TCN Open

Open Source Developement

TRDP

Train Real Time Data Protocol

TRDP 1.0.0.0 Release Notes

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Dissemination Level			
PU	Public		X
PP	Restricted to other programme participants (including the Commission Services)		
RE	Restricted to a group specified by the consortium (including the Commission Services)		
CO	Confidential, only for members of the consortium (including the Commission Services)		

Participants

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History

V1	27 May 13	Armin-H. Weiss	Initial version

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1. Introduction

1.1. Purpose

This document is the Release Notes for the Bombardier* Release of TCNOpen* TRDP* Version 1.0.0.0 as implementation of the communication profile defined in IEC61375-2-3.

1.2. Intended Audience

The audience of this document and the users of the release are software engineers that want to adapt or to use TCNOpen* TRDP* as implementation of the communication profile defined in IEC61375-2-3.

1.3. References/Related Documents

Reference	Number	Title
[Wire]	IEC61375-2-3	TRDP Protocol (Annex A)
[TestRep]	TCN-TRDP1-D-BOM-032	TRDP Conformance Test Report
[UserMan]	TCN-TRDP2-D-BOM-011	TRDP User's Manual
[RefMan]	TCN-TRDP2-D-BOM-033	TRDP Reference Manual

Table 1: References

1.4. Abbreviations and Definitions

Abbreviation	Definition
PD	"Process Data" Part of the in [Wire] defined communication protocol used for cyclic data transmissions based on UDP protocol.
UDP-MD	"UDP Message Data" Part of the in [Wire] defined communication protocol used for event driven data transmissions based on UDP protocol.
TCP-MD	"UDP Message Data" Part of the in [Wire] defined communication protocol used for event driven data transmissions based on TCP protocol.
ETBN	Ethernet Train Backbone Node

Table 2: Abbreviations and Definitions

2. Product Definition

2.1. General Description

The TCNOpen TRDP is an open source implementation of communication profile described in [Wire] and includes compiled libraries for primary targets and source code to be used for other platforms as well as examples for reference implementation.

TCNOpen TRDP includes:

- TRDPLight (the communication protocol stack for PD, UDP-MD and TCP-MD)
- TRDP Marshall – a service for marshalling/unmarshalling TRDP user data
- TRDP XML – a service for reading TCNOpen TRDP XML configuration files
- TRDP SPY – a wireshark plugin to interprete TRDP telegrams

It does not yet include:

- TRDP LADDER – ladder support acc. to IEC61375-3-4
- TRDP TTI – a service to access the train topology information data base of the ETBN
- TRDP SDT – a service for safe data transmission according to the definition in [Wire]
- TRDP ADR – a service for IP-URI address translation
- TRDP SDL – a service for SW download support
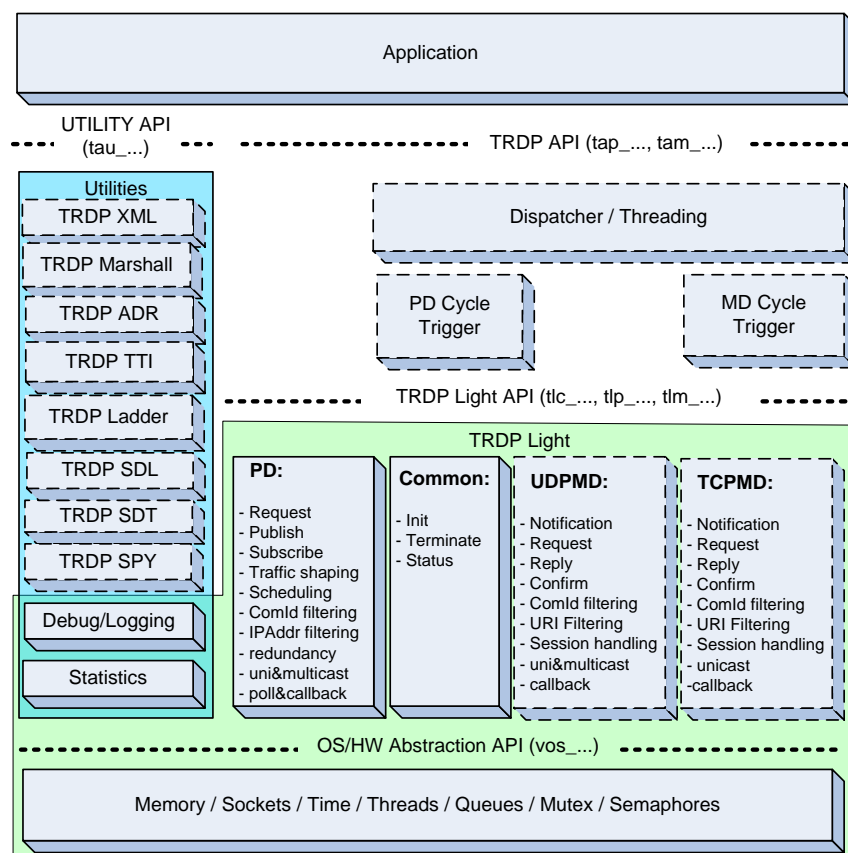
Figure 1 TRDP Modular Structure

