S02P02-Time - v2.2.0

(Redirected from S02P02-Time)

📒 **Table of content**: To display the headings in the side bar, check this short video.

📄 **PDF export**: To create a PDF, use `Ctrl+P` and select "Save as PDF".

📌 **Be aware!** Some technical requirements are mandatory to comply with ITxPT architecture. Read the Modal verbs terminology page to fully understand the meaning of the modal verbs used in the specification and to identify the mandatory requirements.

Modal verbs

M This icon indicates mandatory technical requirements in the document. **Mandatory** technical requirements are the **minimum features** to implement ITxPT architecture and ensure interoperability on a technical level. Note that mandatory requirements apply to optional features if they are implemented. Each operational implementation may request optional requirements to fulfil its functional design beyond the minimum mandatory technical requirements.

Dictionary

Browse the ITxPT Dictionary page or Category to find **definitions** of generic terms not included in the specification. You can also search the ITxPT Wiki using the Search bar on top bar menu.

1 Definitions

Term	Definition
DNS	Domain Name System
DNS-SD	DNS-based Service Discovery
mDNS	multicast Domain Name System
SNTP	Simple Network Time Protocol
SRV record	DNS Service record
TTL	Time To Live
TXT record	DNS Text record
UDP	User Datagram Protocol
UTC time	Coordinated Universal Time

2 Description and use cases

The time service **shall** undertake two responsibilities:

1. To obtain the correct time from a suitable time source, and
2. To deliver the time via the SNTP protocol based on RFC5905.

The time source used for responsibility 1 **shall** be either via the NTP or SNTP protocol, or if that is unavailable, it **shall** use the time delivered by a local GNSS location service (if delivered in GNSS Data or Date and Time elements). If no time are delivered by GNSS and no NTP/SNTP server reachable the time service **shall** not be announced.

The time service **shall not** start delivering the time according to responsibility 2 until it has obtained the correct time.

The time service **shall** deliver time in UTC format only, to avoid any issues with time zone management.

All onboard network modules **shall** use the same UTC time to ensure coherence between their data.

If in a given installation there is more than one potential supplier of the TIME service, then steps **shall** be taken to ensure that only one service is active at the same time.

3 Transport Protocol

The Time Service provides its information via the **UDP protocol (unicast)**.

The service provides its data via UDP. In particular retransmission of lost packages is considered as unnecessary since the data are valid for a second anyway.

4 Service Publication

4.1 Published Service Name

The service name of the Time Service is:

- **time**

4.2 SRV record

The SRV record of theTime Service looks as follows:

```
<UniqueIdentifier>_<Name>._<Type>._<Protocol>.<Domain>
      TTL class SRV priority weight port target
```

Field	Definition	Value
UniqueIdentifier	Network unique identifier to avoid conflicts with ambiguous names It can be an arbitrary distinct number, the host name, the serial number, etc. It shall not contain the character "_"	[UniqueIdentifier]
Name	Functional (application) description of the service	time
Type	Application protocol name (can be http, sntp…)	sntp
Protocol	the transport protocol name of the service (tcp or udp)	udp
Domain	domain name for which this record is valid	local
TTL	standard DNS time to live field	120
Class	standard DNS class field (always "IN" for Internet)	IN
"SRV"		SRV
Priority	priority of the target host, lower value means more preferred	0 (configurable)
Weight	relative weight for records with same priority, higher = more preferred	0 (configurable)
Port	Recommended TCP or UDP port on which the service is to be found	123
Target	canonical hostname of machine providing the service	[hostname]

Table 1 -Time service SRV record

As a result, SRV record of Time Service is:

```
[UniqueIdentifier]_time._sntp._udp.local 120 IN SRV 0 0 123 [hostname]
```

4.3 TXT record

The TXT record of the Time Service looks as follows:

```
[UniqueIdentifier]_time._sntp._udp.localTTL class TXT name=value
```

Attribute Name	Mandatory / Optional	Type	Description	Expected value / example
txtvers	**Mandatory**	integer	Recommended key for version of TXT record, default 1	**txtvers=1**
version	**Mandatory**	string	version of therelated ITxPT specification release for this service	**version=2.2.0**
release	**Mandatory**	string	The ITxPT named release	release=Linden
manufacturer	**Mandatory**	string	The name of the manufacturer of the service	manufacturer=ClearDisplays
swvers	**Mandatory**	string	Version of the supplier's implementation of this service	swvers=1.3.4
sntp-host	Optional	string	IP address of SNTP server (if not the host of time service)	sntp-host=192.168.127.3
timezone	Optional	string	Local offset of vehicle (relative to UTC distributed by SNTP): UTC+HH:MM If no offset is set/wanted, skip attribute, or use "timezone=" This value includes the DST.	timezone=UTC+01:30
interval	**Mandatory**	integer	Expected update and validation frequence of the provided information in the record. Range: 1-30 minutes	interval=10

Table 2 -Time service TXT record

As an example, TXT record of Time Service is:

```
mydevice-2387561_time._sntp._udp.local 4500 IN TXT txtvers=1 version=2.2.0 release=Linden manufacturer=ClearDisplays swvers=1.3.4 sntp-host=192.168.127.3
timezone=UTC+01:30 atdatetime=2024-08-13T14:22:11Z interval=10
```

5 Structure of the service

5.1 Overview of operations

The Time Service doesn't support any operations. The SNTP time server shall be hosted on the vehicle local network.

5.2 Detailed Description of operations and data structures

Time Service does not support any data structure, other than defined in RFC 5905.

History

Document history		
V2.2.0	October 2024	▪ Added to TXT record – release, manufacturer, atdatetime, interval ▪ Added new mandatory items to example of TXT record ▪ Removed faulty double quotation marks in txt example ▪ Added text describing expected behaviour and redundancy.