
Car Connectivity Consortium

MirrorLink™

Network Information Data Service

Version 1.2.0
(CCC-TS-052)



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1 **VERSION HISTORY**

Version	Date	Comment
1.2.0	25 September 2013	Approved Version

3 **LIST OF CONTRIBUTORS**

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TERMS AND ABBREVIATIONS

AP Access Point

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1 ABOUT

This document specifies Network Information Data Service based on SBP (Service Binary Protocol) framework [3]. The service is used to provide network capabilities and status information of Access Point to Client.

The specification lists a series of requirements, either explicitly or within the text, which are mandatory elements for a compliant solutions. Recommendations are given, to ensure optimal usage and to provide suitable performance. All recommendations are optional.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are following the notation as described in RFC 2119 [1].

1. MUST: This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification.
2. MUST NOT: This phrase, or the phrase "SHALL NOT", mean that the definition is an absolute prohibition of the specification.
3. SHOULD: This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
4. SHOULD NOT: This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
5. MAY: This word, or the adjective "OPTIONAL", means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option MUST be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option MUST be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.)

2 INTRODUCTION

The purpose of Network Information service is to provide network capabilities and status of the Access Point to Client.

When MirrorLink Server and Client are connected through Wi-Fi technology of Wi-Fi Alliance, both the ML Server and the Client can be either an Access Point (AP) or Client. In-vehicle setting, it is important for Client to know network status information of the AP, as network delay on AP may cause poor response time of applications requiring Internet connectivity on Client. MirrorLink Client can select the “best” network interface to be used for the Internet access with regard to network capabilities and the status information of AP. The algorithm for a selection of the network interface for the Internet access on Client is out of scope of this document. Wi-Fi connection established between the ML Server and the Client MUST be maintained while the Client configures its network interfaces to access the Internet.

The following code shows the definition of service:

```
/* com.mirrorlink.networkinfo service, v1.0 */
/** NetworkSupport Object carrying network capabilities of Access Point
    @mandatory
    @UID: to be calculated */
Object NetworkSupport {
    LONG supportedNetworkType;    /// @UID: to be calculated
};

/** NetworkStatus Object carrying current network status of Access Point
    @mandatory
    @UID: to be calculated */
Object NetworkStatus {
    LONG activeNetworkType;    /// @UID: to be calculated
    BYTE connectivityStatus;    /// @UID: to be calculated
    INT signalStrength;    /// @UID: to be calculated
};

/** DataBalanceStatus Object carrying current data balance status of
    Access Point
    @optional
    @UID: to be calculated */
Object DataBalanceStatus {
    BOOL dataRoamingStatus;    /// @UID: to be calculated
    LONG mobileDataLimit;    /// @UID: to be calculated
    LONG mobileDataUsage;    /// @UID: to be calculated
};
```

This service uses the name of “com.mirrorlink.networkinfo” to uniquely identify this service on CDB layer [2].

The service is composed of following Objects:

- **NetworkInfo Object:** This is a network type that Access Point supports. Supporting of this Object is mandatory.
- **NetworkStatus Object:** This Object allows accessing current network status of the Access Point. This Object MUST be supported.
- **DataBalanceStatus Object:** This Object provides current data balance status of the Access Point. Supporting this Object is optional.

3 NETWORKINFO OBJECT

NetworkSupport Object returns network types that Access Point supports.

Following table gives further explanation about member variables defined:

Name	Data type	Description
supportedNetworkType	LONG	<p>Bit wise OR of all supported Network Types</p> <ul style="list-style-type: none"> 0x0000 0000 0000 0001: GSM 0x0000 0000 0000 0002: GPRS 0x0000 0000 0000 0004: EDGE 0x0000 0000 0000 0100: UMTS 0x0000 0000 0000 0200: HSDPA 0x0000 0000 0000 0400: HSUPA 0x0000 0000 0000 0800: HSPA+ 0x0000 0000 0001 0000: EV-DO 0x0000 0000 0002 0000: 1xRTT 0x0000 0001 0000 0000: LTE 0x0000 0002 0000 0000: WiMAX 0x0001 0000 0000 0000: Others <p>A zero value indicates that there is no network support for head-unit connectivity.</p>

NetworkStatus Object returns the current network status information directly. If the current network information is not available, Server MUST return "Not available" error code. This applies to the case when the NetworkInfo Object is subscribed. Following table gives further explanation about member variables defined:

Name	Data type	Description
activeNetworkType	LONG	<p>Current network type being used.</p> <p>Value defined in the table above.</p>
connectivityStatus	BYTE	<p>High-level status information of the active network. The value should be one among</p> <ul style="list-style-type: none"> 0x01: active and tethering enabled 0x02: active but tethering disabled 0x03: inactive, and 0x04: disabled
signalStrength	INT	<p>Signal strength of the active network. The value should be one among</p> <ul style="list-style-type: none"> 0: No signal 1: Weakest signal 2: Weak signal 3: Medium signal 4: Strong signal 5: Strongest signal

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2 **NetworkStatus** Object can be accessed by using Subscribe or Get command. In case of changing any
3 variables of the Object, Server MUST send a new notification.

4 **DataBalanceStatus** Object returns the current data balance information of the Access Point. Data-
5 **BalanceStatus** composes of member variables described in the table as follows:

Name	Data type	Description
dataRoamingStatus	BOOLEAN	Roaming status of Access Point. <ul style="list-style-type: none">• True: Access Point is in roaming mode.• False: Access Point is not in roaming mode.
mobileDataLimit	LONG	Mobile data limit. The unit is Byte. <ul style="list-style-type: none">• A zero value indicates mobile data is unlimited.
mobileDataUsage	LONG	Amount of mobile data used during the data usage cycle. The unit is Byte.

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4 IMPLEMENTATION CONFIGURATIONS

The Client SHOULD first Get `NetworkSupport` Object, and then it SHOULD subscribe `NetworkStatus` Object. The server MUST NOT provide `DataBalanceStatus` Object if required information is not available or not accurate. For instance, data balance or data usage information is valid only if a user inputs a billing cycle of the data plan on the Server device.

Approved

5 REFERENCES

- [1] IETF, RFC 2119, Keys words for use in RFCs to Indicate Requirement Levels, March 1997.
<http://www.ietf.org/rfc/rfc2119.txt>
- [2] Car Connectivity Consortium, “MirrorLink – Device Attestation”, Version 1.1, CCC-TS-014
- [3] Car Connectivity Consortium, “MirrorLink – Service Binary Protocol”, Version 1.1; CCC-TS-018

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