/output and user input mechanisms.

The present document provides the elements of the MirrorLink specification that apply only to Android MirrorLink Server devices.

The API javadoc files contained in the archive Mirrorlink_API-Level2-AIDL-files.zip, contained in ts_10354422v010300p0.zip, are an integral part of the present document.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are necessary for the application of the present document.

[1] IETF RFC 3281: "An Internet Attribute Certificate Profile for Authorization", April 2002.

NOTE: Available at <http://www.ietf.org/rfc/rfc3281.txt>.

[2] ETSI TS 103 544-14 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 14: Application Certificates".

[3] ETSI TS 103 544-15 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink® ; Part 15: Application Programming Interface (API) Level 1 & 2".

[4] ETSI TS 103 544-16 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 16: Application Developer Certificates".

[5] IETF RFC 4648: "The Base16, Base32, and Base64 Data Encodings", October 2006.

NOTE: Available at <http://www.ietf.org/rfc/rfc4648.txt>.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TS 103 544-1 (V1.3.0): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 1: Connectivity".