2.2. Product Identification

TCNOpen TRDP 1.0.0.0 (SVN 0857) contains the following parts identified by the following identification numbers:

Abbreviation	Identification	Remark
TRDPLight		
TRDPMarshall		
TRDPXML		Win32
TRDPSpy		Win32 and Linux
~~TRDPLadder~~		
~~TRDPADR~~		
~~TRDPTTI~~		
~~TRDPSDL~~		
~~TRDPSDT~~		

Table 3: Product Identifications

2.3. Targets

2.3.1. Primary Targets

TCNOpen TRDP is provided for a set of primary targets. Outputs for these have been verified during the release process.

Target	Use	OS	CPU-HW
Linux PC	General	Linux 32	x86
Windows PC	General	Windows XP	x86
MAC	General	MacOS	x86

Table 4: Primary Targets

2.3.2. Secondary Targets

TCNOpen TRDP is also delivered as an SDK with source code and example makefiles only. The makefiles serve as examples for building the binaries for different platforms and can be used as a template for specific platform builds. The following table shows the builds which have not been tested but have been taken care of within the source code.

Target	Use	OS	CPU-HW
Windows PC	General	Windows7 32	x86

Table 5: Secondary Targets

3. Delivery

3.1. Platform

Target	File	Description
Linux PC, Windows PC, MAC		Version 1.0.0.0 does not include ready compiled libraries and DLL but source code and build environments.

Table 6: Platform Delivery Content TRDPLight

Target	File	Description
Linux PC, Windows PC, MAC		Version 1.0.0.0 does not include ready compiled libraries and DLL but source code and build environments.

Table 7: Platform Delivery Content TRDPMarshall

Target	File	Description
Linux PC, Windows PC, MAC		Version 1.0.0.0 does not include ready compiled libraries and DLL but source code and build environments.

Table 8: Platform Delivery Content TRDPXML

Target	File	Description
Linux32	..\spy\linux32\packet-trdp_spy.so	Linux32 Wireshark plugin
WindowsXP	..\spy\linux32\trdp_spy.dll	Win32 Wireshark plugin
WindowsXP	..\spy\win32\libxml2.dll	Resources for Win32 Wireshark plugin
WindowsXP	..\spy\win32\iconv.dll	Resources for Win32 Wireshark plugin
WindowsXP	..\spy\win32\readme.txt	Readme for Win32 Wireshark plugin

Table 9: Platform Delivery Content TRDPSpy

3.2. SDK

To also support other targets than the platform does, TCNOpen TRDP is delivered as an SDK (Software Development Kit). The release is enclosed in the archive file "TCNOpenTRDP-SRC 1.0.0.0.zip". This comprises items according to the tables below using the following file structure:

DirLevel1	DirLevel2	DirLevel3	Description
config			XML configuration structure and build environment configurations
doc			Documentation
resources			Open source resources used within TRDP
	posix		
	windows		
		getopt	getopt functionality for test programs
		iconv	XML Parser functionality
		libxml	XML parser functionality
		pthread	Posix threads for vos functionality
		wireshark	Wireshark win32 1.8.3
src			TRDP source code
	api		TRDP API header files
	common		TRDP source code files
	example		TRDP example application files
	vos		VOS source code and header files
		api	VOS API header files
		common	VOS target independing source code files
		posix	VOS POSIX depending source code files
		vxworks	VOS VXWORKS depending source code files
		windows	VOS WIN32 depending source code files
spy			Wireshark plugin for TRDP
	doc		Documentation
	src		Source code for wireshark plugin
	linux32		Plugin for Linux32
	win32		Plugin for Win32
test			
	diverse		Test diverse functions of the library
	laddermdtest		Test of the TRDP ladder MD functionality
	ladderpdtest		Test of the TRDP ladder MD functionality
	lint		PCLint profile for Windows
	marshalling		Test of marshalling/un-marshalling
	mdpatterns		Test of the TRDP MD patterns
	pdpatterns		Test of the TRDP PD patterns
	udpmdcom		Test of the UDP MD communication

DirLevel1	DirLevel2	DirLevel3	Description
	xml		Test of the TRDP XML configuration
example			Examples for TRDP use
VisualC			VisualC 2010 configuration for TRDP library and related test examples
XCode			Xcode configuration for TRDP library and related test examples

Table 10: SDK Delivery Directory Structure

3.2.1. TRDPLight

The TRDPLight contains the base functionality for PD, UDP-MD and TCP-MD.

File	Description
..\src\api\trdp_proto.h	TRDP protocol definitions
..\src\api\trdp_types.h	TRDP type definitions
..\src\api\trdp_if_light.h	TRDP light API definitions
..\src\api\tau_addr.h	URI/IP address translation support (not yet implemented)
..\src\api\tau_tti.h	Train topology information support (not yet implemented)
..\src\common\trdp_if.c	TRDP light API
..\src\common\trdp_if.h	TRDP light API internal definitions
..\src\common\trdp_dllmain.c	TRDP light Windows DLL stub
..\src\common\trdp_mdcom.c	TRDP light MD functionality
..\src\common\trdp_mdcom.h	TRDP light MD functionality definitions
..\src\common\trdp_pdcom.c	TRDP light PD functionality
..\src\common\trdp_pdcom.h	TRDP light PD functionality definitions
..\src\common\trdp_private.h	TRDP light private definitions
..\src\common\trdp_stats.c	TRDP light statistics functionality
..\src\common\trdp_stats.h	TRDP light statistics functionality definitions
..\src\common\trdp_utils.c	TRDP light utilities
..\src\common\trdp_utils.h	TRDP light MD utilities definitions
..\src\vos\api\vos_mem.h	VOS memory management functionality definitions
..\src\vos\api\vos_shared_mem.h	VOS shared memory management functionality definitions
..\src\vos\api\vos_sock.h	VOS IP network and socket management functionality definitions
..\src\vos\api\vos_thread.h	VOS thread and timer management functionality definitions
..\src\vos\api\vos_types.h	VOS type definitions
..\src\vos\api\vos_utils.h	VOS utility definitions

File	Description
..\src\vos\common\vos_mem.c	VOS memory management functionality
..\src\vos\common\utils.c	VOS utilities
..\src\vos\posix\vos_private.h	VOS private definitions
..\src\vos\posix\vos_shared_mem.c	VOS shared memory management functionality
..\src\vos\posix\vos_sock.c	VOS IP network and socket management functionality
..\src\vos\posix\vos_thread.c	VOS thread and timer management functionality
..\src\vos\windows\private.h	VOS private definitions
..\src\vos\windows\vos_shared_mem.c	VOS shared memory management functionality
..\src\vos\windows\vos_sock.c	VOS IP network and socket management functionality
..\src\vos\windows\vos_thread.c	VOS thread and timer management functionality

Table 11: SDK Delivery Content - TRDPLight

3.2.2. TRDPMarshall

The TRDPMarshall contains the marshalling/un-marshalling functionality.

File	Description
..\src\common\tau_marshall.c	Marshalling/un-marshalling functionality
..\src\api\tau;marshall.h	Marshalling/un-marshalling definitions

Table 12: SDK Delivery Content - TRDPMarshall

3.2.3. TRDPXML

The TRDPXML contains the functionality for reading TRDP XML configuration files.

NOTE: This source code needs the resources iconv and libxml.

File	Description
..\src\common\tau_xml.c	Read TRDP XML configuration functionality
..\src\api\tau_xml.h	Read TRDP XML configuration definitions
..\src\api\trdp-config.xsd	TRDP configuration XML schema

Table 13: SDK Delivery Content – TRDPXML

3.2.4. TRDPSpy

The TRDPSpy contains the wireshark plugin for interpreting TRDP telegrams.

NOTE: The source code needs the resources iconv and libxml.

File	Description
..\spy\linux32\packet-trdp_spy.so	Linux32 Wireshark plugin
..\spy\linux32\trdp_spy.dll	Win32 Wireshark plugin
..\spy\win32\libxml2.dll	Resources for Win32 Wireshark plugin
..\spy\win32\iconv.dll	Resources for Win32 Wireshark plugin
..\spy\win32\readme.txt	Readme for Win32 Wireshark plugin
..\spy\src\ INSTALL.txt	Installation guide for Wireshark plugin SDK
..\spy\src\trdp_spy\README.txt	Build instruction
..\spy\src\trdp_spy\plugin.rc.in	
..\spy\src\trdp_spy\plugin.c	
..\spy\src\trdp_spy\parsebody.h	
..\spy\src\trdp_spy\parsebody.c	
..\spy\src\trdp_spy\packet-trdp_spy.h	
..\spy\src\trdp_spy\packet-trdp_spy.c	
..\spy\src\trdp_spy\moduleinfo.nmake	
..\spy\src\trdp_spy\moduleinfo.h	
..\spy\src\trdp_spy\Makefile.nmake	
..\spy\src\trdp_spy\Makefile.common	
..\spy\src\trdp_spy\Makefile.am	
..\spy\src\trdp_spy\Makefile	
..\spy\src\trdp_spy\CMakeLists.txt	
..\spy\src\trdp_spy\clean.bat	
..\spy\src\trdp_spy\build.sh	
..\spy\src\trdp_spy\build.bat	

Table 14: SDK Delivery Content - TRDPSpy

3.2.5. Resources

The following open source resources are needed for the below described functionality of the TRDP library are included in the delivery.

File	Description
..\resources\windows\getopt*	Windows getopt implementation for testing
..\resources\windows\iconv*	Iconv for XML configuration interpretation
..\resources\windows\libxml*	Libxml for XML configuration interpretation
..\resources\windows\pthread*	Posix thread implementation for Windows for VOS
..\resources\windows\wireshark*	Wireshark 1.8.3 for TRDP Spy

Table 15: SDK Delivery Content – Resources

3.2.6. Build Environment

The following files for the build environment are included in the delivery.

File	Description
..\makefile	Makefile for TRDP Light
..\readme-makefile.txt	Makefile configuration instruction
..\config\ buildsettings_posix_TEMPLATE	Makefile configuration settings
..\VisualC*	VisualC 2010 configuration files to build the TRDP library as well as the different test applications.
..\Xcode*	XCode configuration files to build the TRDP library as well as the different test applications.

Table 16: SDK Delivery Content – Build Environment

3.2.7. Tests

The following test programs are included in the delivery.

File	Description
..\test\diverse*	Diverse tests for TRDP library
..\test\lint*	PCLint 8.0.w configuration for Windows and Linux
..\test\marshalling*	Marshalling test
..\test\mdpatterns*	MD pattern tests
..\test\pdpatterns*	PD pattern tests
..\test\udpmdcom*	UDP MD communication test
..\test\xml*	XML configuration test
..\test\laddermdtest*	Ladder MD test
..\test\ladderpdtest*	Ladder PD test

Table 17: SDK Delivery Content - Tests

3.2.8. Examples

The following example programs are included in the delivery.

File	Description
..\example\example.xml	TRDP example configuration
..\example\echoPolling.c	PD polling example
..\example\echoSelect.c	PD select example
..\example\echoSelectCmdLine.c	PD select example
..\example mdManager.c	UDP MD example
..\example\mdManagerTCP.c	TCP MD example
..\example\receiveHello.c	PD receive example
..\example\sendHello.c	PD send example
..\example\ladder\ladderApplication.c	Ladder application example

Table 18: SDK Delivery Content - Examples

3.3. Documentation

The following documents are related to the delivered product and part of the delivery.

#	Ducument	Revision	Identification
1	TRDP License Agreeement	02	TCN-TRDP1-C-BOM-029
2	TRDP Coding Rules	07	TCN-TRDP1-A-BOM-008
3	TRDP System Requirement Specification	09	TCN-TRDP1-D-BOM-003
4	TRDP Architecture & Design	01	TCN-TRDP2-D-BOM-019
5	TRDP Conformance Test Specification	02	TCN-TRDP2-D-BOM-031
6	TRDP Conformance Test Report	01	TCN-TRDP2-D-BOM-032
7	TRDP User's Manual	19	TCN-TRDP2-D-BOM-011
8	TRDP Reference Manual	01	TCN-TRDP2-D-BOM-033

Table 19: SDK Delivery Content - Documentation

3.4. Restrictions

None

4. Installation

4.1. Platform

Version 1.0.0.0 does not contain ready made libraries or DLL (except for TRDP SPY) but only the SDK including the build environment configurations.

4.2. SDK

1. Unpack the file "TCNOpenTRDP 1.0.0.0.zip" into your development work area.
2. Check the files in src/vos for targets which suites your target
3. Edit the Makefile by adding or changing your configuration.
4. For windows environments, open the VisualC/Win32TRDP_VS2010.sln file with MS Visual Studio 2010.

.
All source files/libraries/executables can be found in the folders described in chapter 3.2.

5. How to use

5.1. Linux

Adapt the delivered configuration for the makefile and compile the TRDP library.

5.2. VxWorks

Not yet supported.

5.3. Windows

Adapt and use the delivered VisualC 2010 configuration and compile the TRDP library.

6. Changes

The following PRs (Problem Report) and NCRs (Non Conformity Reports) have been corrected since the previous release. Column '*PR no.*' contains the PR number, if a PR exists.

6.1. TRDPLight

6.1.1. Corrected Errors

CR	Description
None – first release	

Table 20: Corrected Errors TRDPLight

6.1.2. New or Enhanced Functions

CR	Description
None – first release	

Table 21: New or enhanced functions TRDPLight

6.1.3. Known Errors

CR	Description
#25	vos_shared_mem.c - WIN32 implementation missing
#30	For performance reasons a un-join shall be done after unsubscribing.
#57	vos_thread.c mailbox implementation missing (functionality not used in TRDPLight)
#97	For call/reply/confirm to multicast address and unknown number of repliers there is no callback received (after timeout) with the number of received replies.
#103	When Caller sends Mr resulted in ReplyTimeout, the Caller does not retry to send Mr.
#113	When TCP MD request is sent to non existing listener stack invokes callback with TRDP_TIMEOUT_ERR and without application caller reference (pUserRef = 0).
#114	When a caller sends Request with 2 for Repliers number but only one replyer replies, TRDP does not call back with the second replyer's Reply Time-out.

Table 22: Known Errors TRDPLight

6.1.4. Compatibility to Earlier Releases

First release.

6.2. TRDPMarshall

6.2.1. Corrected Errors

CR	Description
None – first release	

Table 23: Corrected Errors TRDPMarshall

6.2.2. New or Enhanced Functions

CR	Description
None – first release	

Table 24: New or enhanced functions TRDPMarshall

6.2.3. Known Errors

CR	Description
None	

Table 25: Known Errors TRDPMarshall

6.2.4. Compatibility to Earlier Releases

First release.

6.3. TRDPXML

6.3.1. Corrected Errors

CR	Description
None – first release	

Table 26: Corrected Errors TRDPXML

6.3.2. New or Enhanced Functions

CR	Description
None – first release	

Table 27: New or enhanced functions TRDPXML

6.3.3. Known Errors

CR	Description
#64	TRDPXML does not yet support mapped devices

Table 28: Known Errors TRDPXML

6.3.4. Compatibility to Earlier Releases

First release.

6.4. TRDPSpy

6.4.1. Corrected Errors

CR	Description
None – first release	

Table 29: Corrected Errors TRDPSpy

6.4.2. New or Enhanced Functions

CR	Description
None – first release	

Table 30: New or enhanced functions TRDPSpy

6.4.3. Known Errors

CR	Description
None	

Table 31: Known Errors TRDPSpy

6.4.4. Compatibility to Earlier Releases

First release.

7. History

First release.

8. Problem reporting

Detected problems with this release are to be reported to:
armin-hagen.weiss@de.transport.bombardier.com